Data Collection Field to Finish: How Sharp is Your Field Pencil?

Carlson™

BREAK NEW GROUND

2021 Surveyors Conference

Presented By

Ladd Nelson
Sales Director - Midwest Region
Carlson Software
563-583-8552 (o)
402-321-6638 (m)
lnelson@carlsonsw.com

For the Surveyor…

It’s An Artist’s World!

Discussion Topics

- Feature Code Library (FCL) and Special Codes
- Different Job Settings (NAD83, UTM, etc)
- SurvPC vs. SurvCE, longevity of Windows Mobile
- NGS Control - https://www.ngs.noaa.gov/cgi-bin/ds_mark.prl?PidBox=DP8512
- Spacing of Data, make it uniform
- National CAD Standards
- ftp://ftp.dot.wi.gov/dtsd/bpd/methods/survey/
- One shot, multiple lines
- Edit-Process Raw Data
- Data at https://www.dropbox.com/sh/ojdujdk117nsmgw/AAAxIEDlGq3TsTBjelaoLnlFa?dl=0

Don’t be “Boy Blunder”!

Project Location

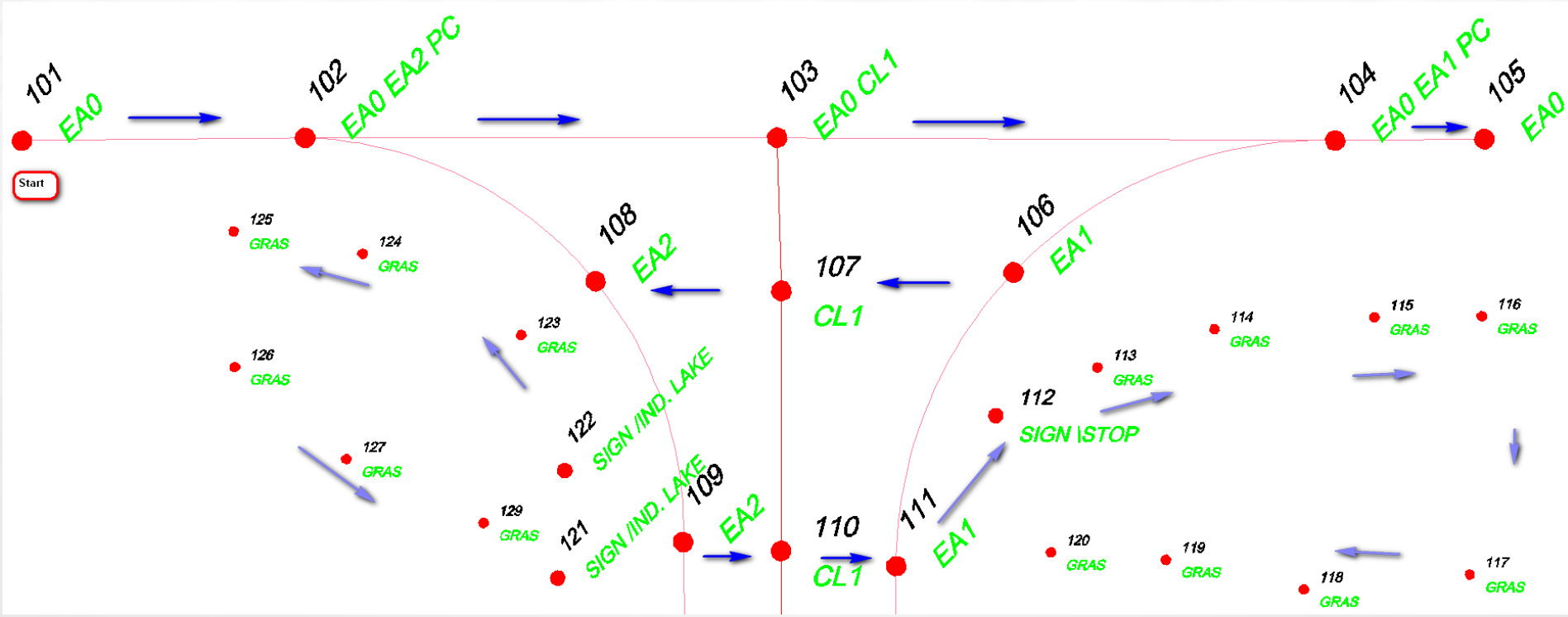
- Indian Lake County Park, Dane Co, WI
- Selected because it is open and public area
- Long entrance suitable for roadway example
- Parking lot with islands for grading example
- Happens to have published GPS Control
- Typical meeting location of Madison-area Surveyors Summer Picnic

The Overall Project…

Carlson™

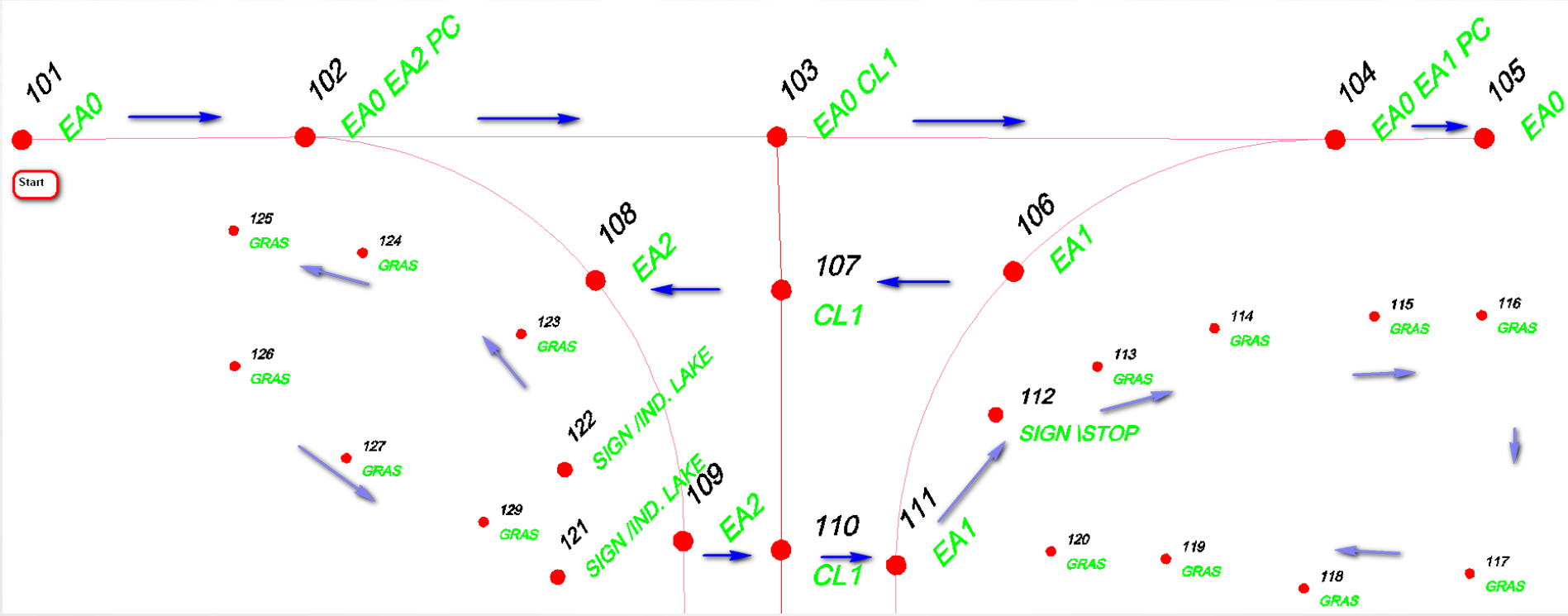
Roads – Meta Data

- NAD83, WI South – Specified because DOT projects might span across County lines
- Date Gathered:
  - 10-02-2017 -- 11:19:02 thru 18:06:02
  - 10-03-2017 -- 10:02:45 thru 10:21:40
- Point Range:
  - 101 – 957
  - 958 – 999
- "Hindsight" Issues
  - Lack of familiarity with suggested WI DOT Codes
  - "Lengthy" Codes
  - 25' Paced Spacing

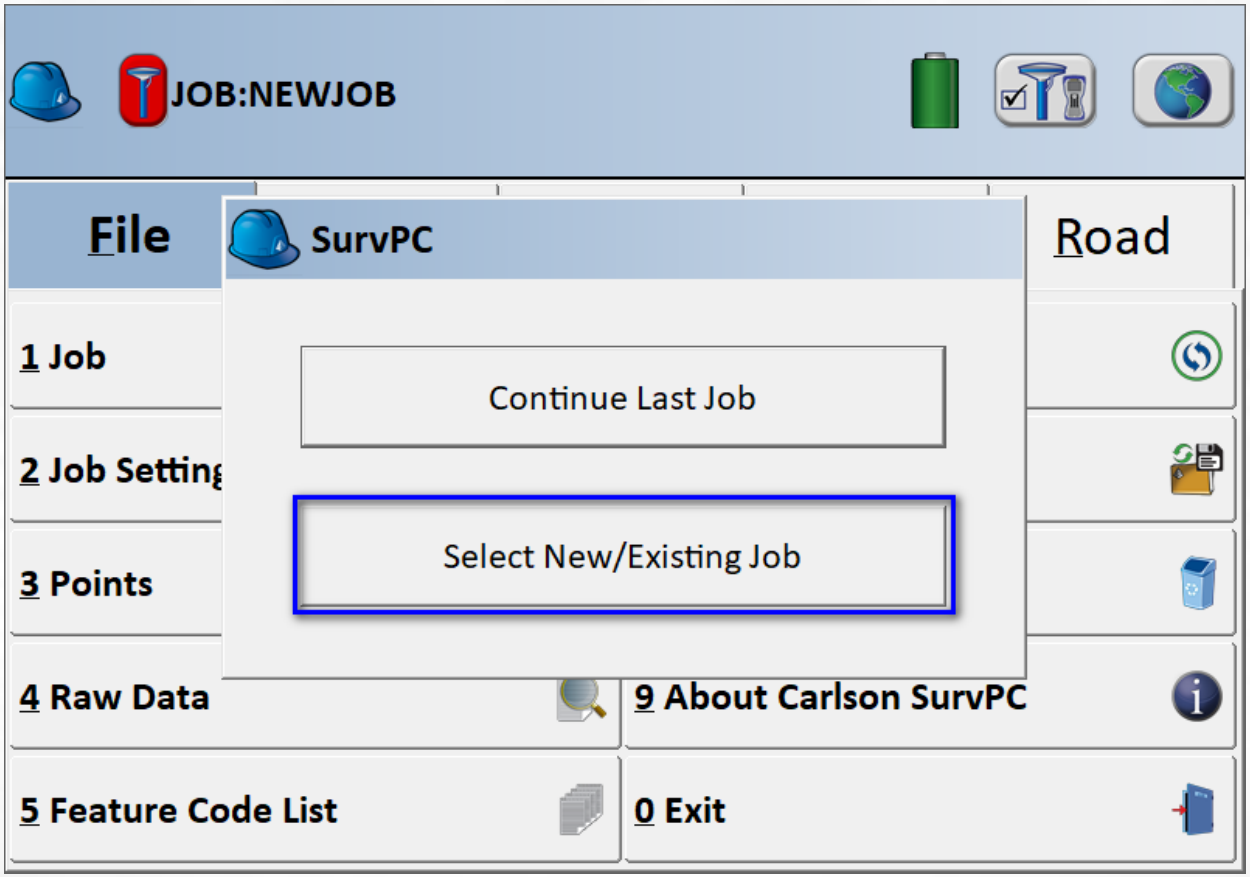


Roads – Collection Notes

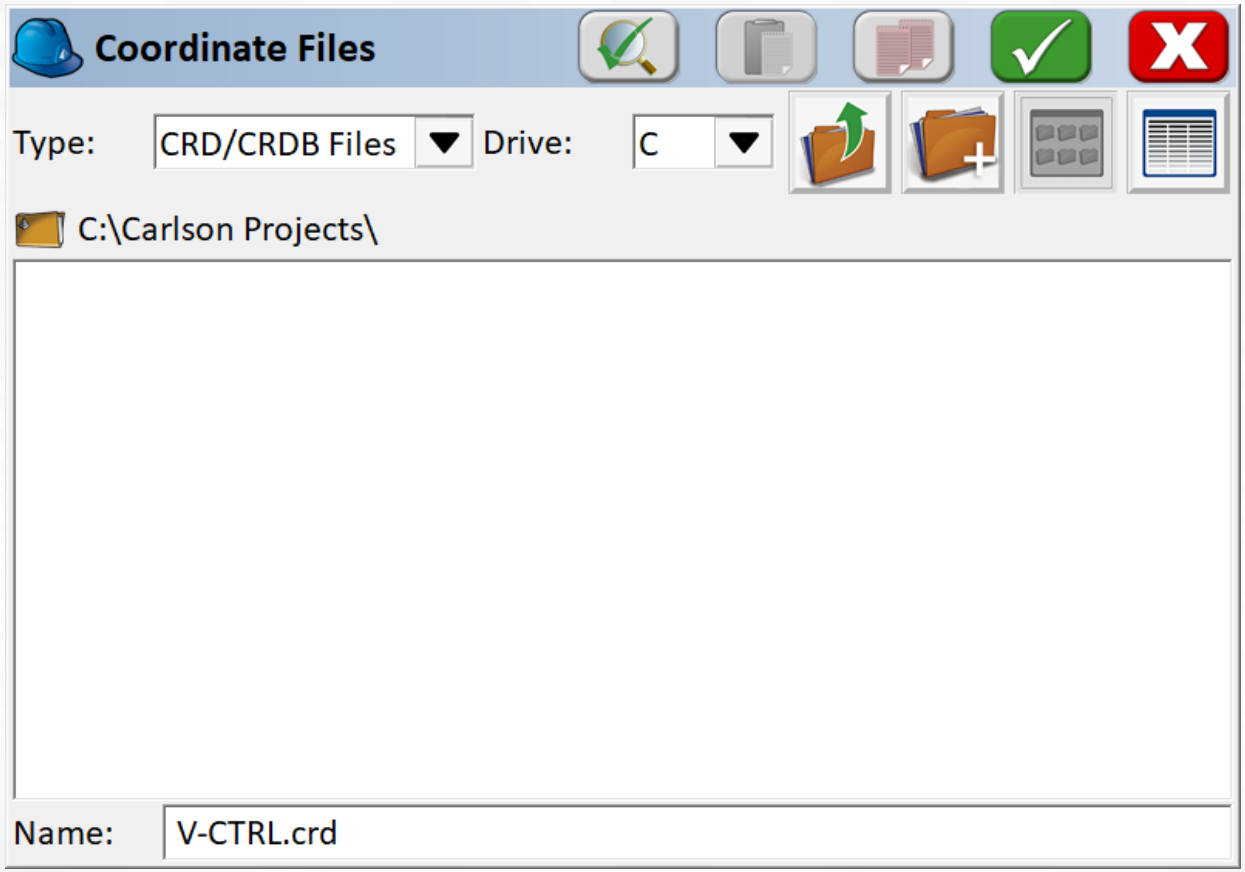
- 102 & 104: Single shot for line “0” at lines 2 and 1 (respectively) that also define a PC
- 103: Single shot for line “0” at centerline 1
- Roadway cross-sectioning pattern in effect
- 109 & 111: Unless explicitly provided, SurvPC can assume the third shot to be a PT for a 3-point arc
- Filled in the grass areas with random shots with the intent to make a pleasing looking surface model



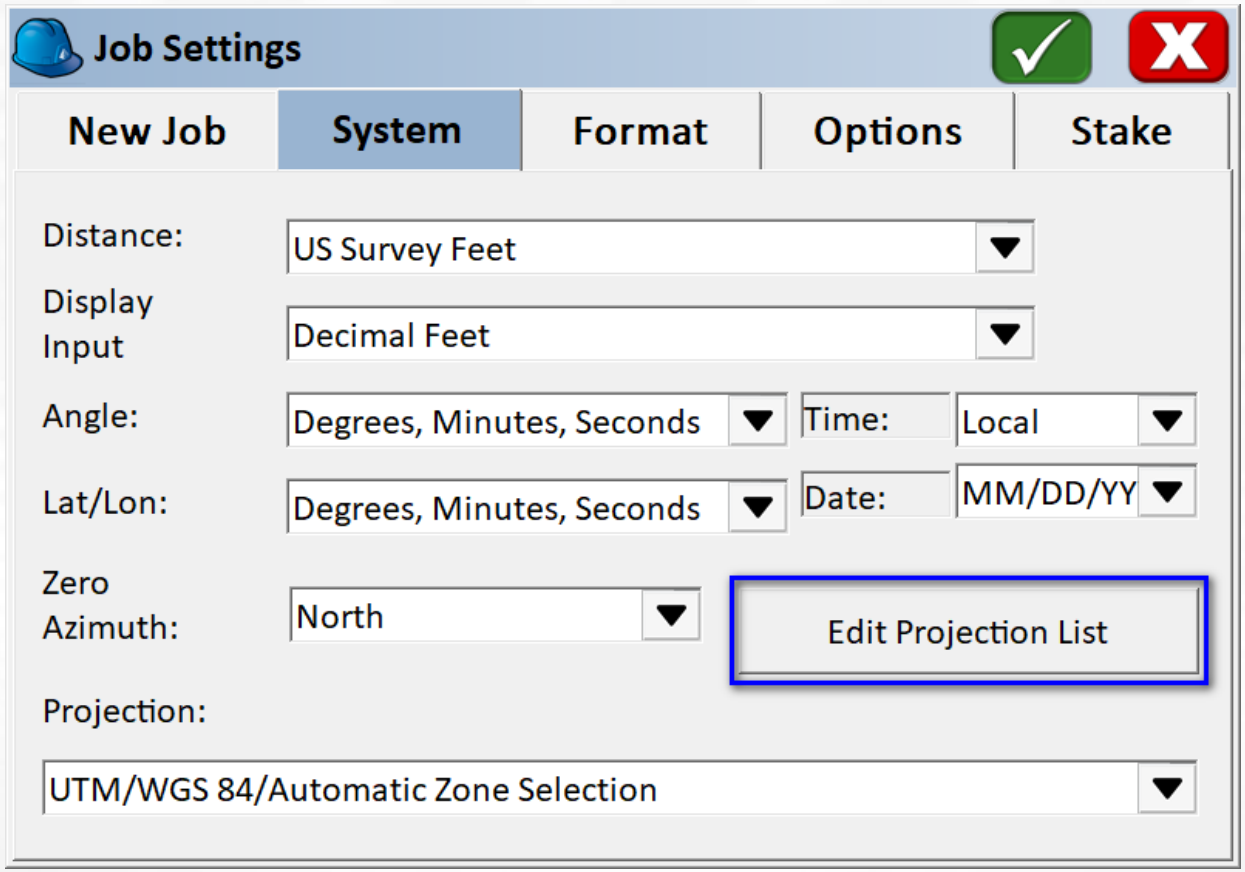
Roads – Step by Step



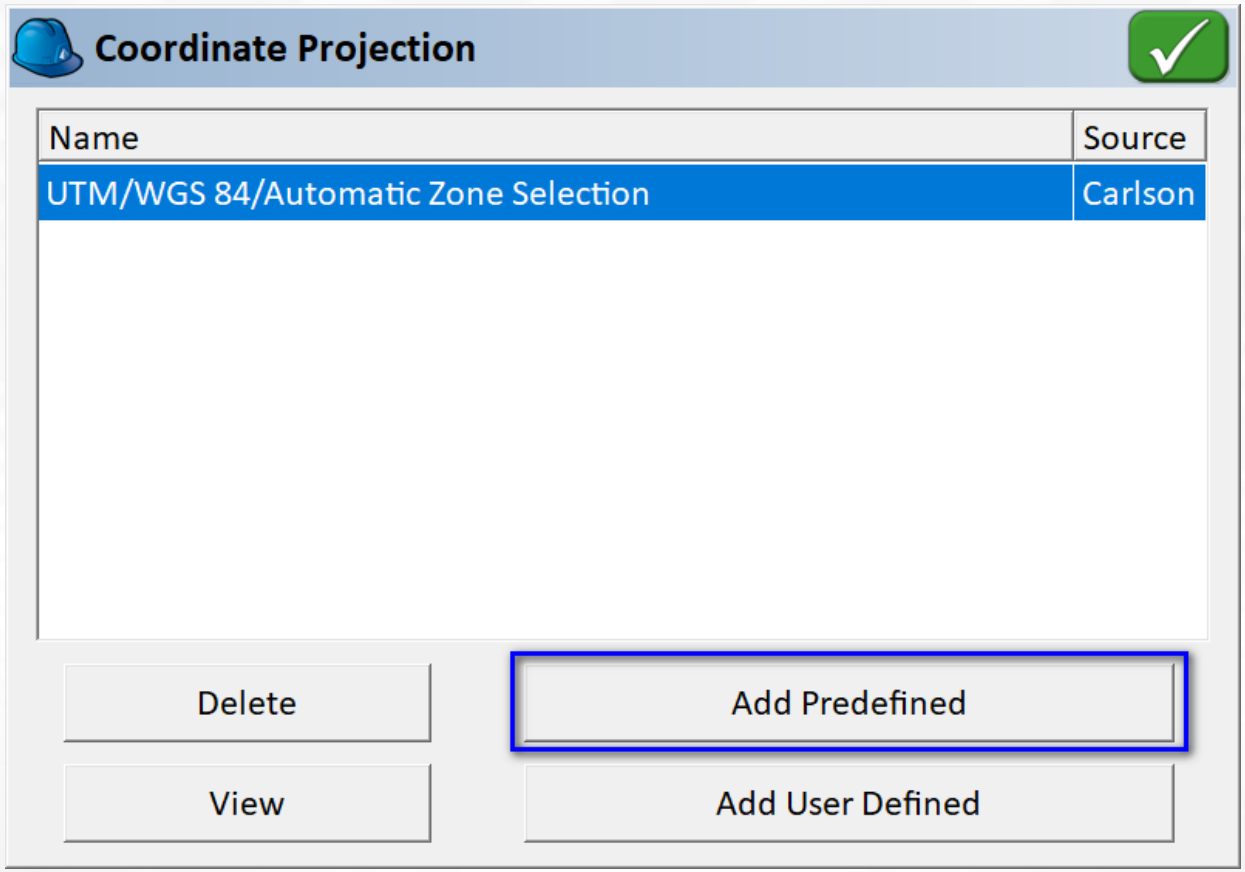
Roads – Step by Step



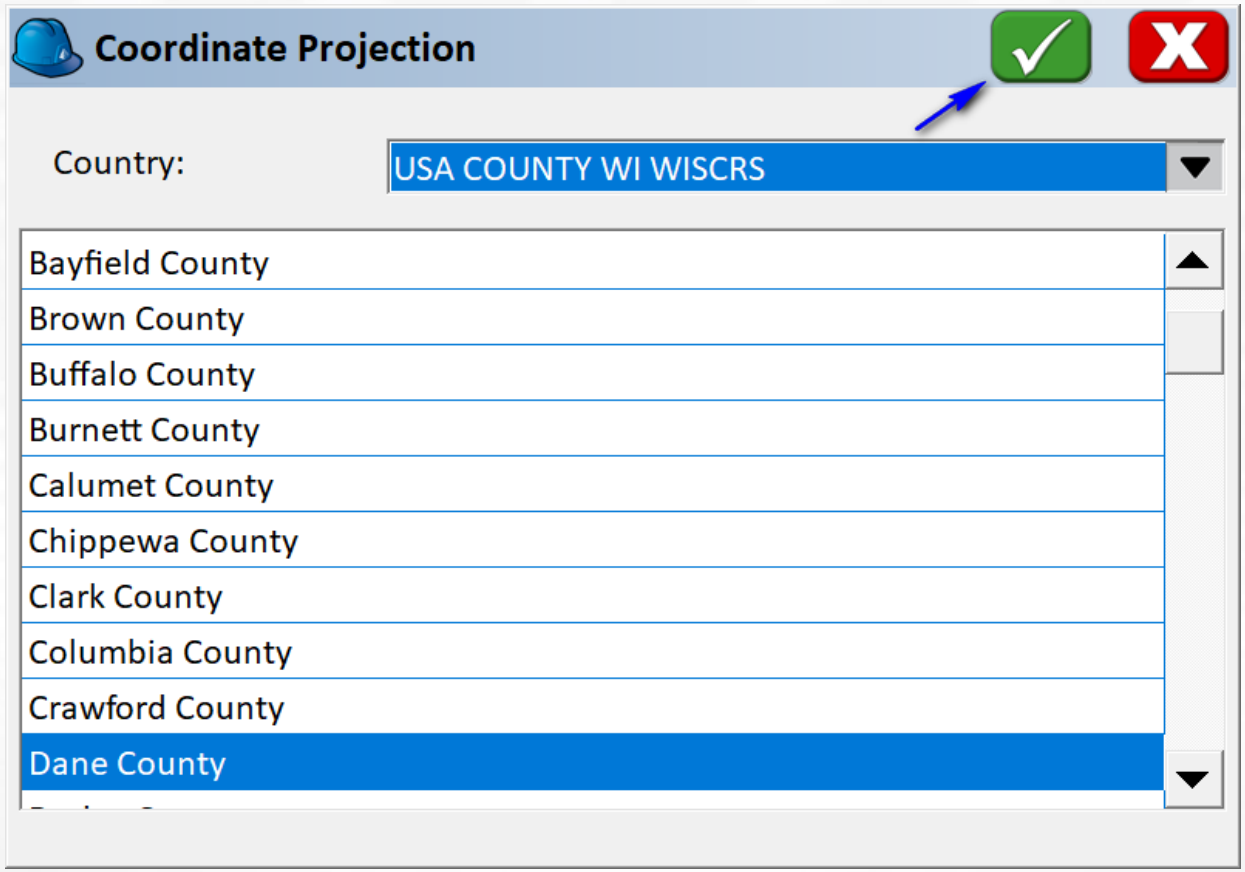
Roads – Step by Step



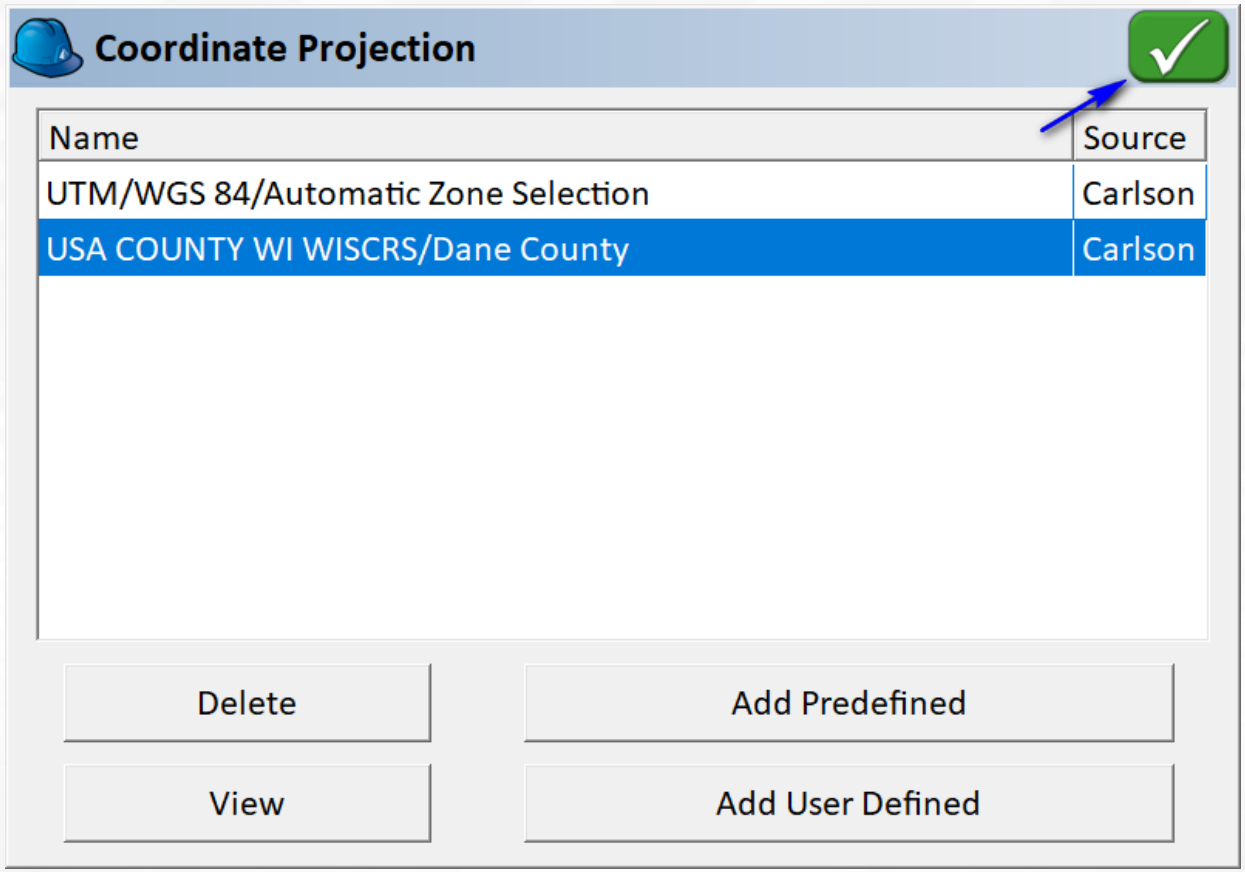
Roads – Step by Step



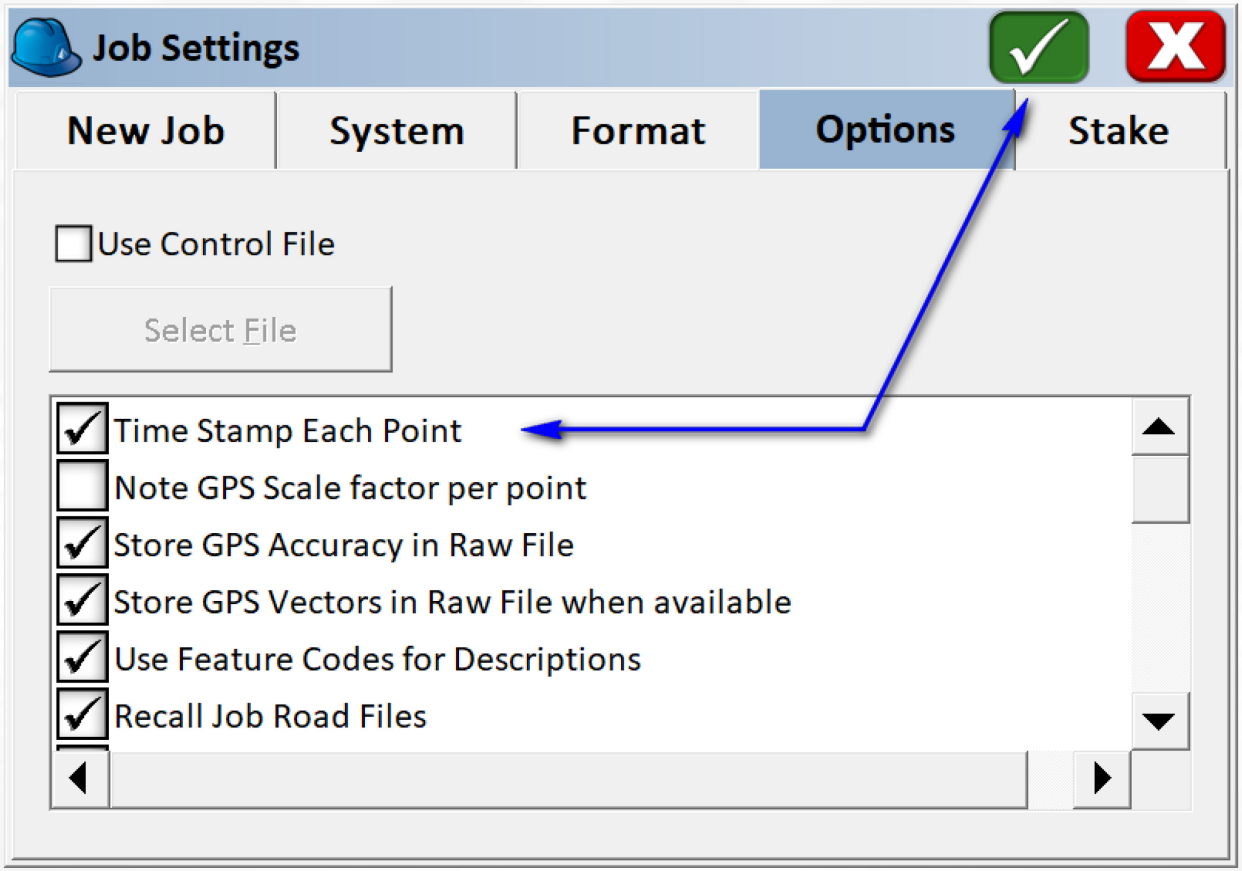
Roads – Step by Step



Roads – Step by Step

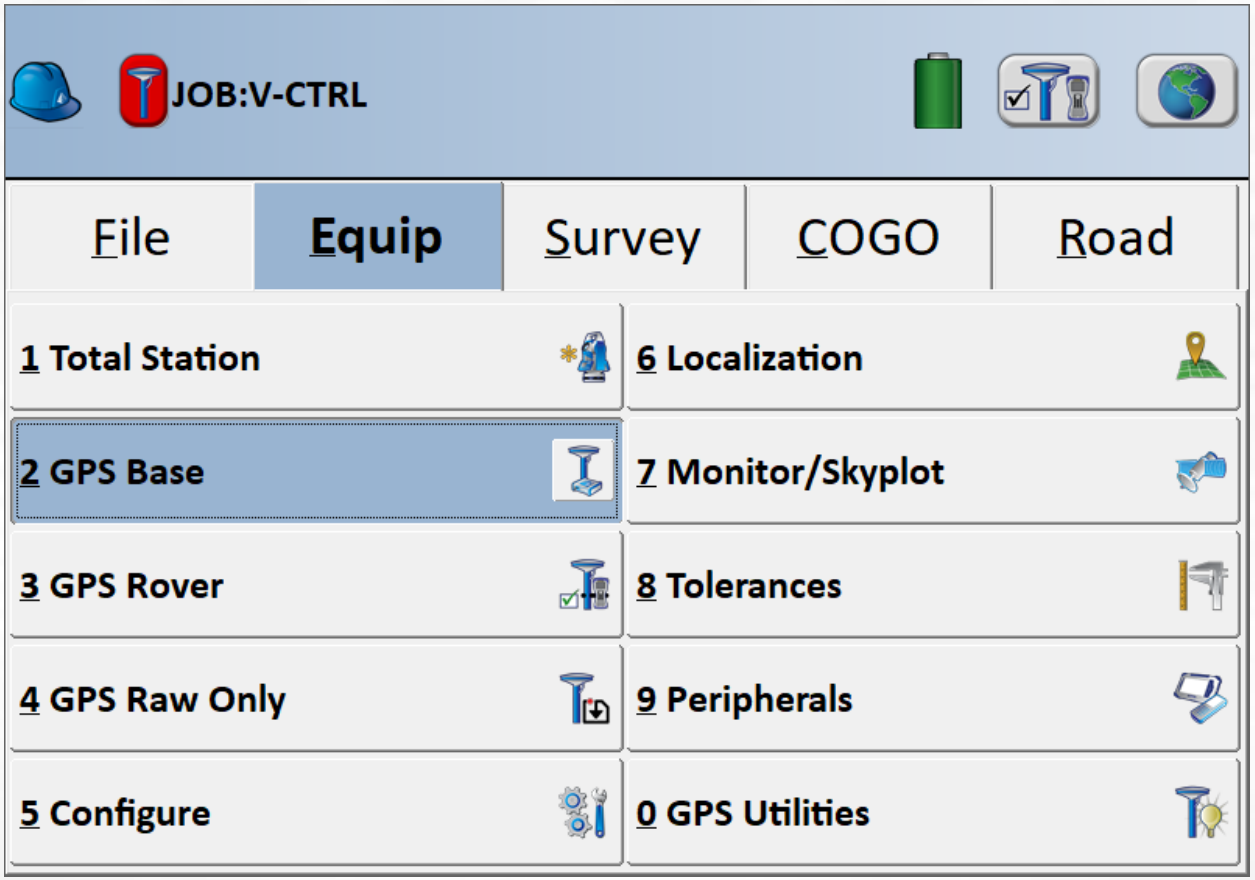


Roads – Step by Step

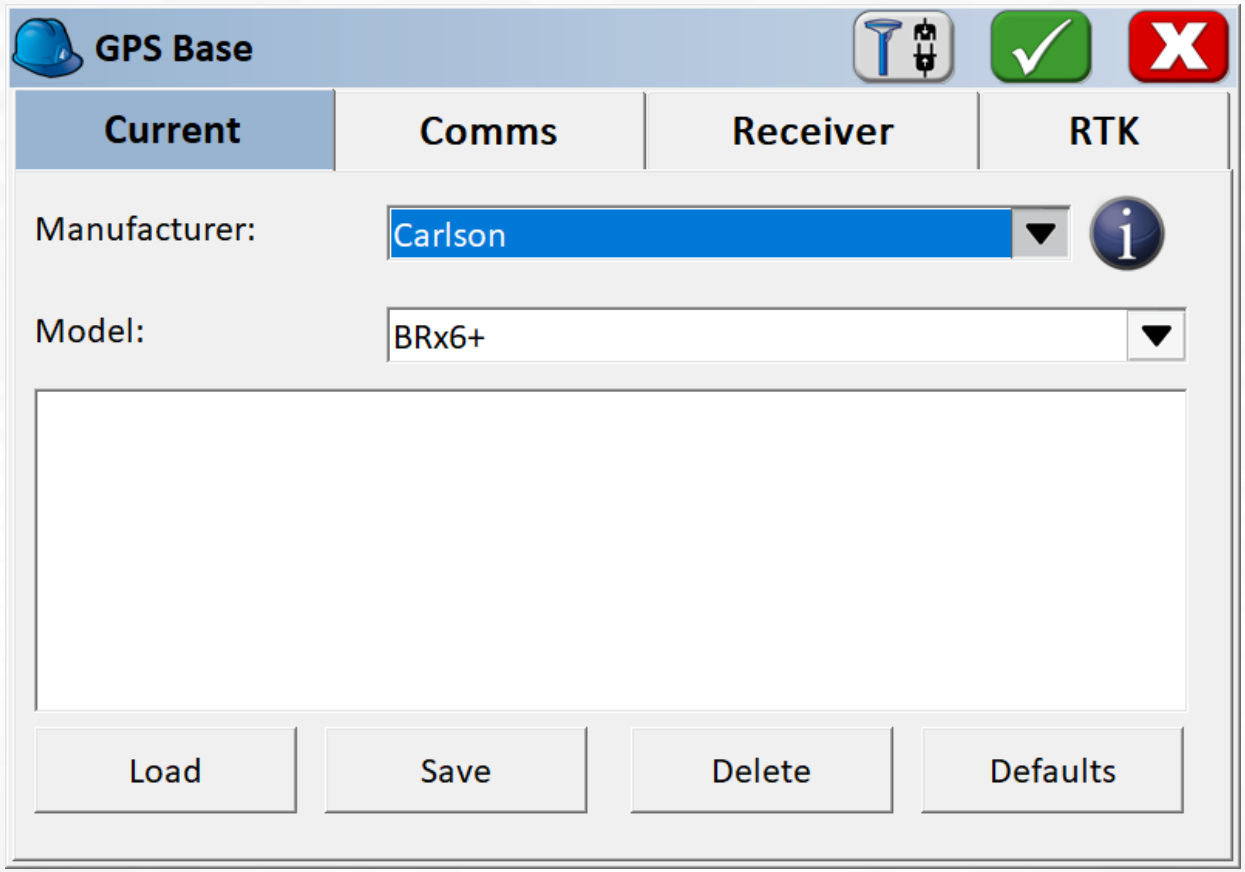


Roads – Step by Step

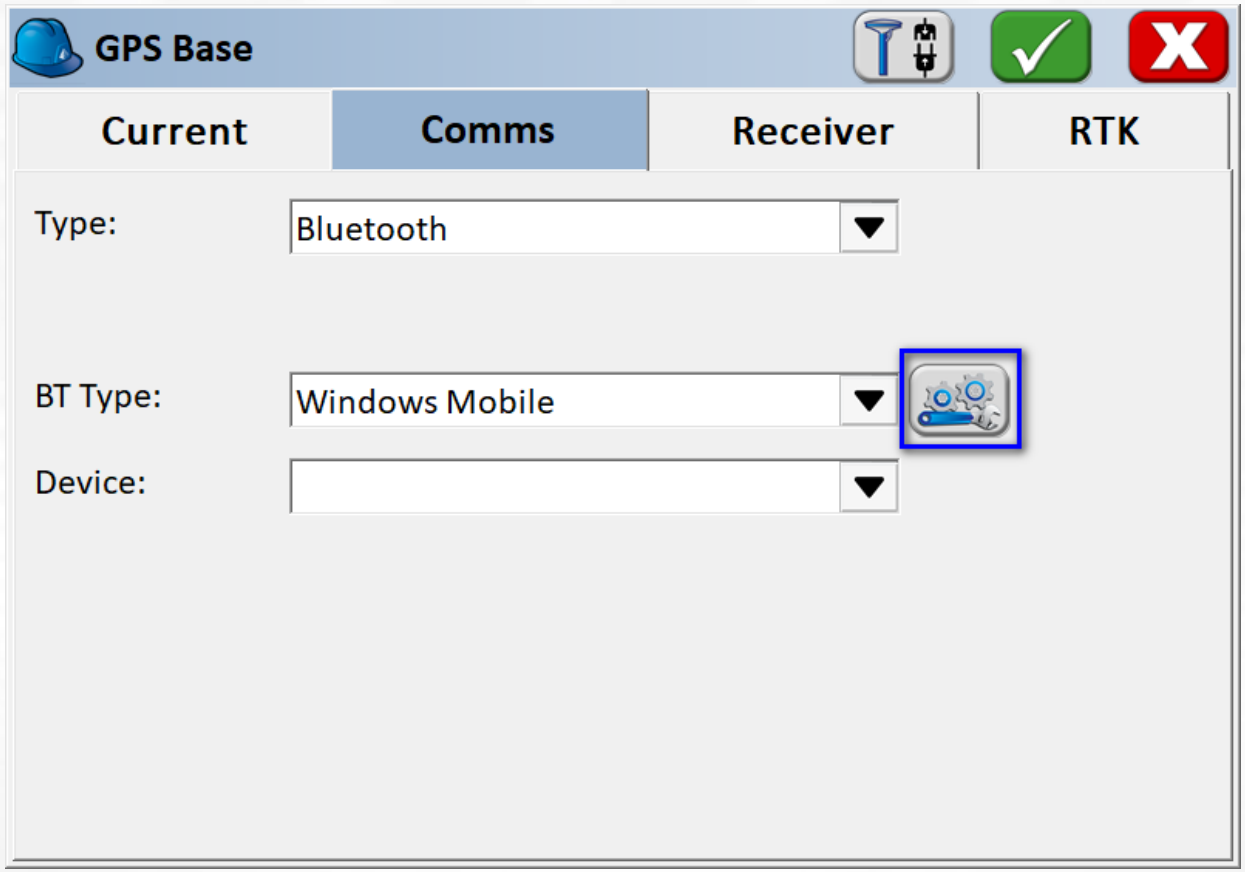
Roads – Step by Step



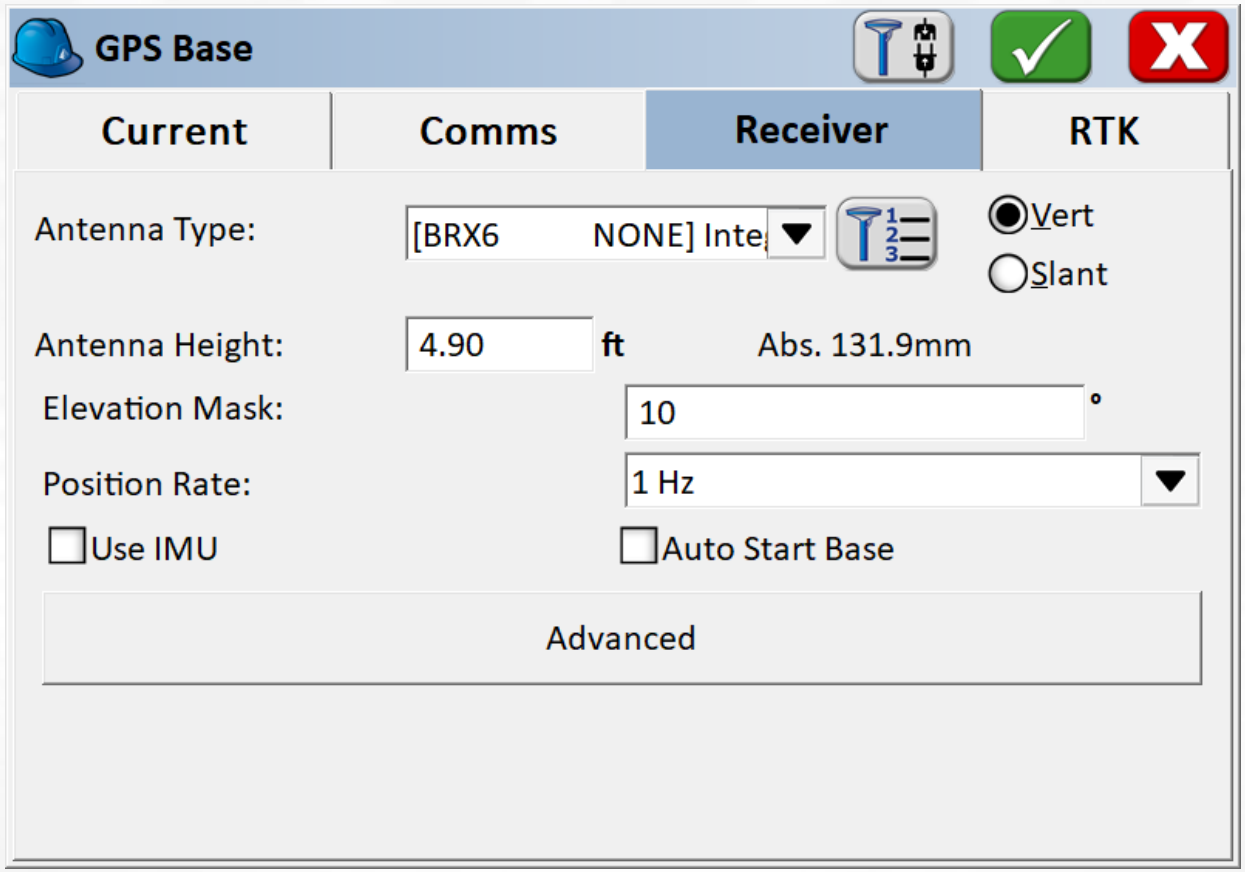
Roads – Step by Step



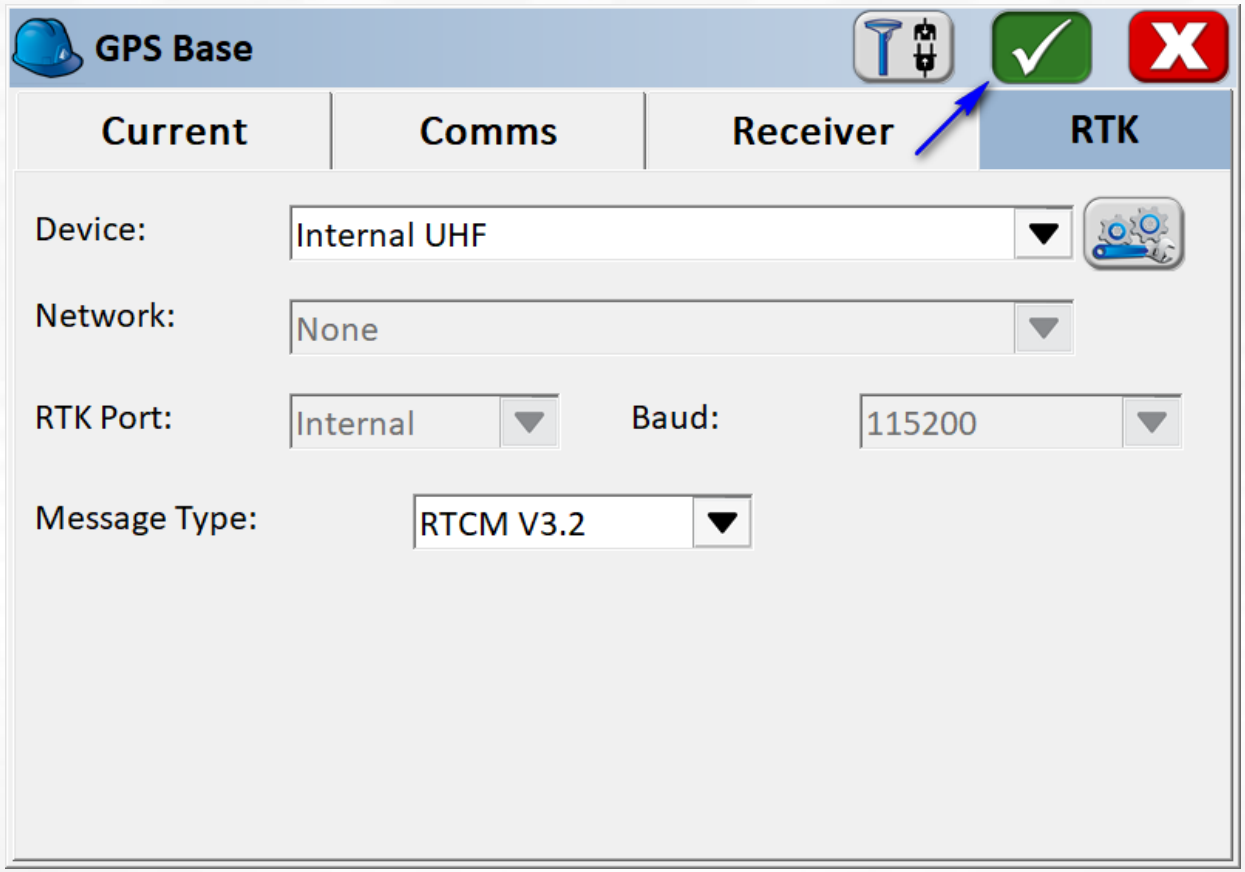
Roads – Step by Step



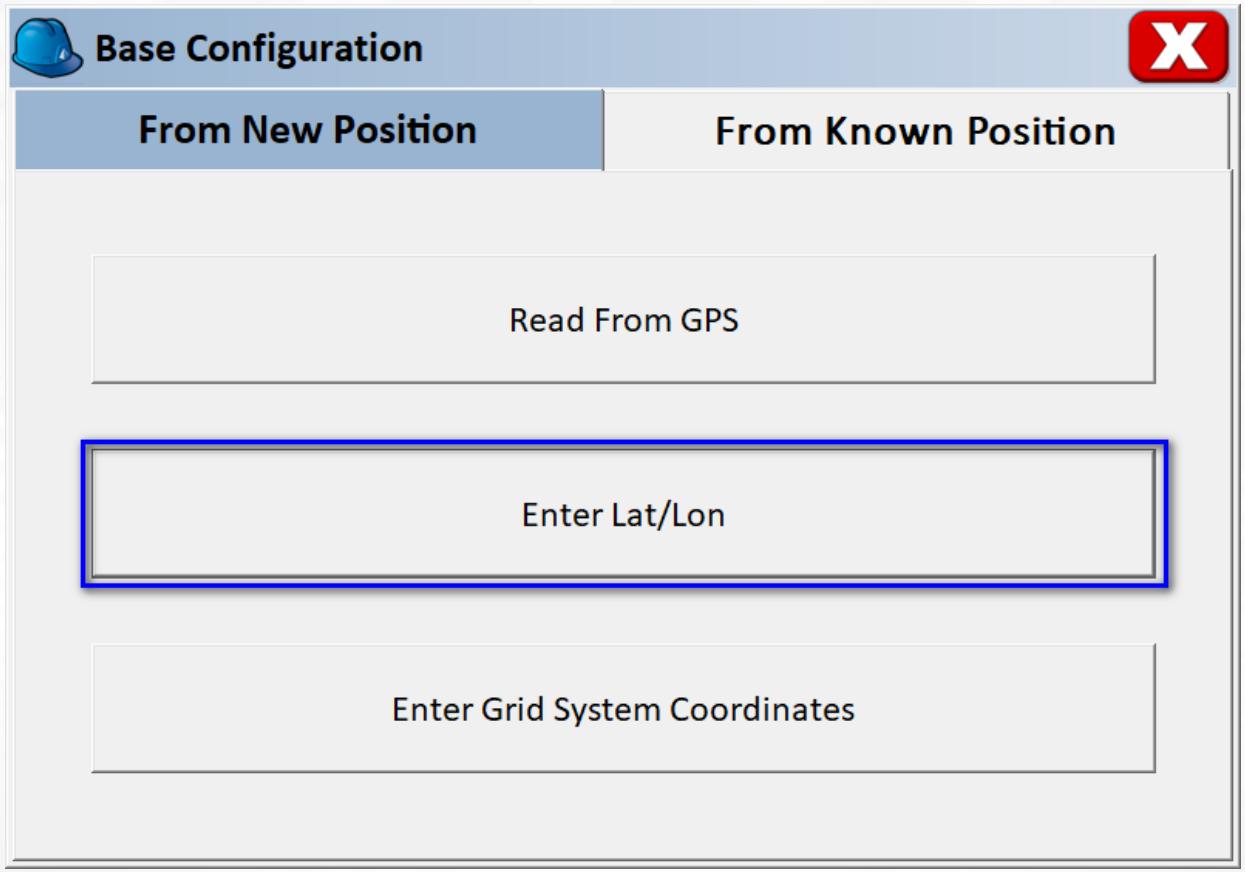
Roads – Step by Step



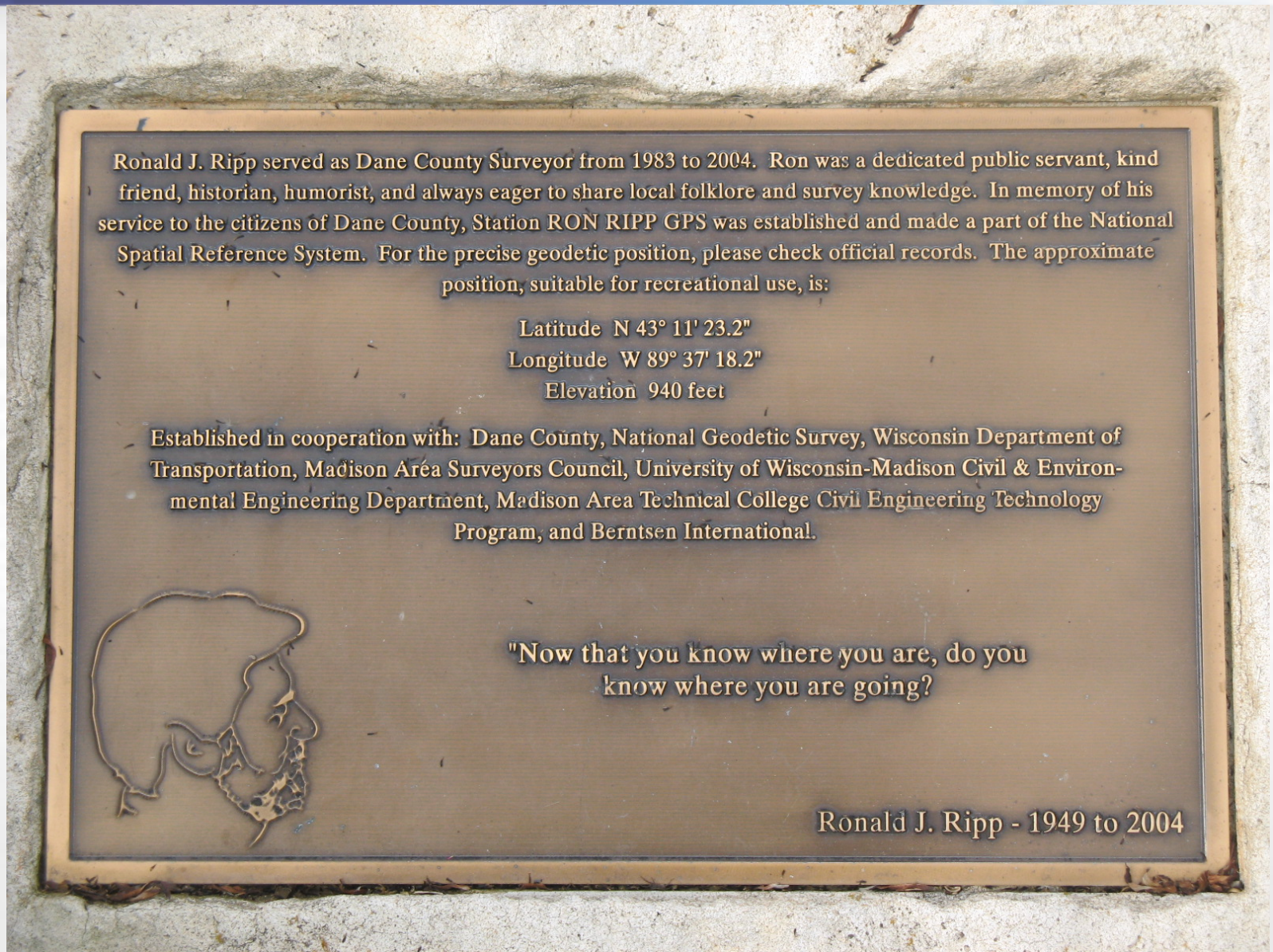
Roads – Step by Step



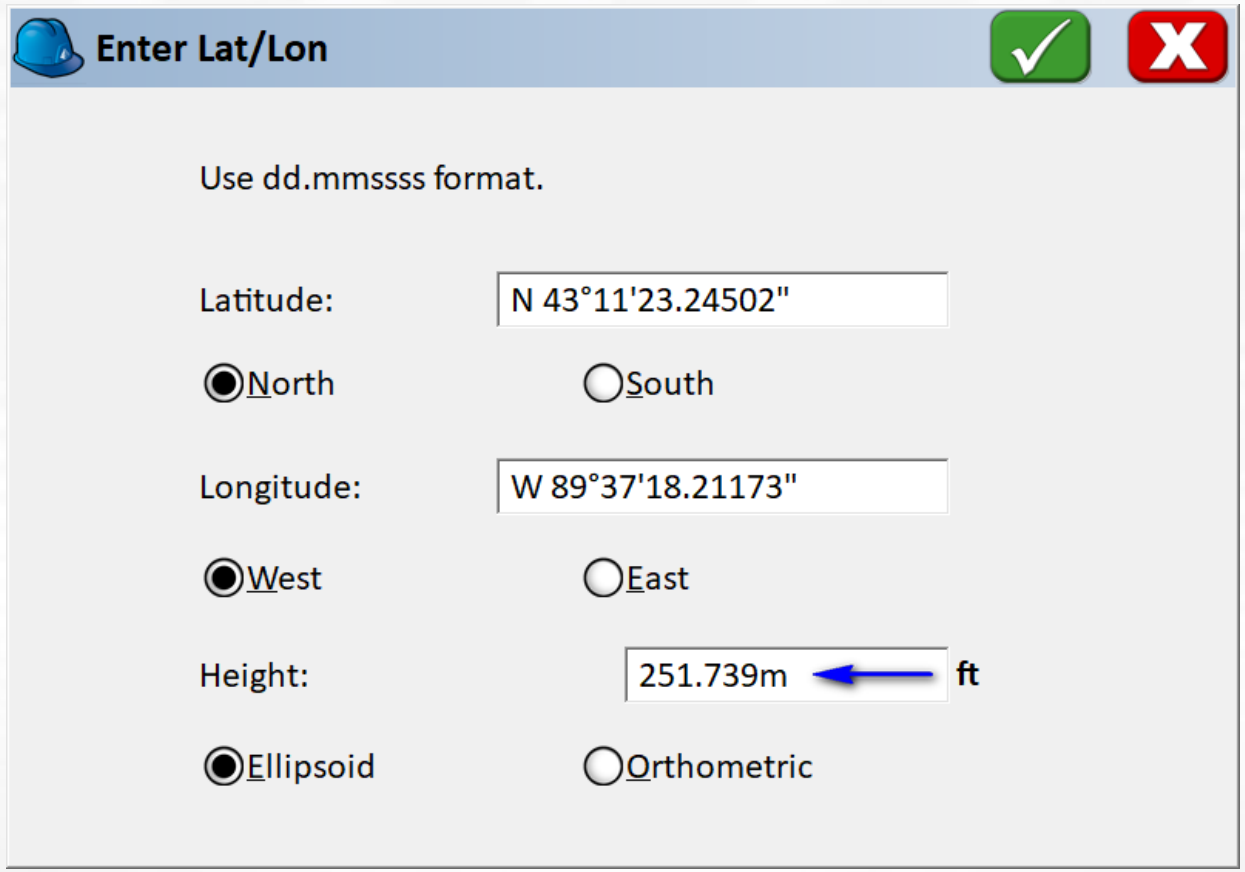
Roads – Step by Step



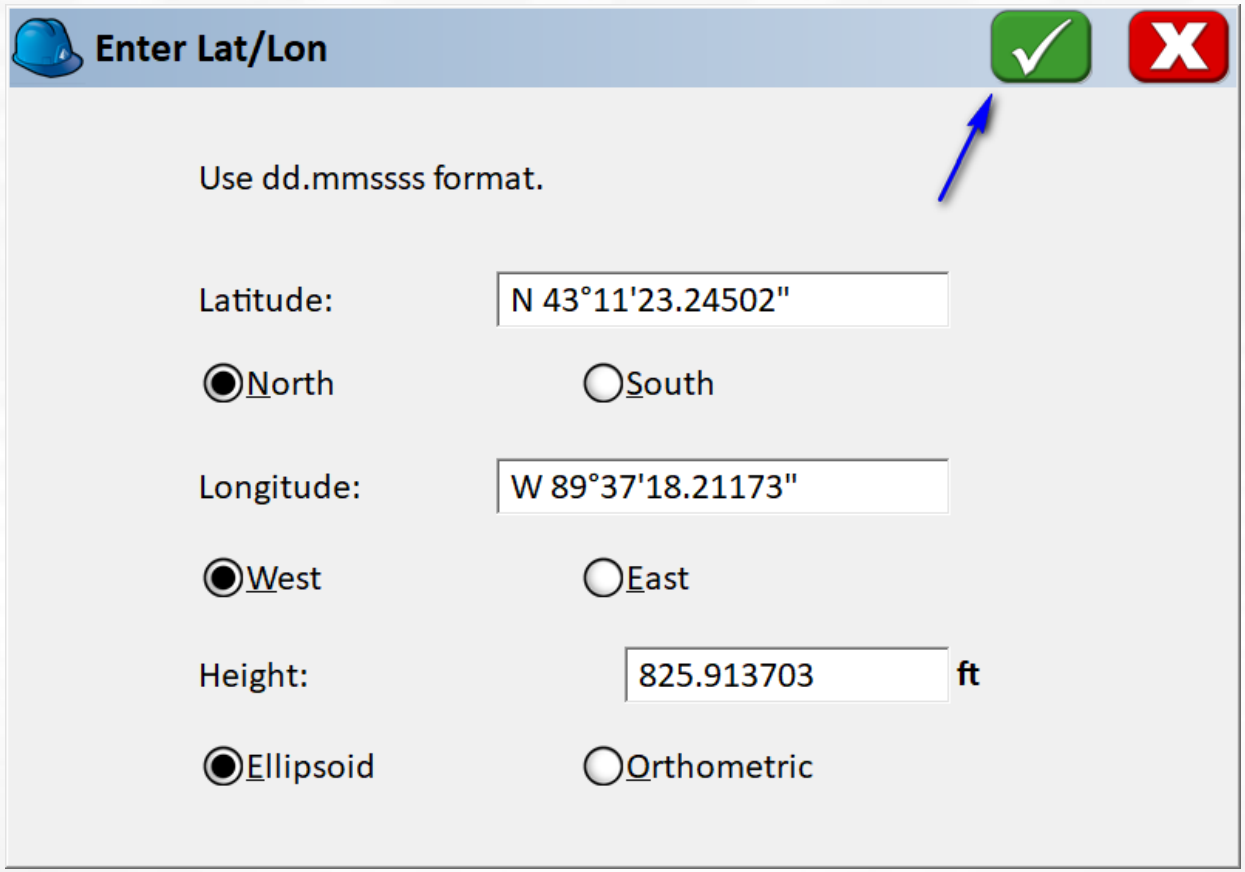
Roads – Step by Step



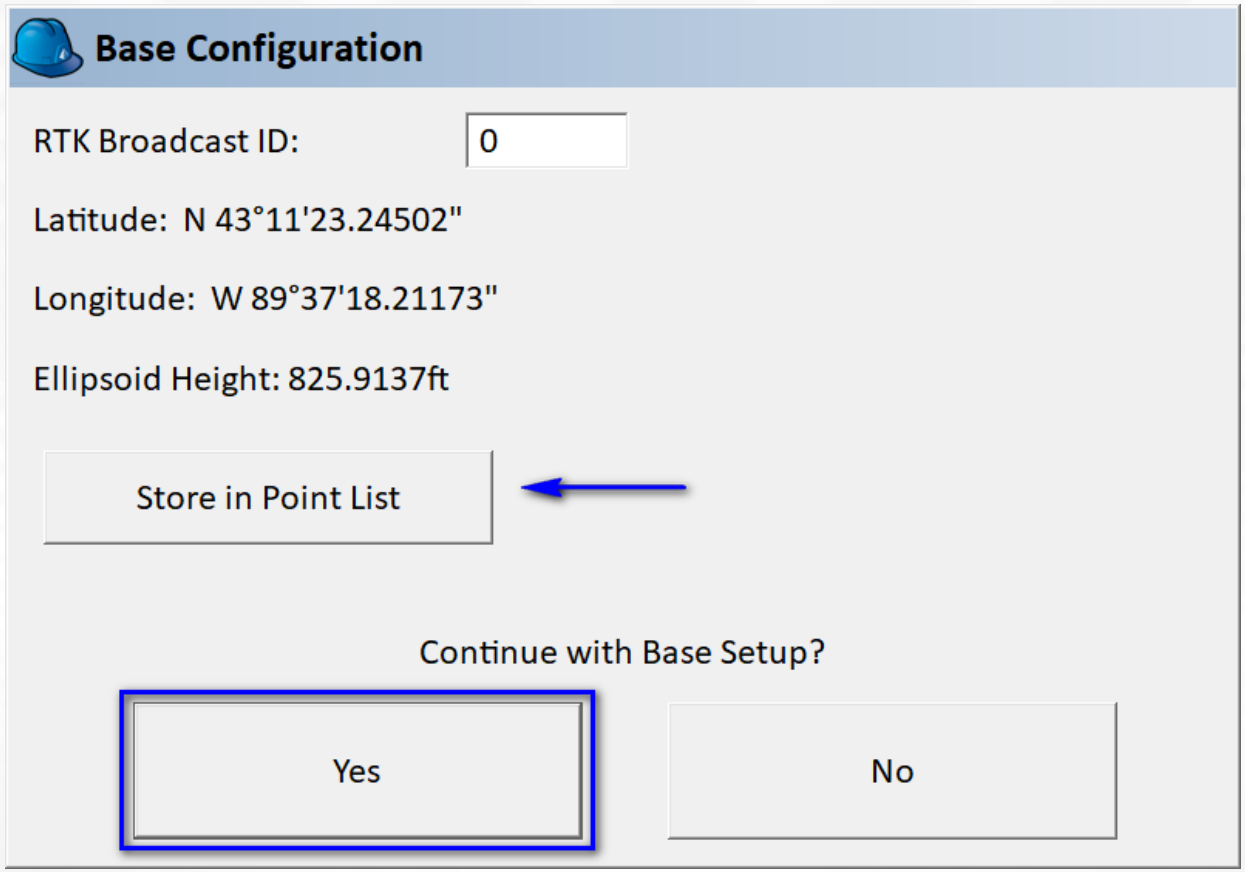
Roads – Step by Step



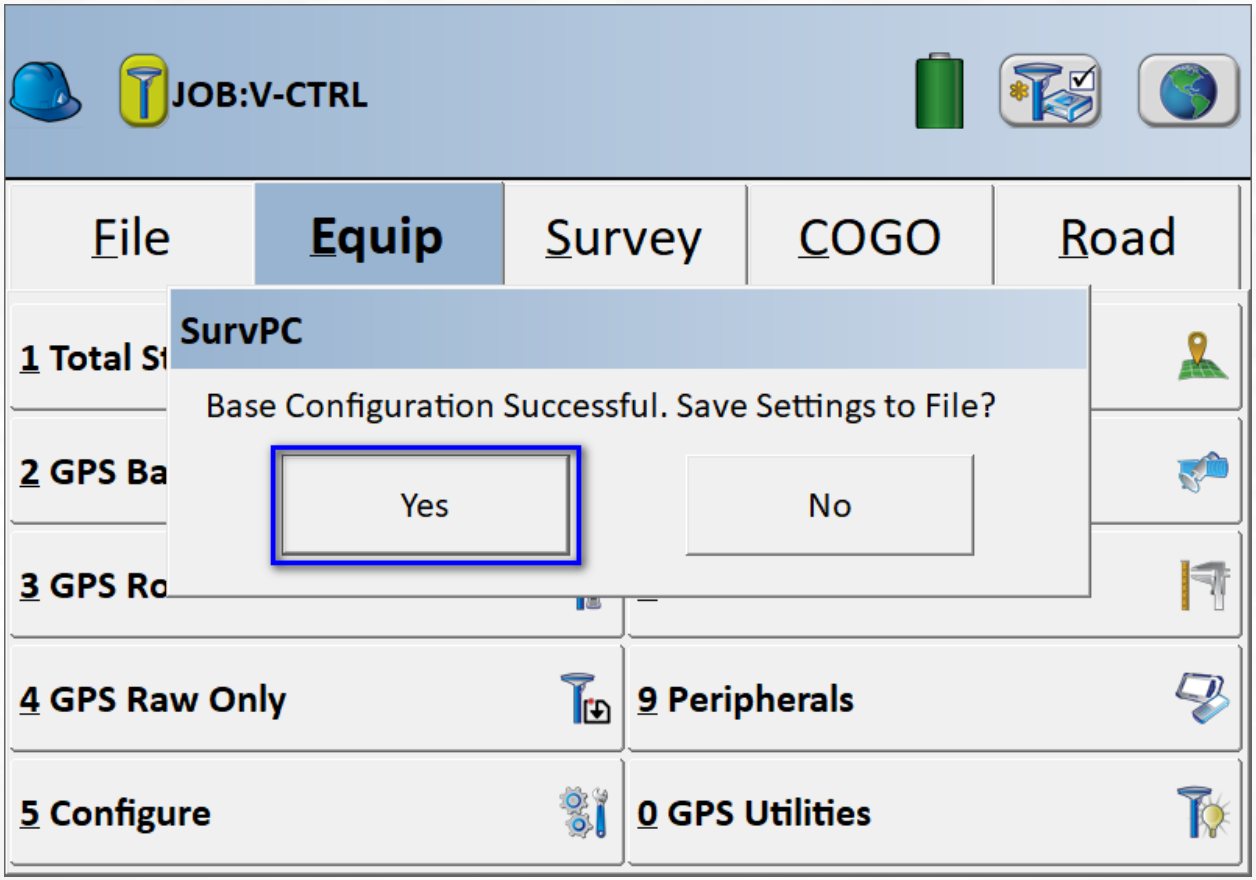
Roads – Step by Step



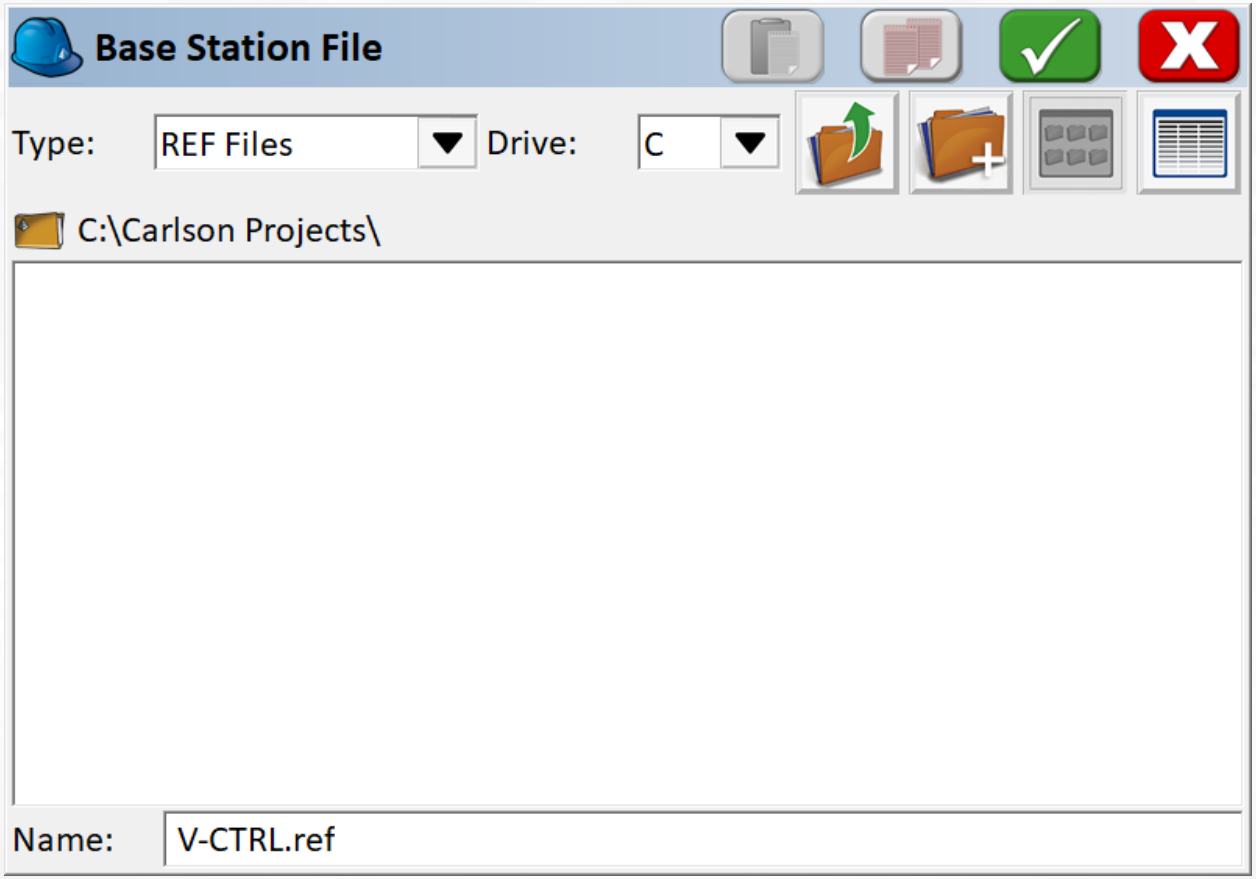
Roads – Step by Step



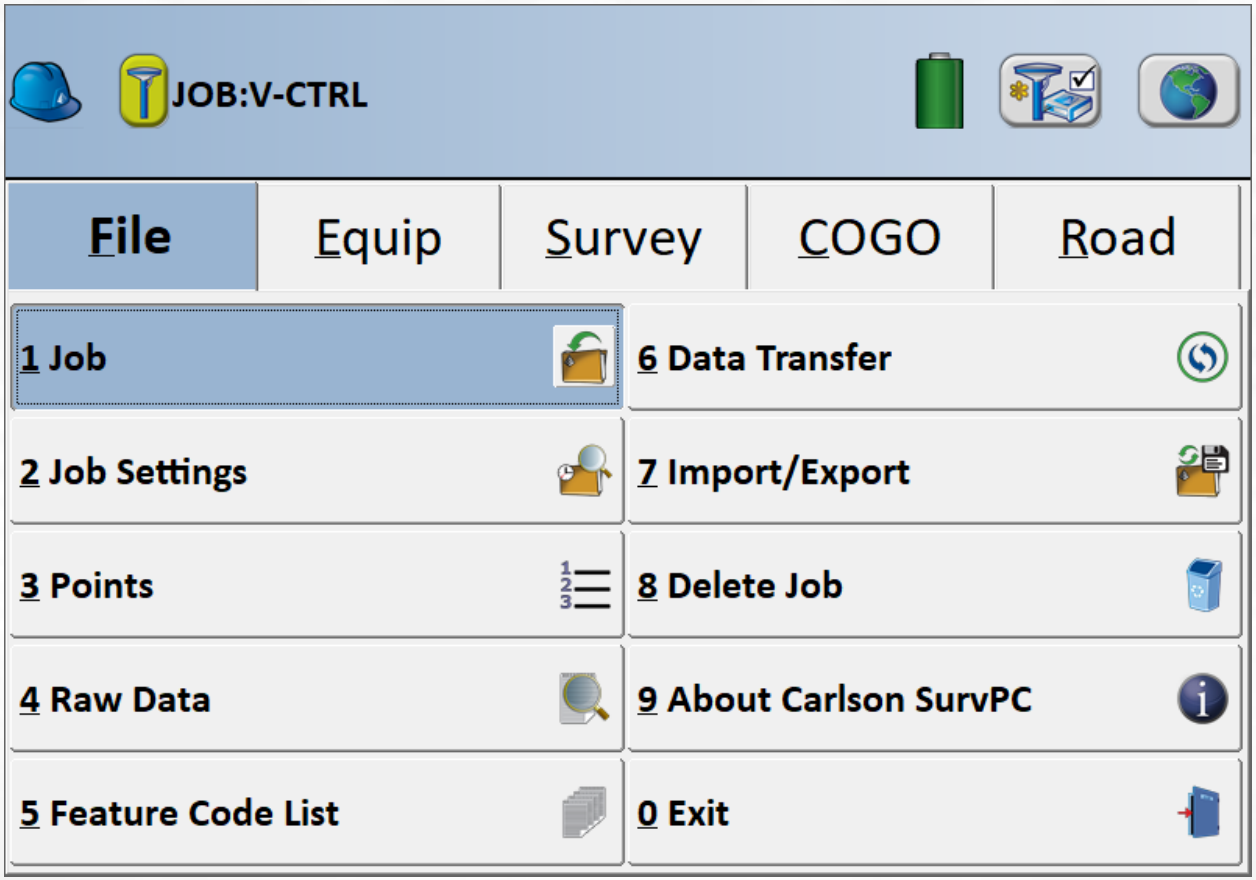
Roads – Step by Step



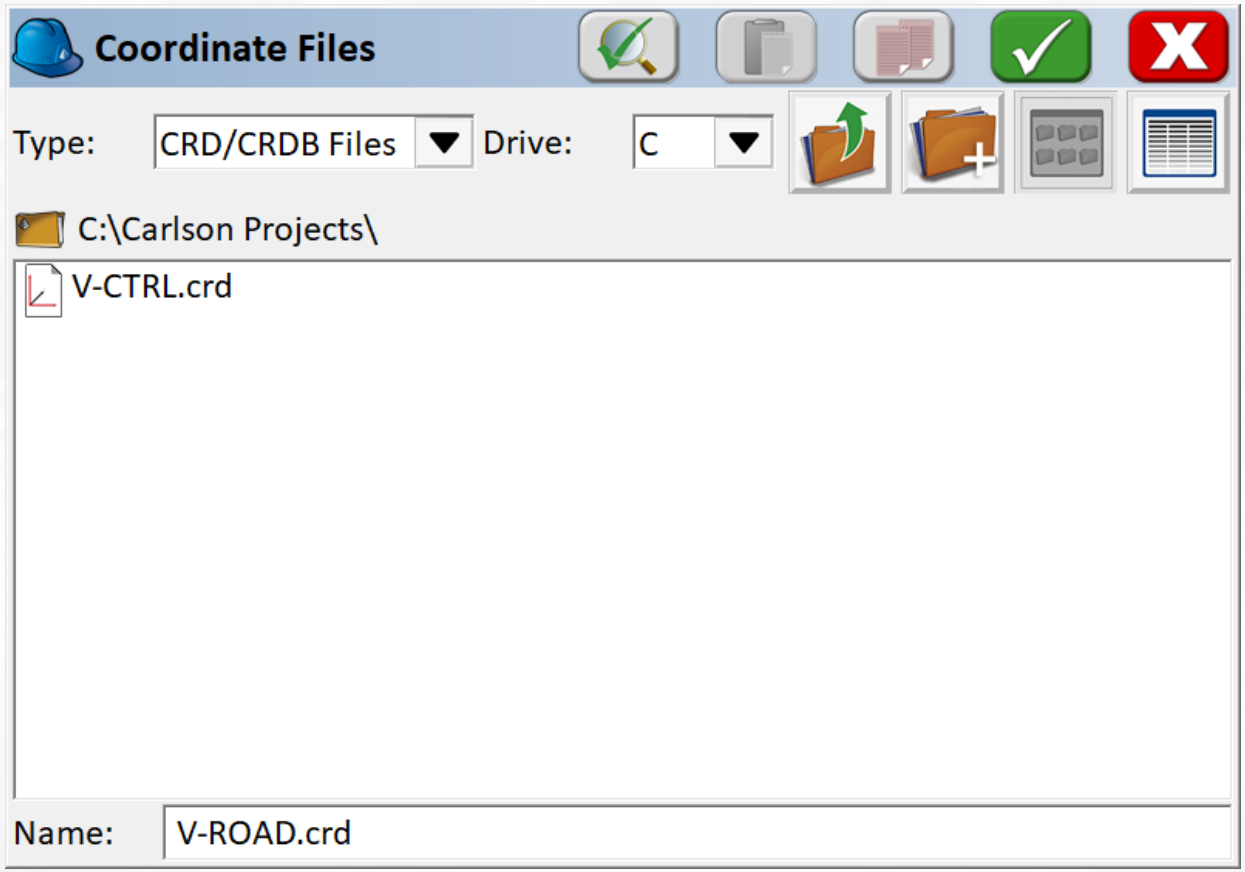
Roads – Step by Step



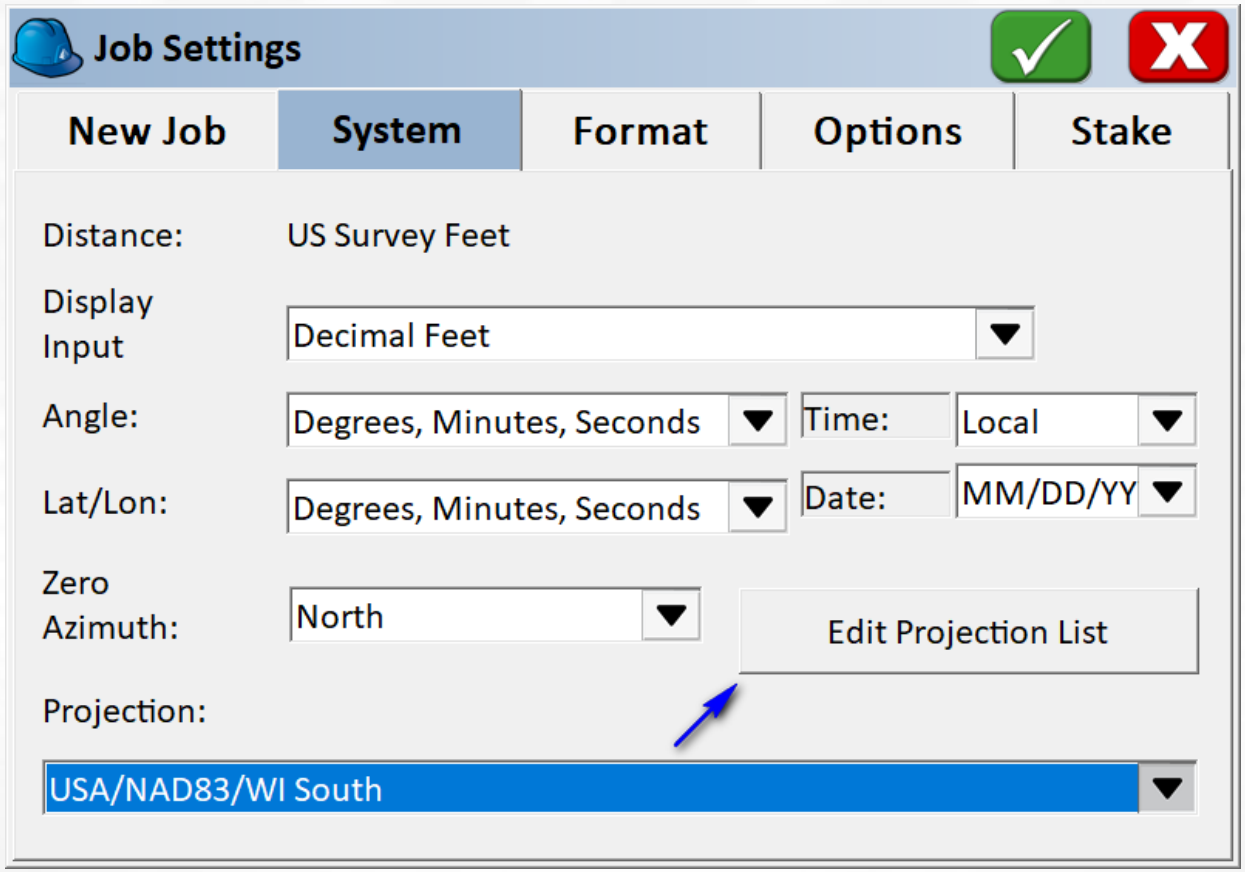
Roads – Step by Step



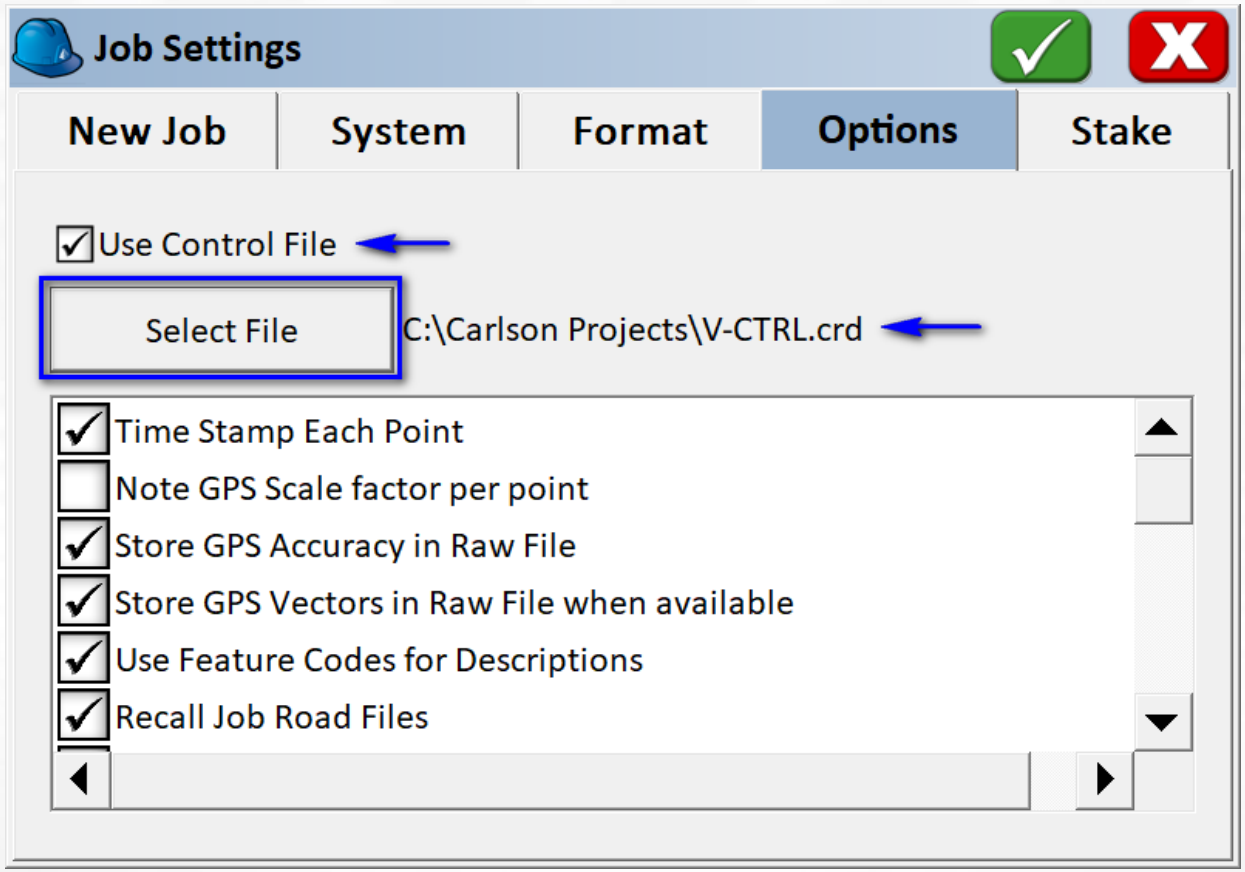
Roads – Step by Step



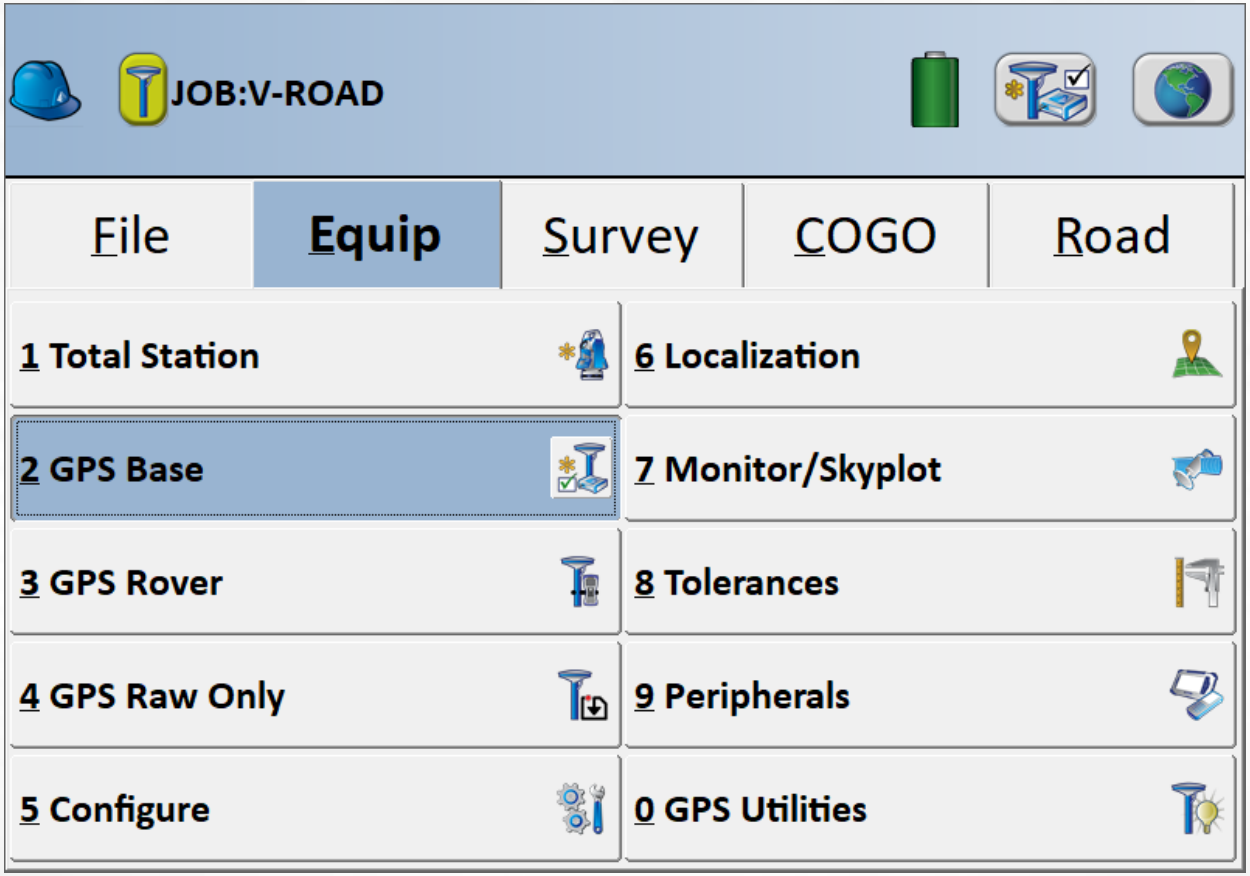
Roads – Step by Step



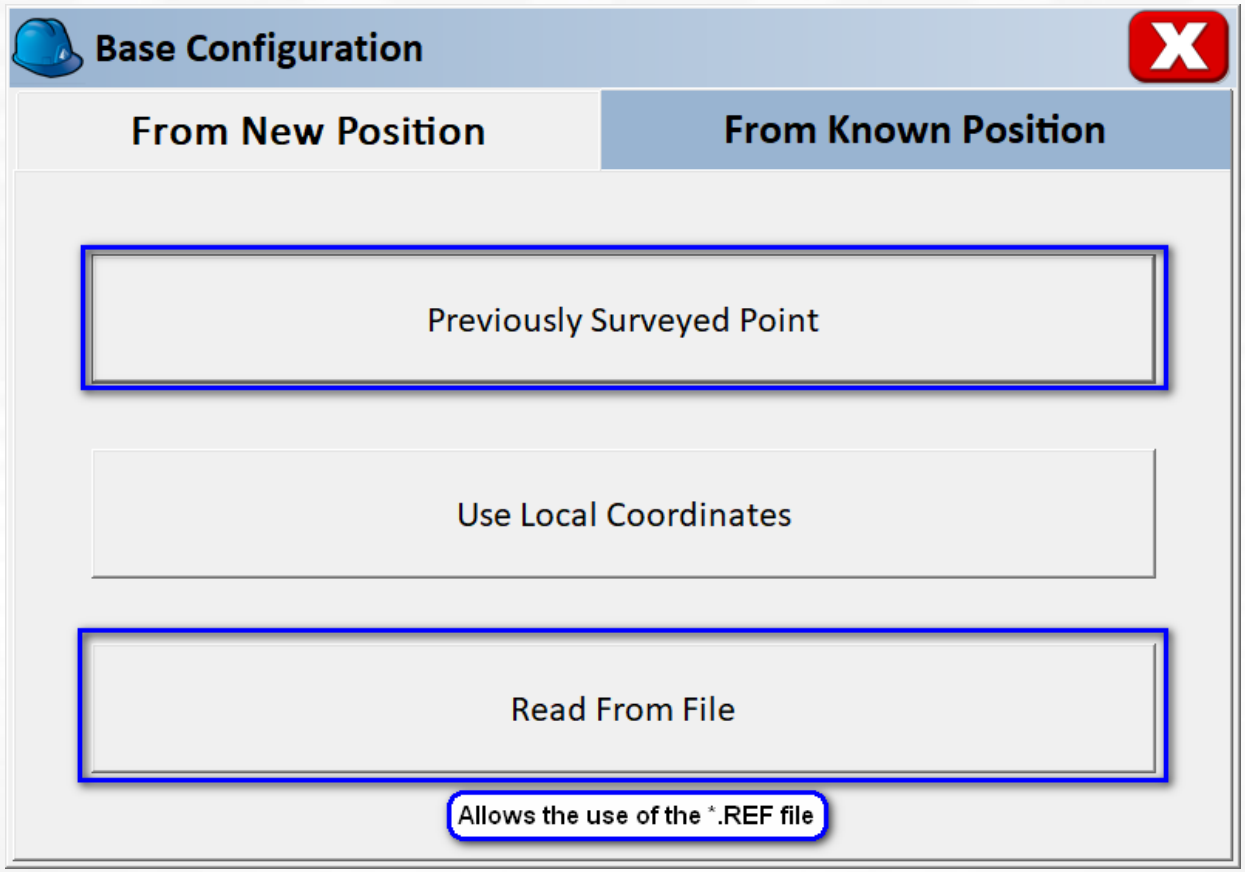
Roads – Step by Step



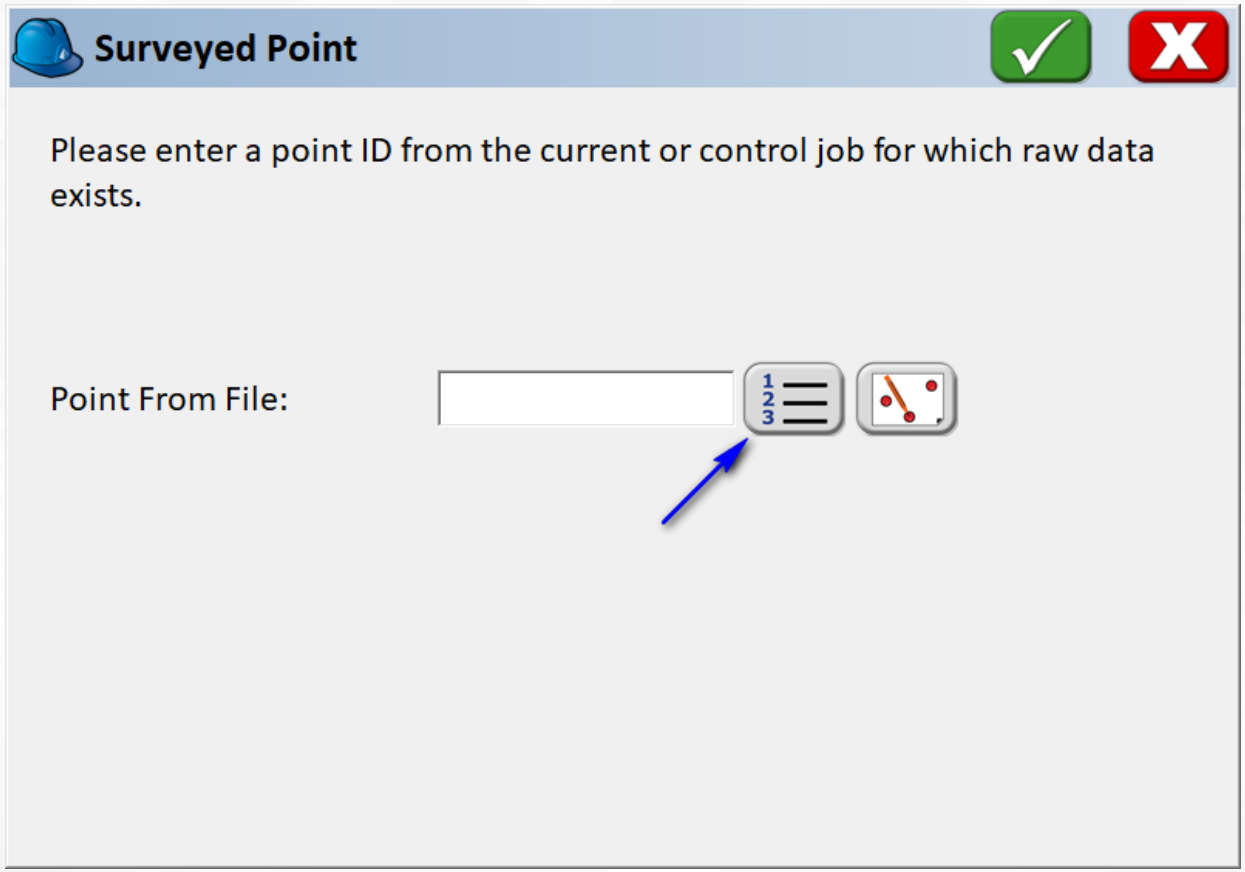
Roads – Step by Step



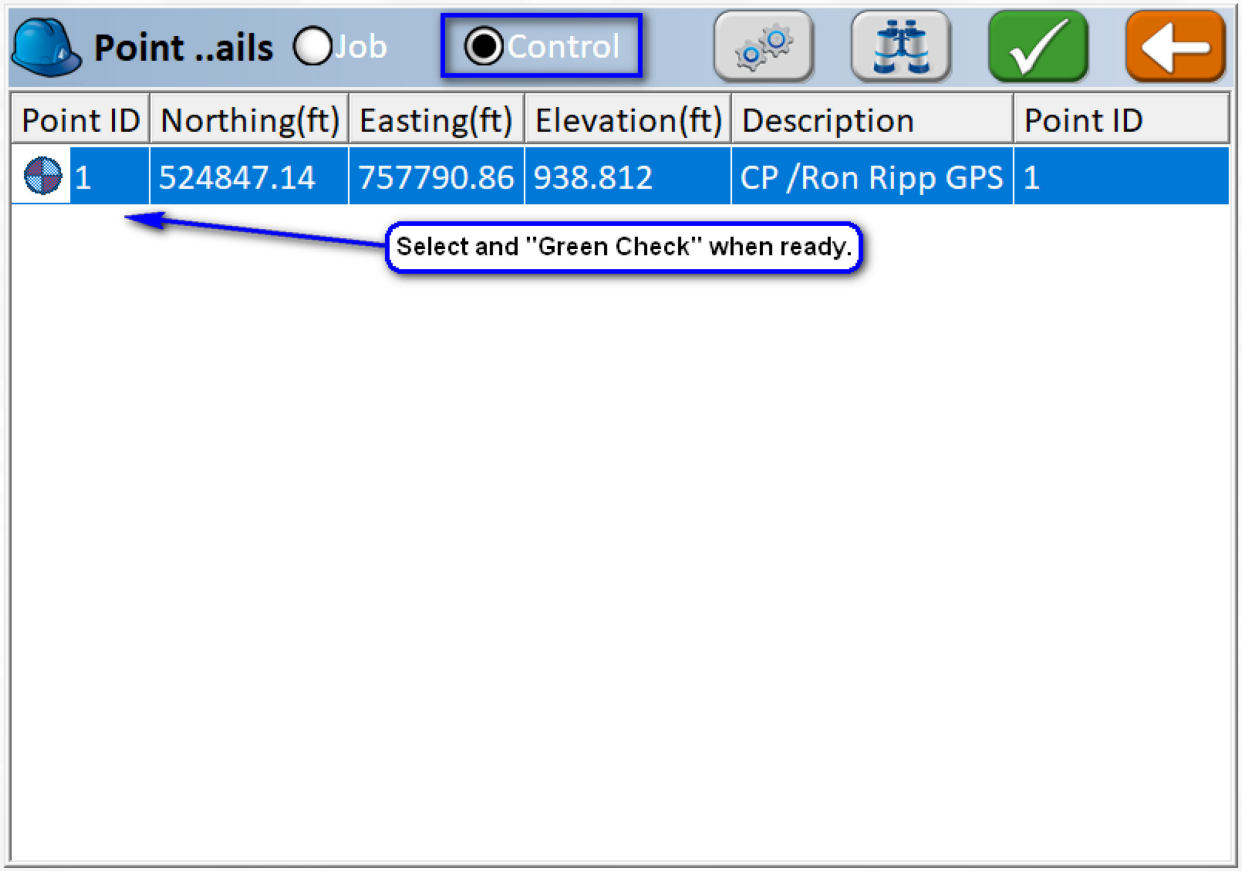
Roads – Step by Step



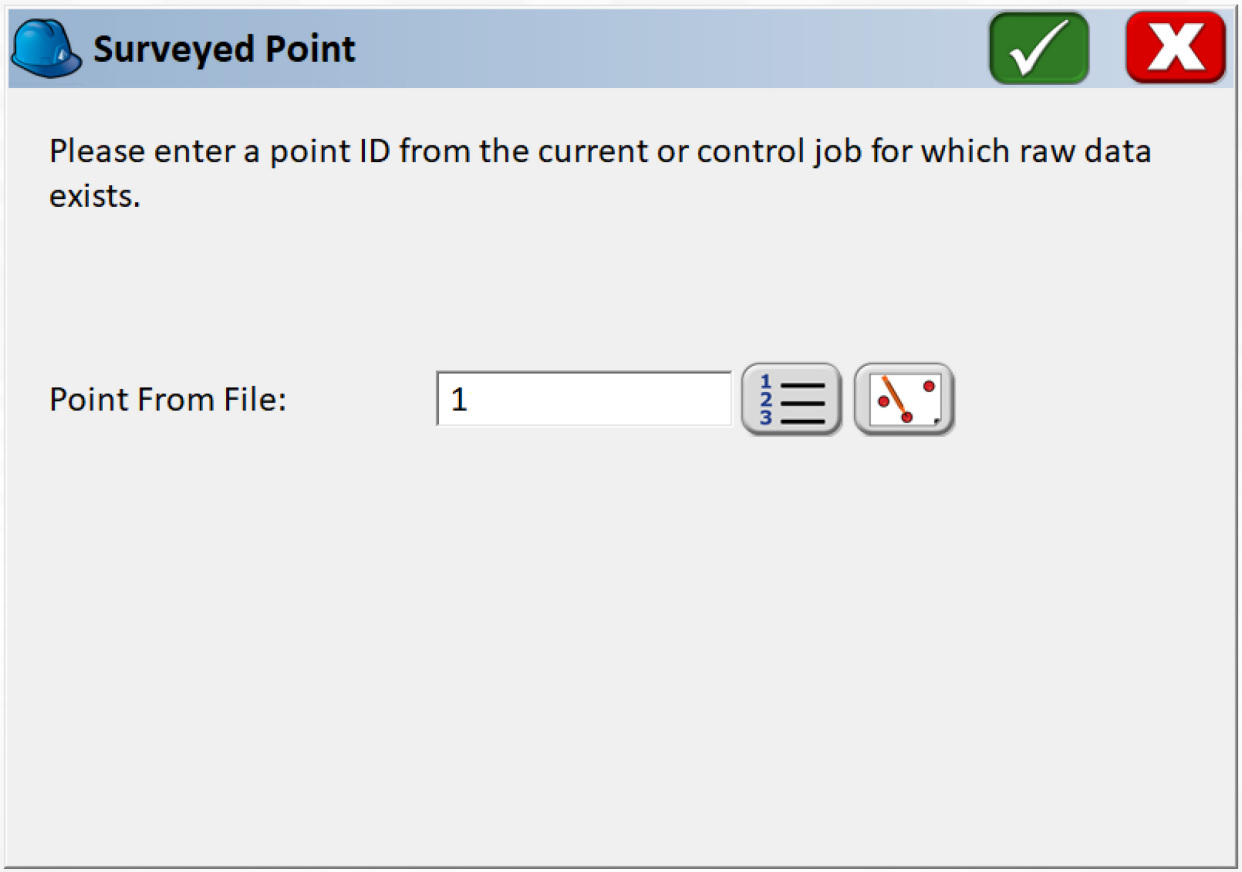
Roads – Step by Step



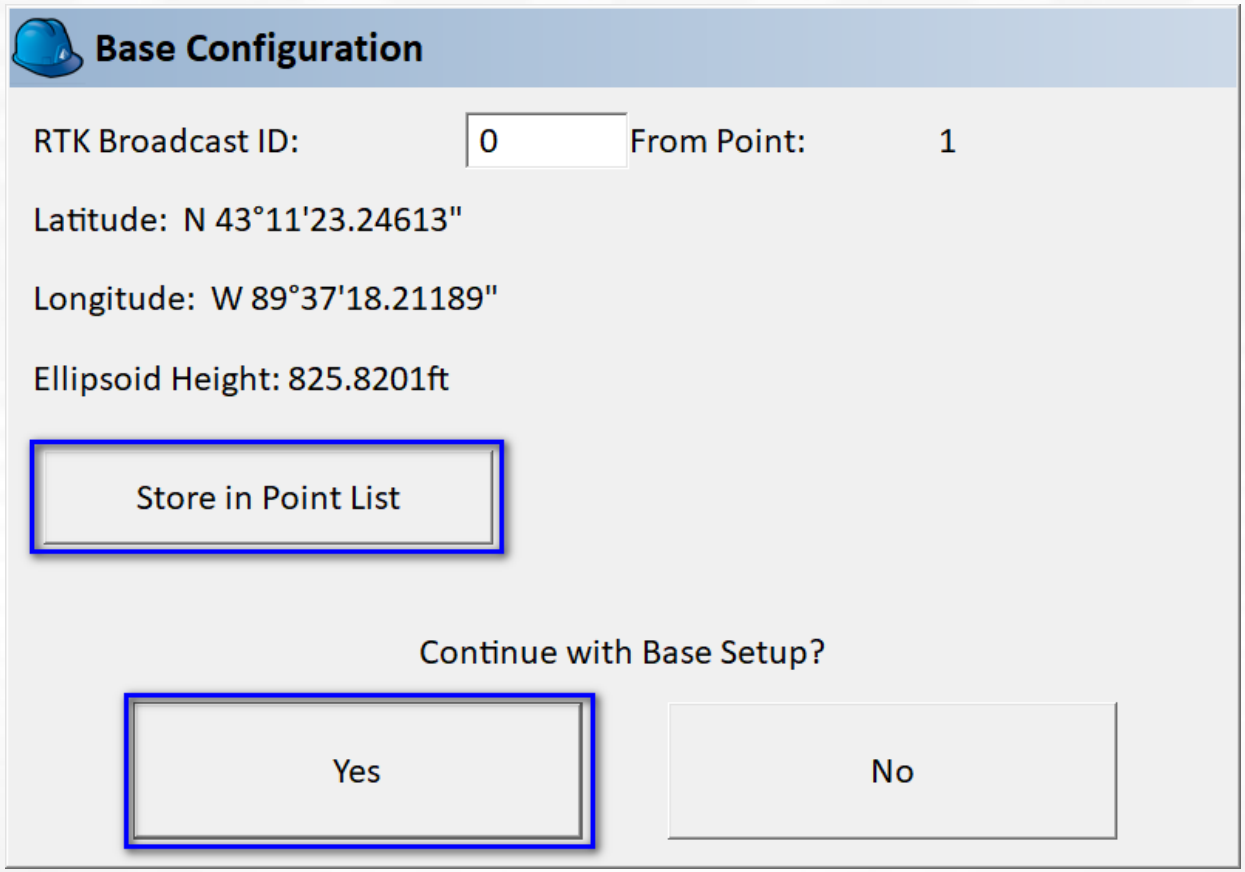
Roads – Step by Step



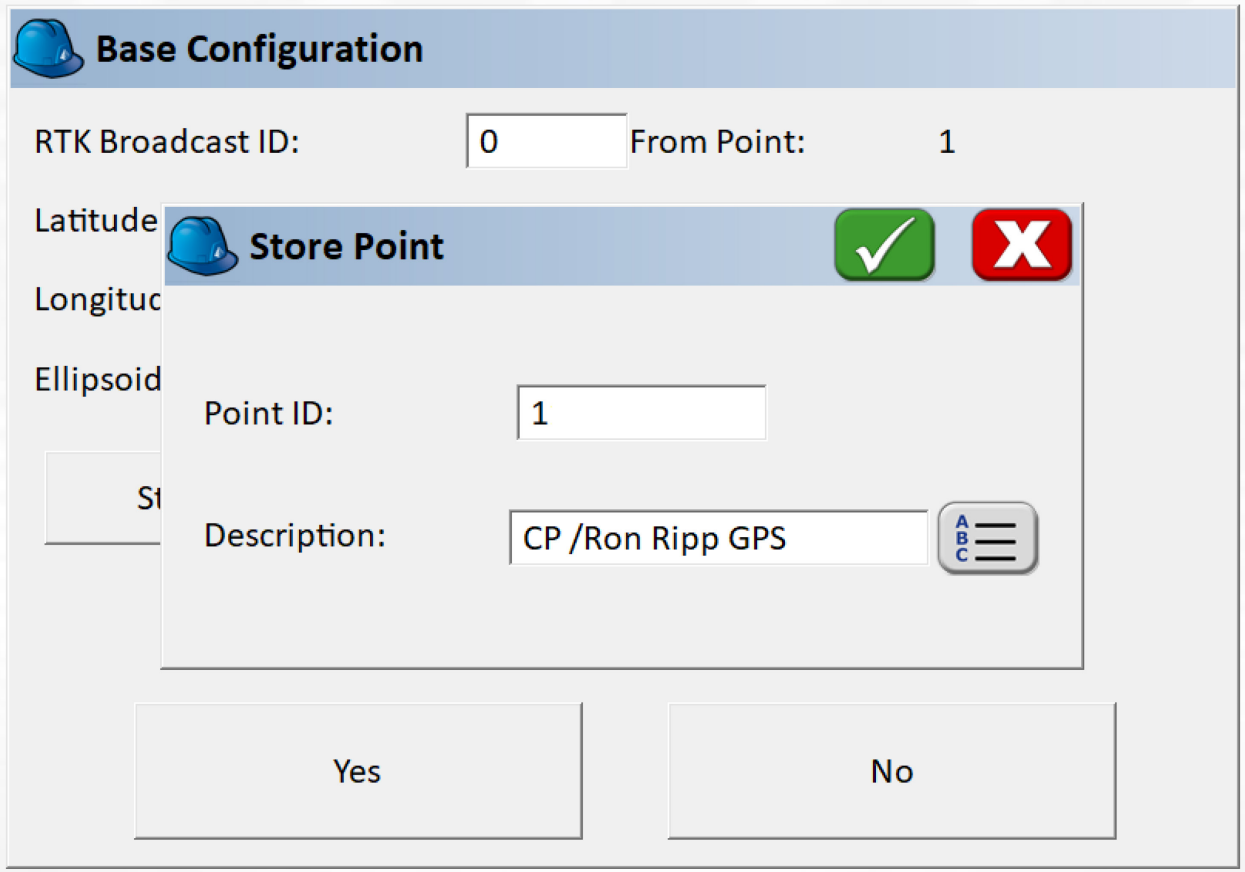
Roads – Step by Step



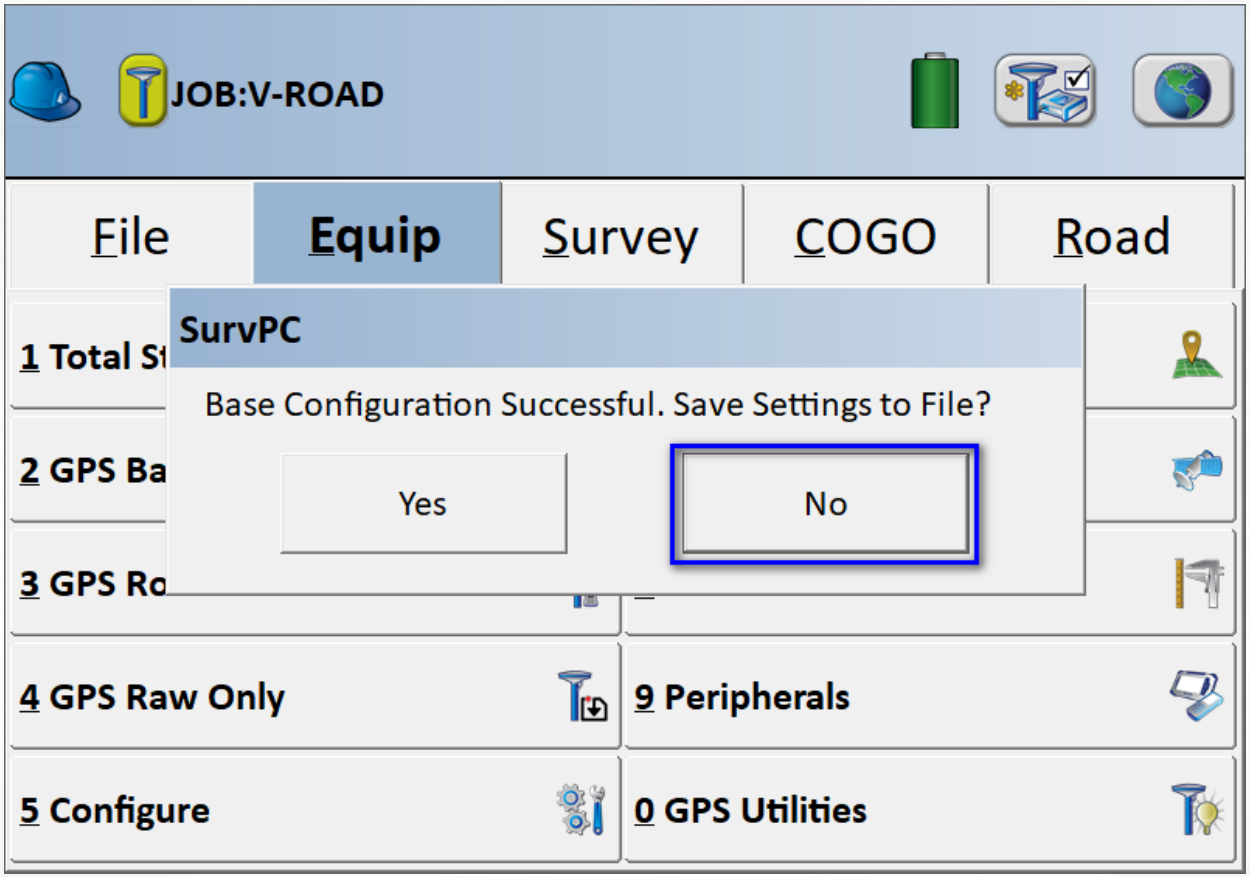
Roads – Step by Step



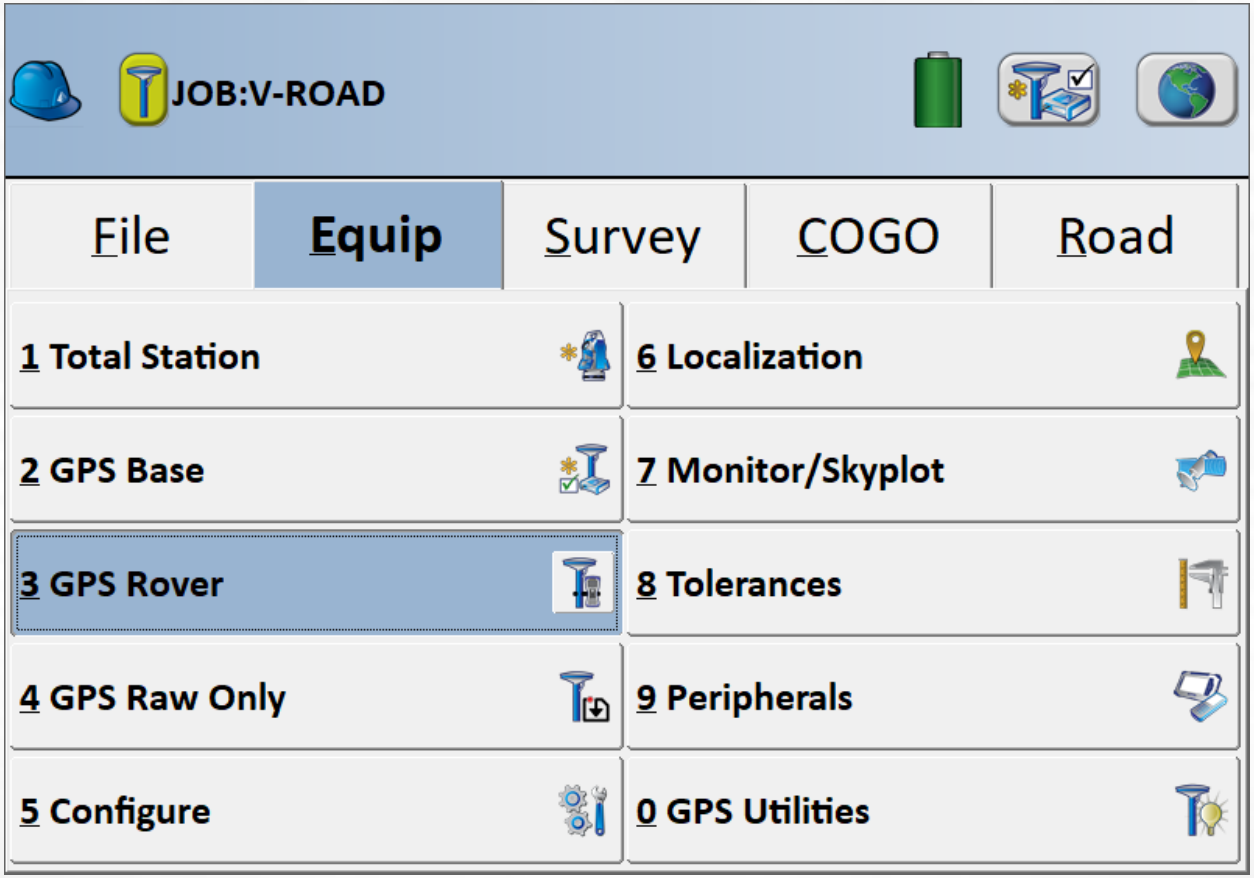
Roads – Step by Step



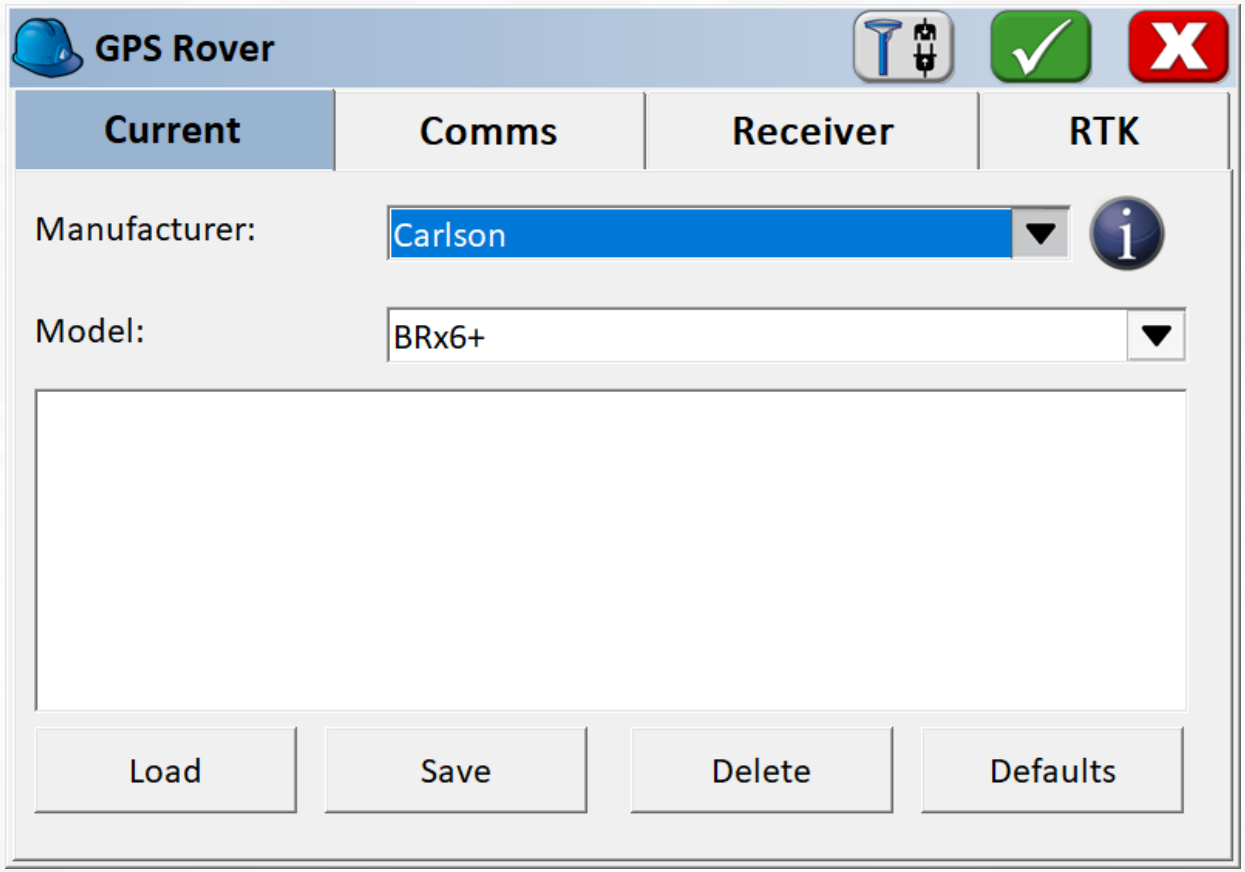
Roads – Step by Step



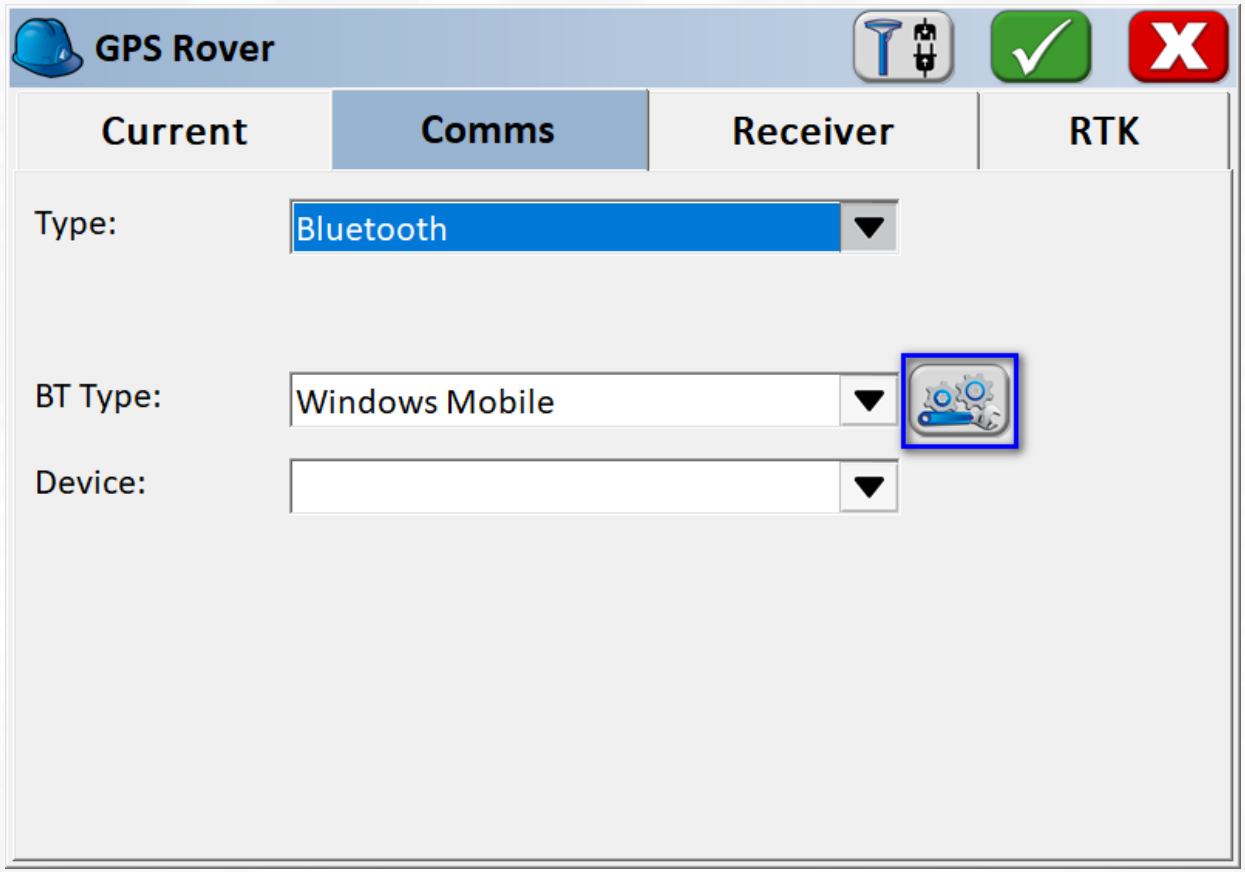
Roads – Step by Step



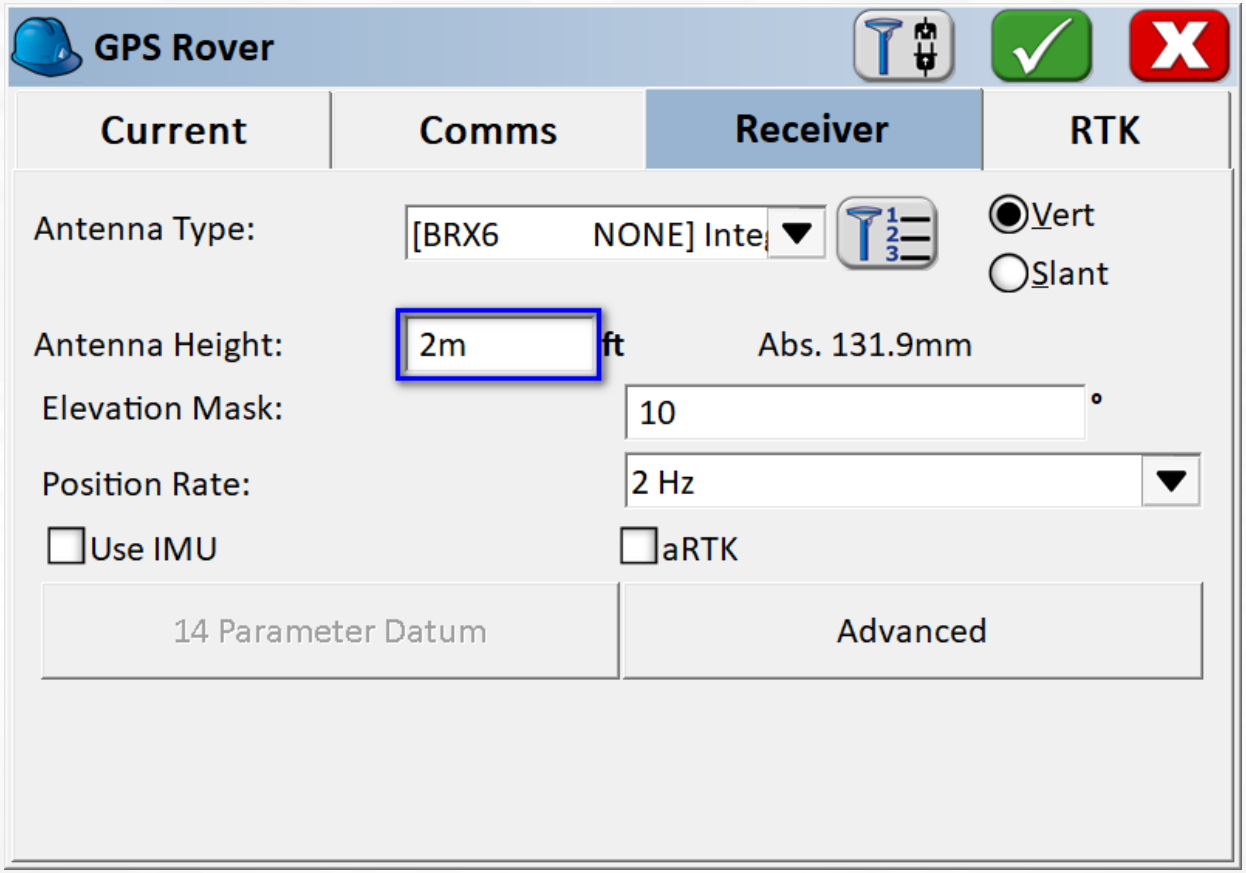
Roads – Step by Step



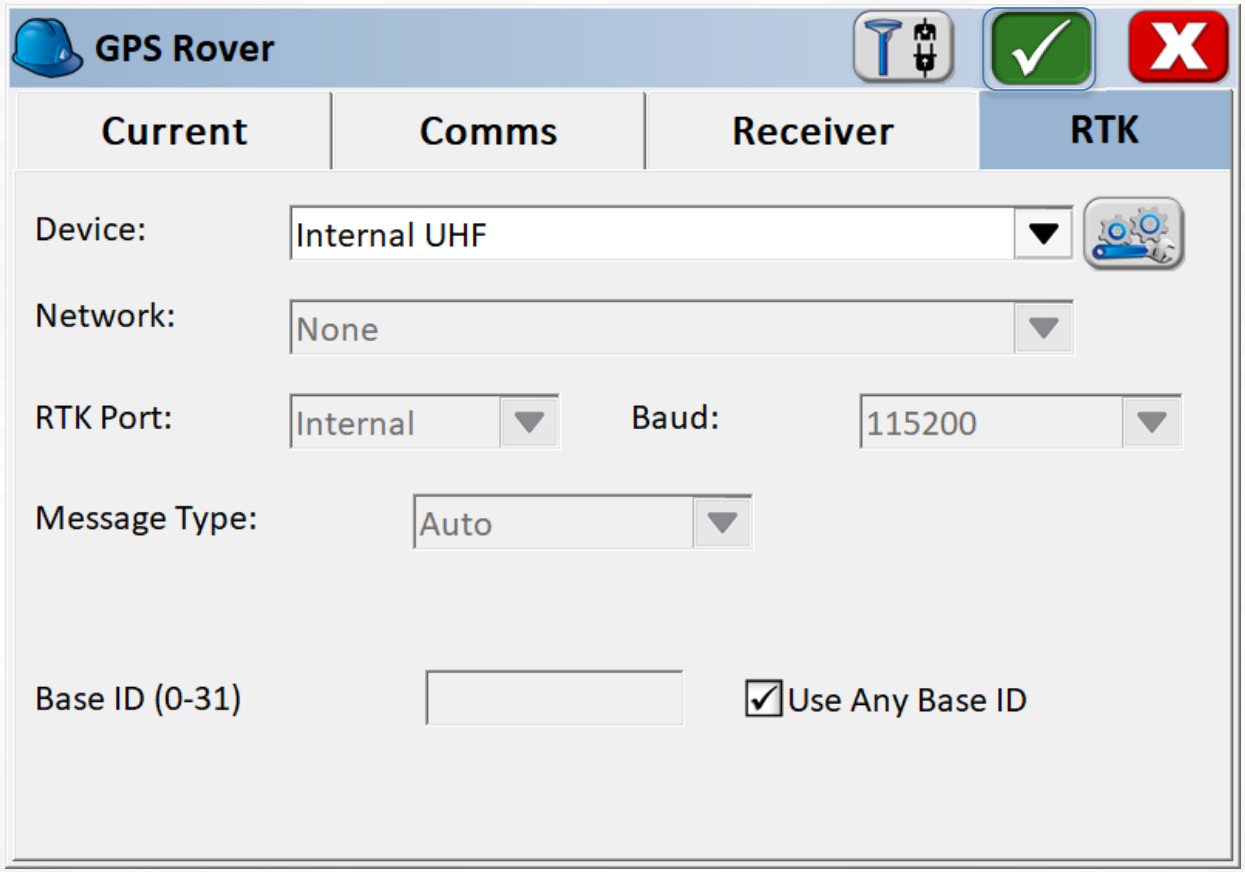
Roads – Step by Step



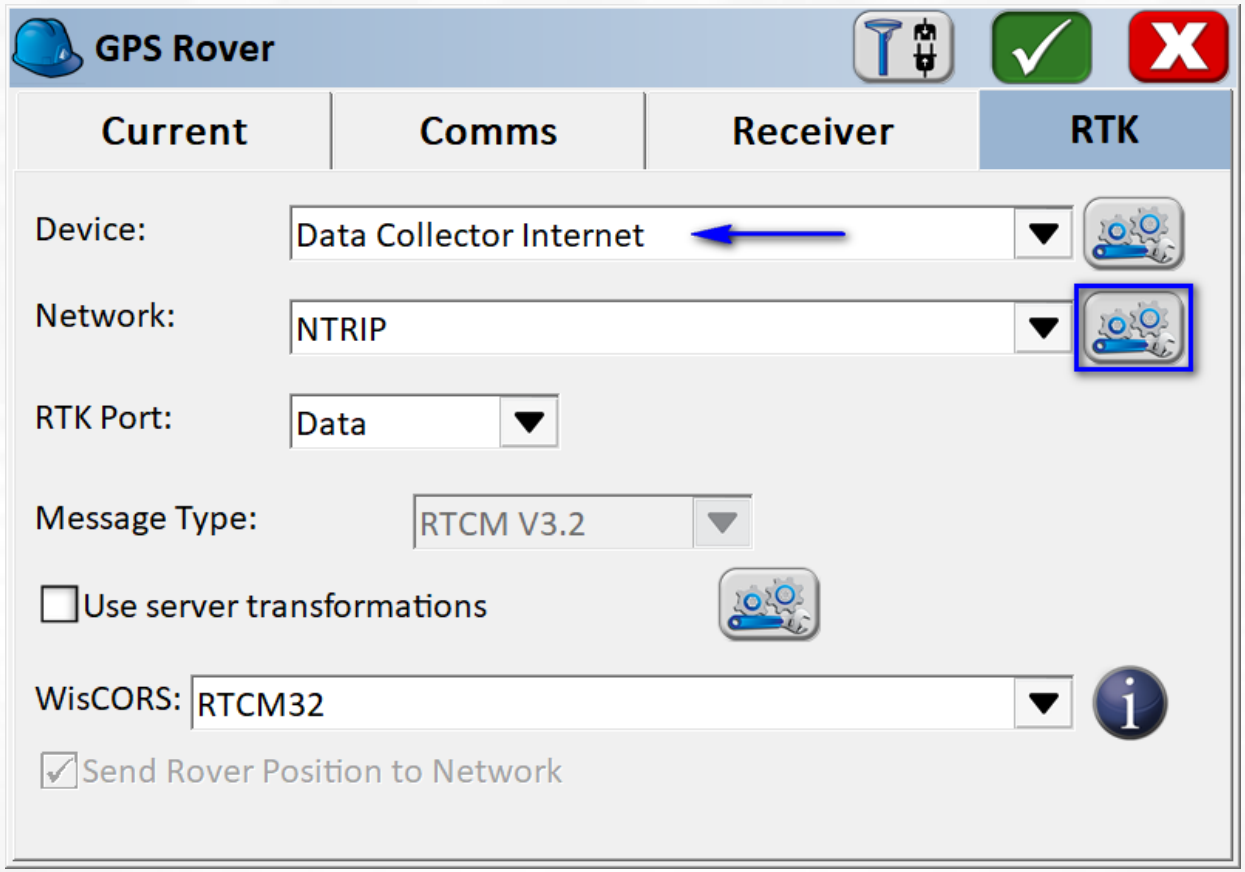
Roads – Step by Step



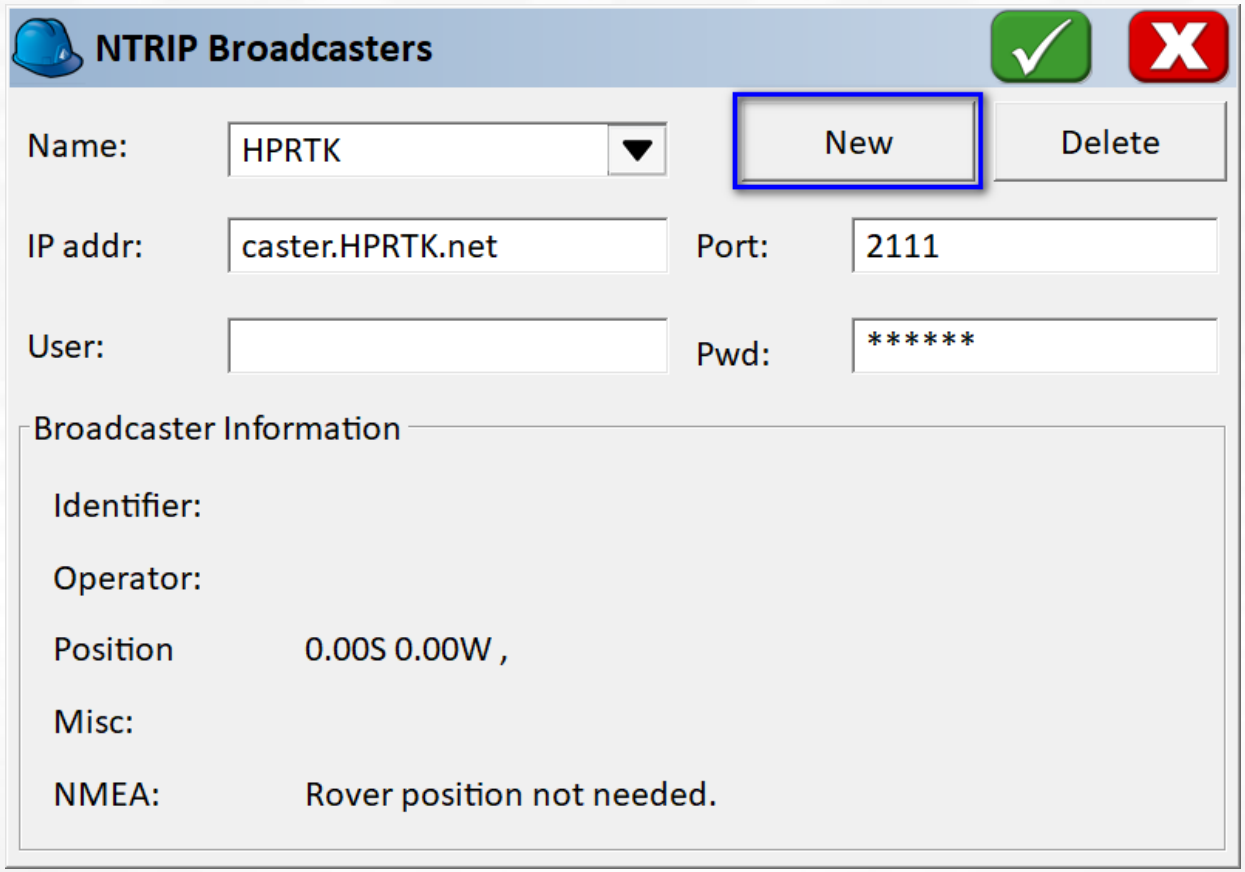
Roads – Step by Step



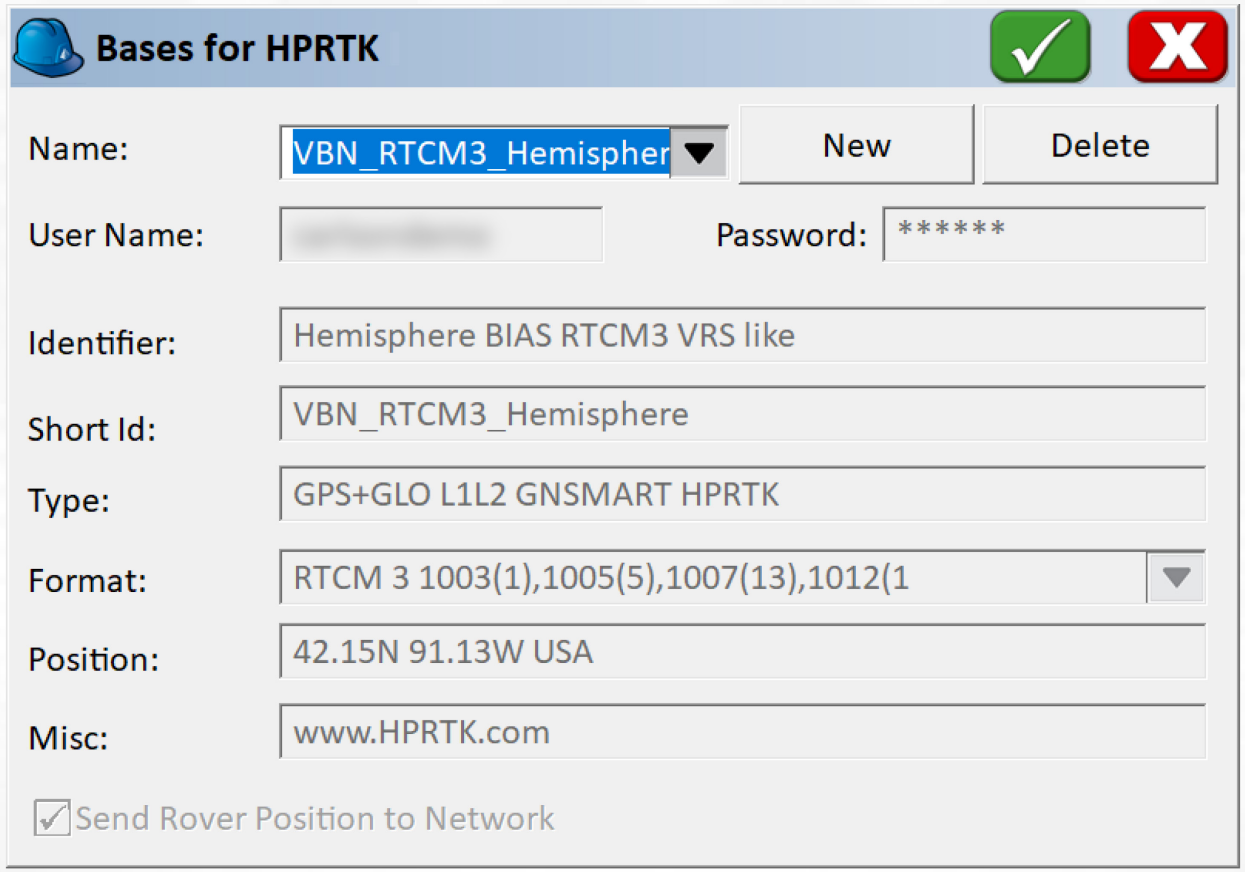
Roads – Step by Step



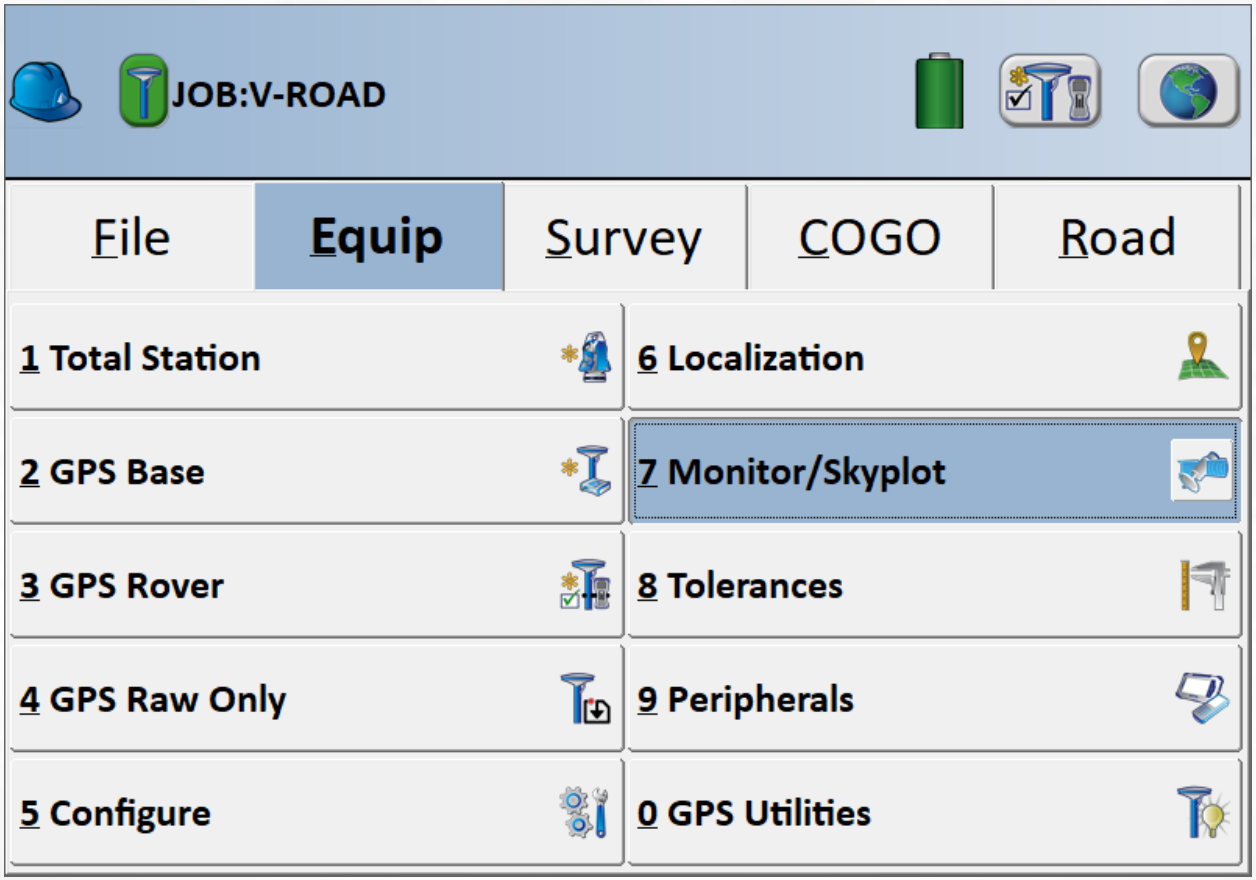
Roads – Step by Step



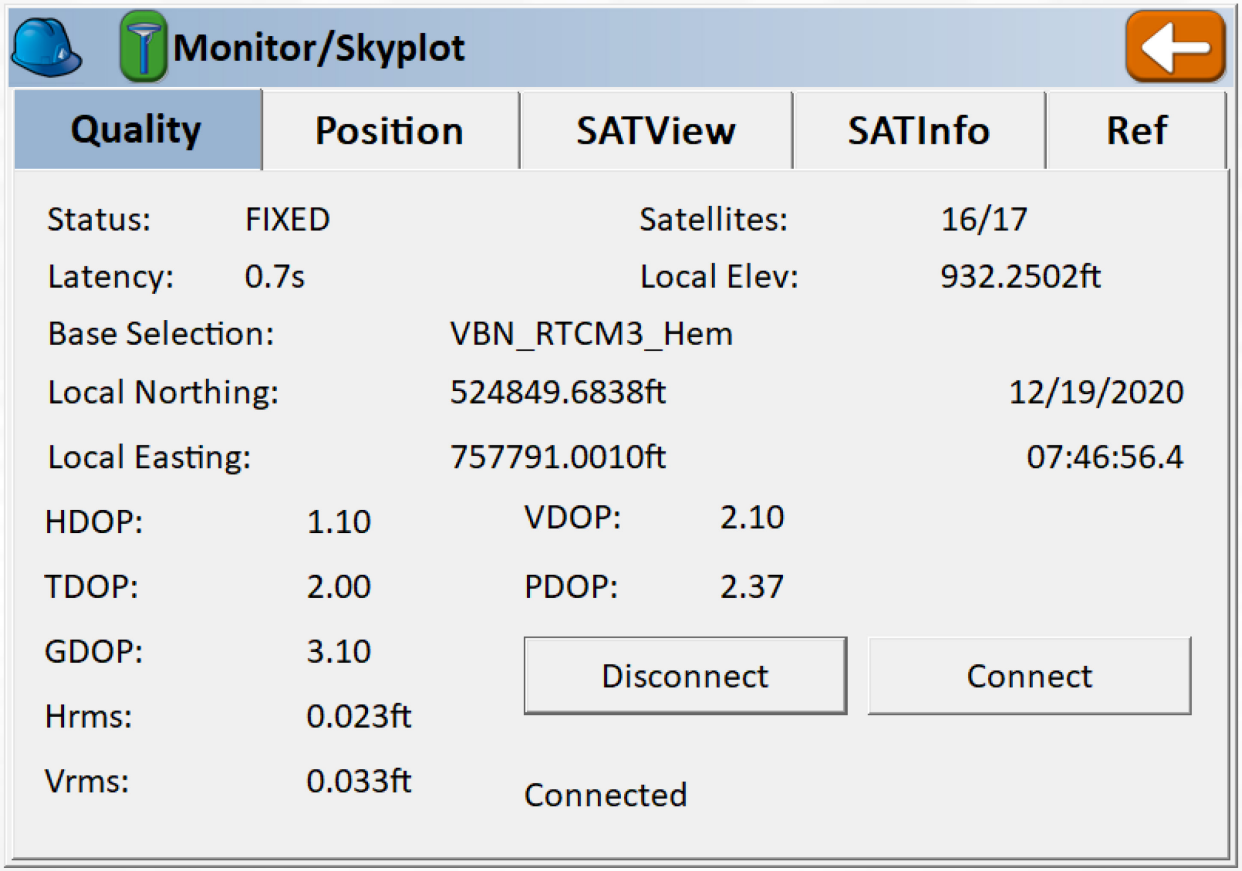
Roads – Step by Step



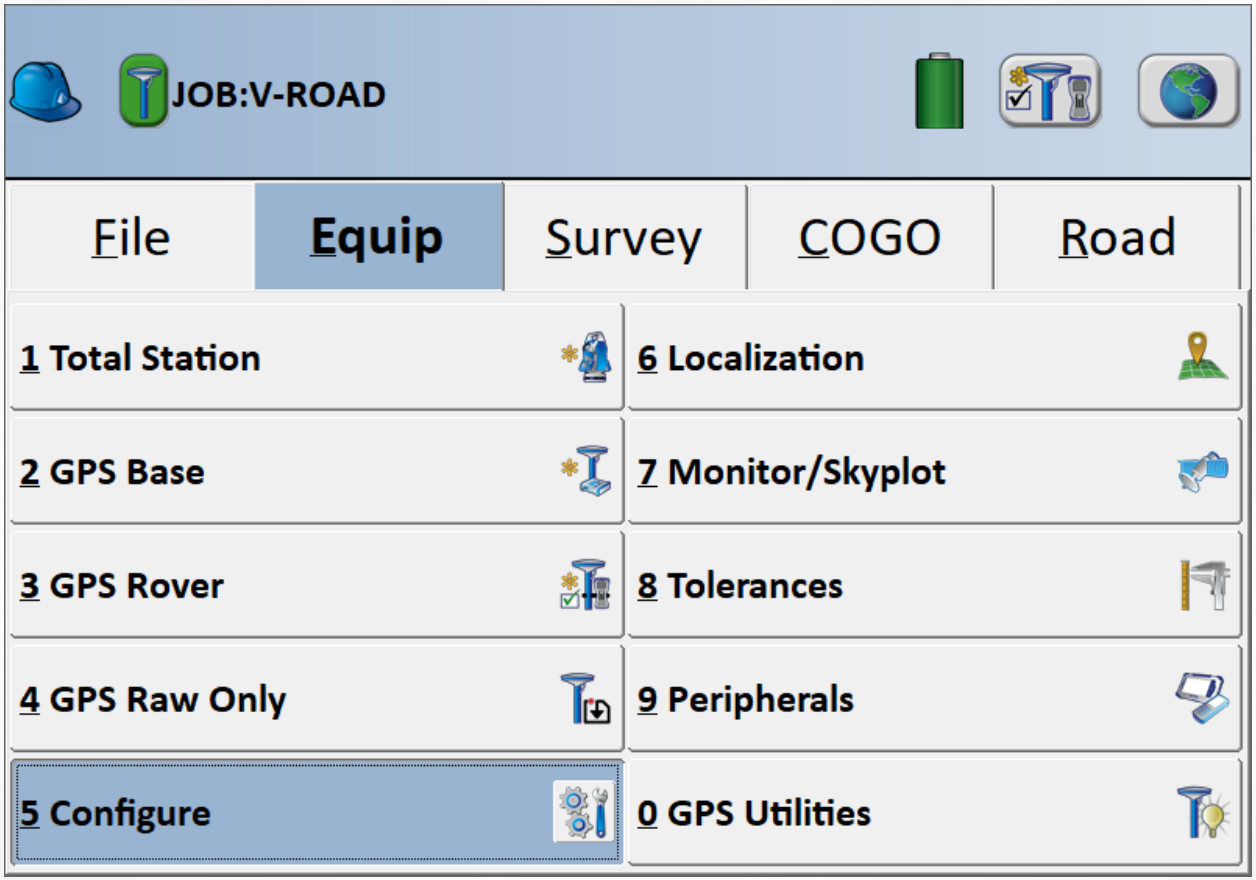
Roads – Step by Step



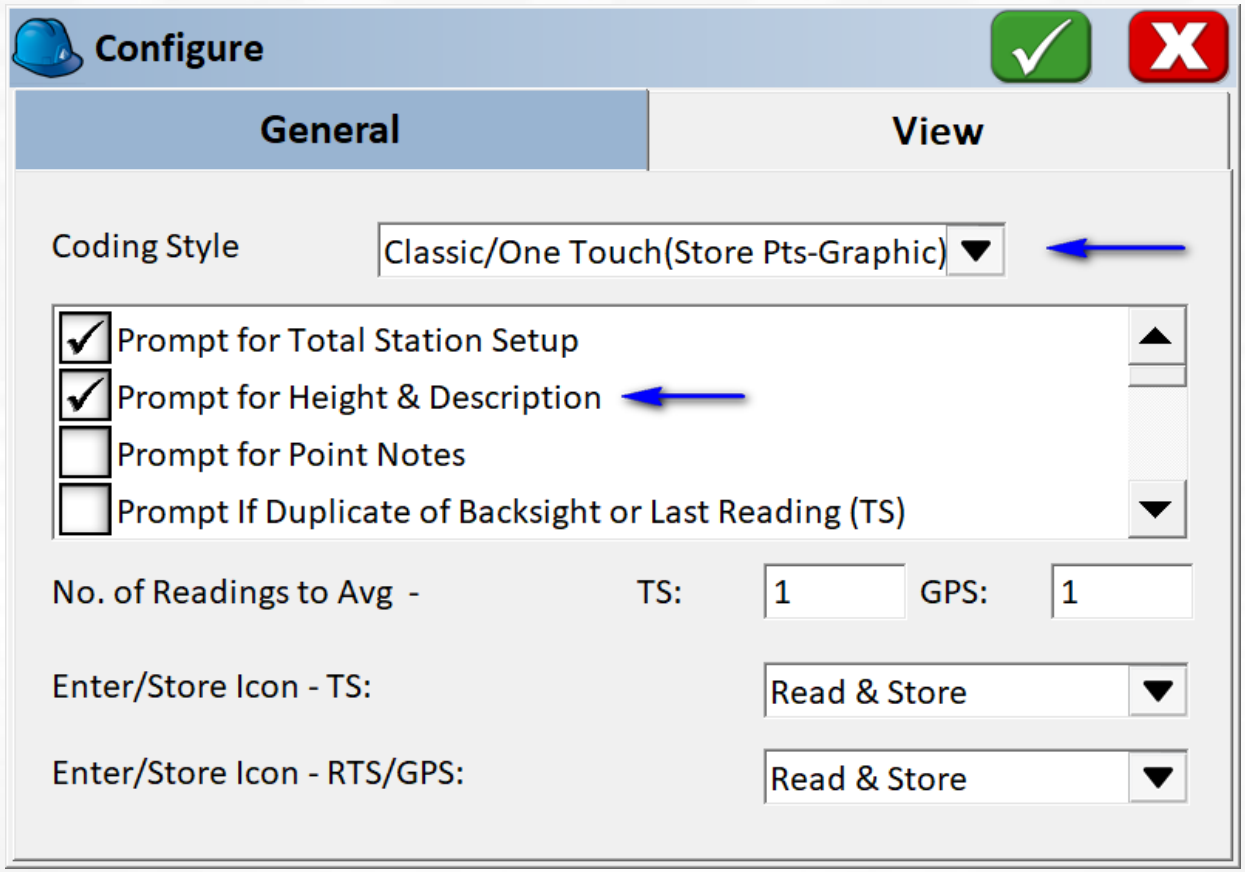
Roads – Step by Step



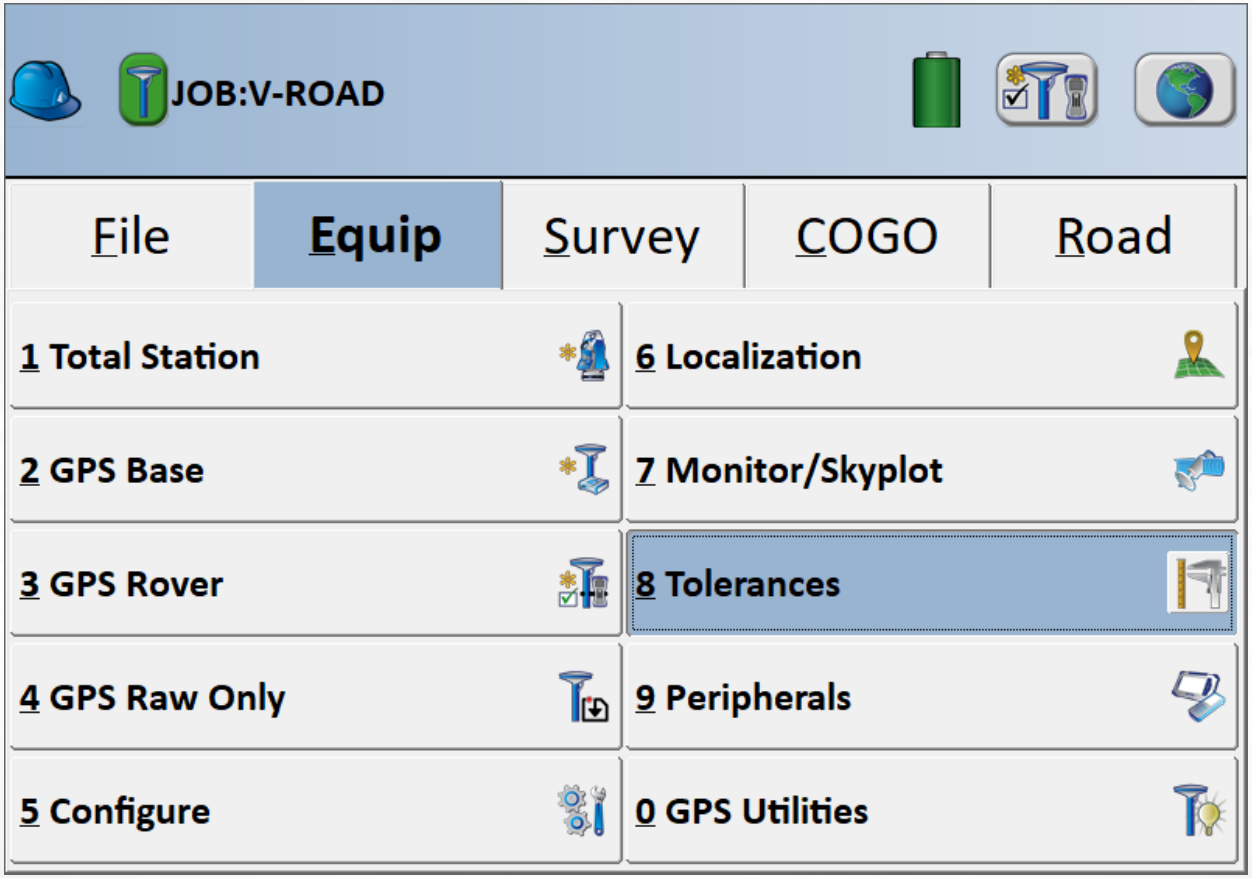
Roads – Step by Step



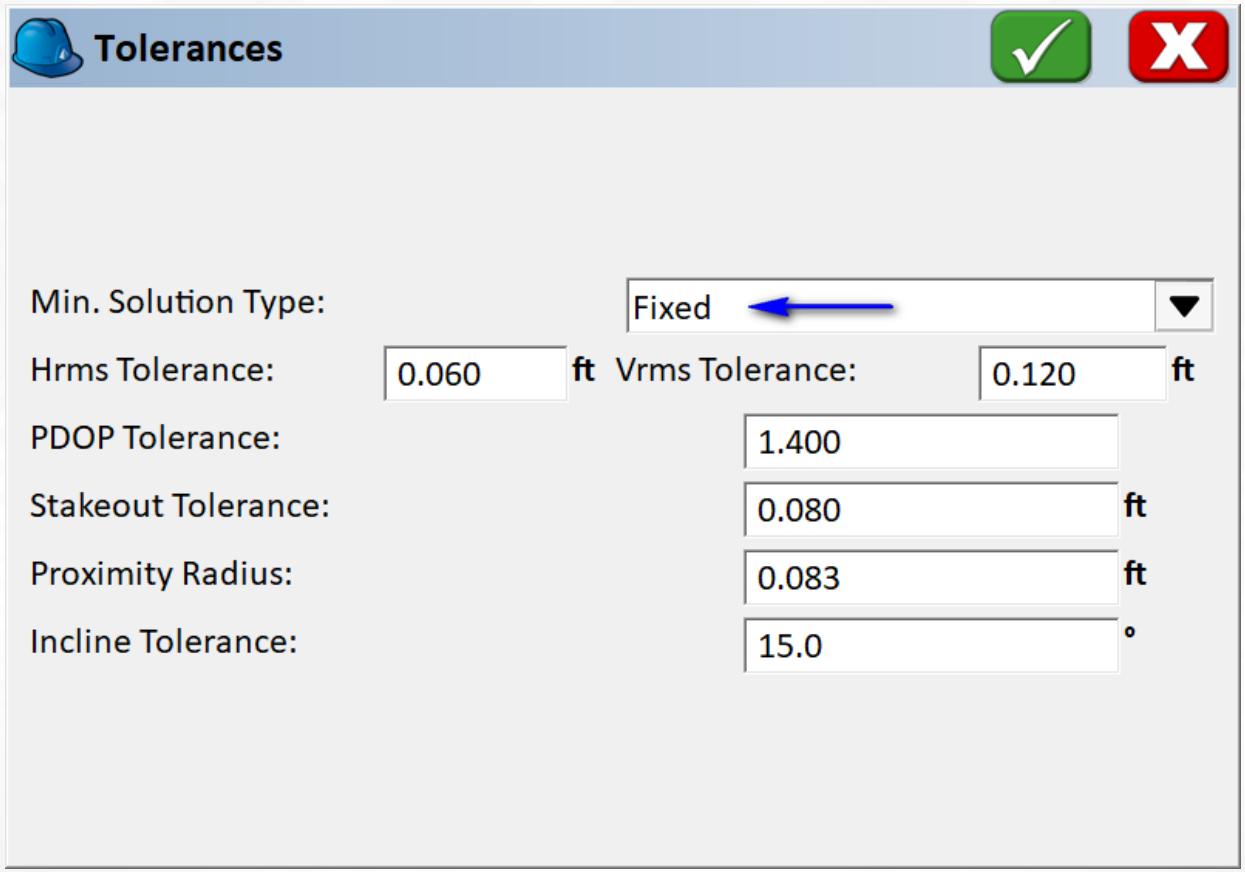
Roads – Step by Step



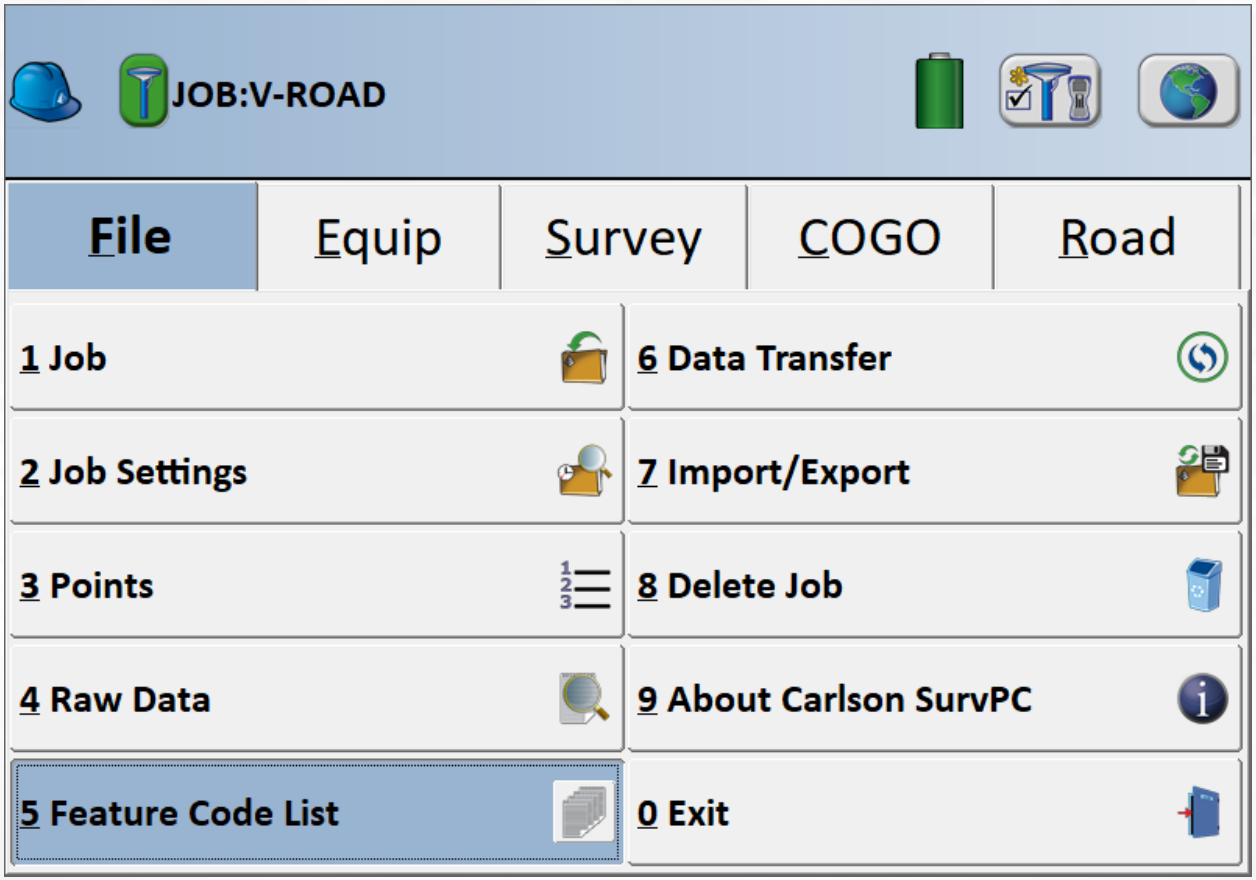
Roads – Step by Step



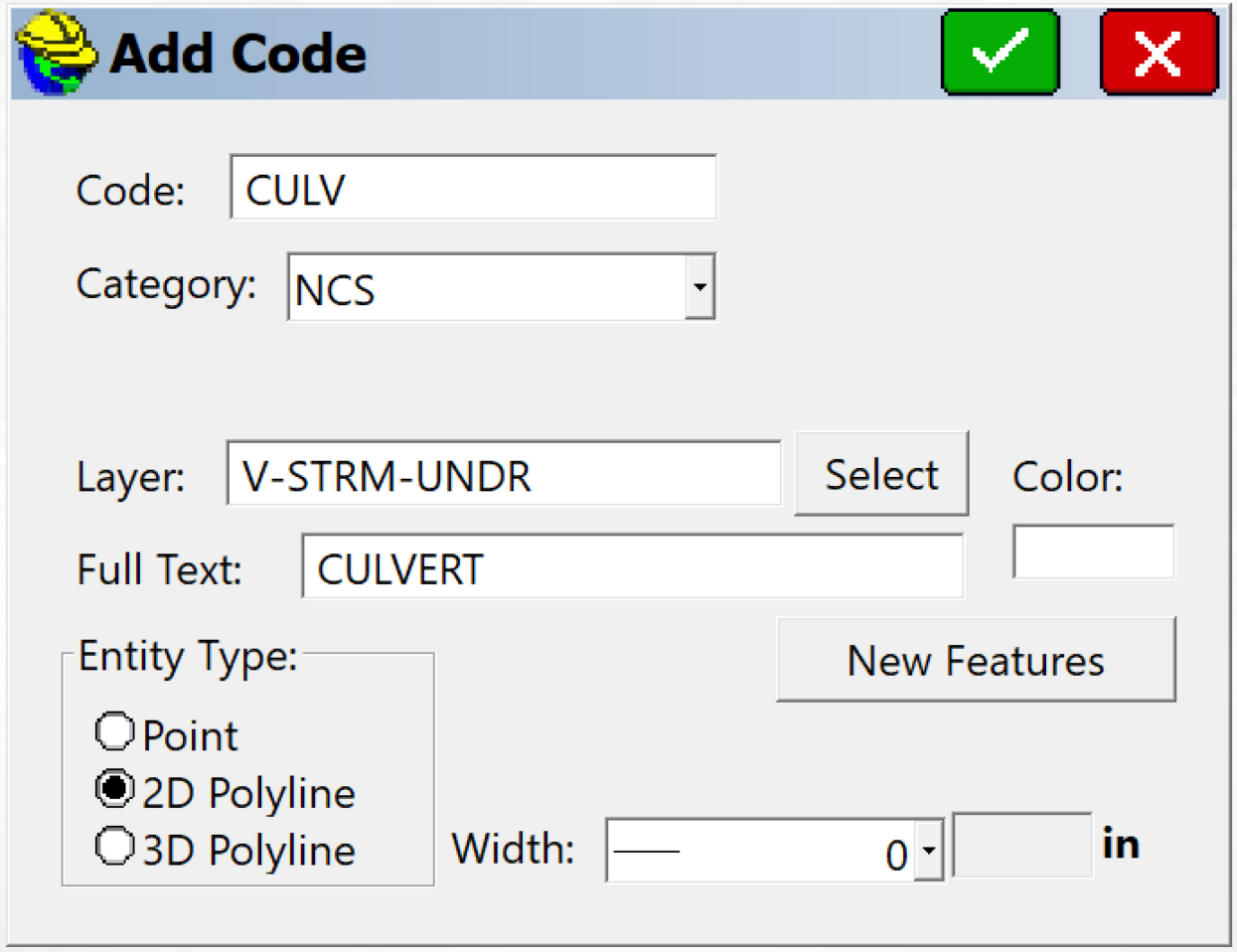
Roads – Step by Step



Roads – Step by Step



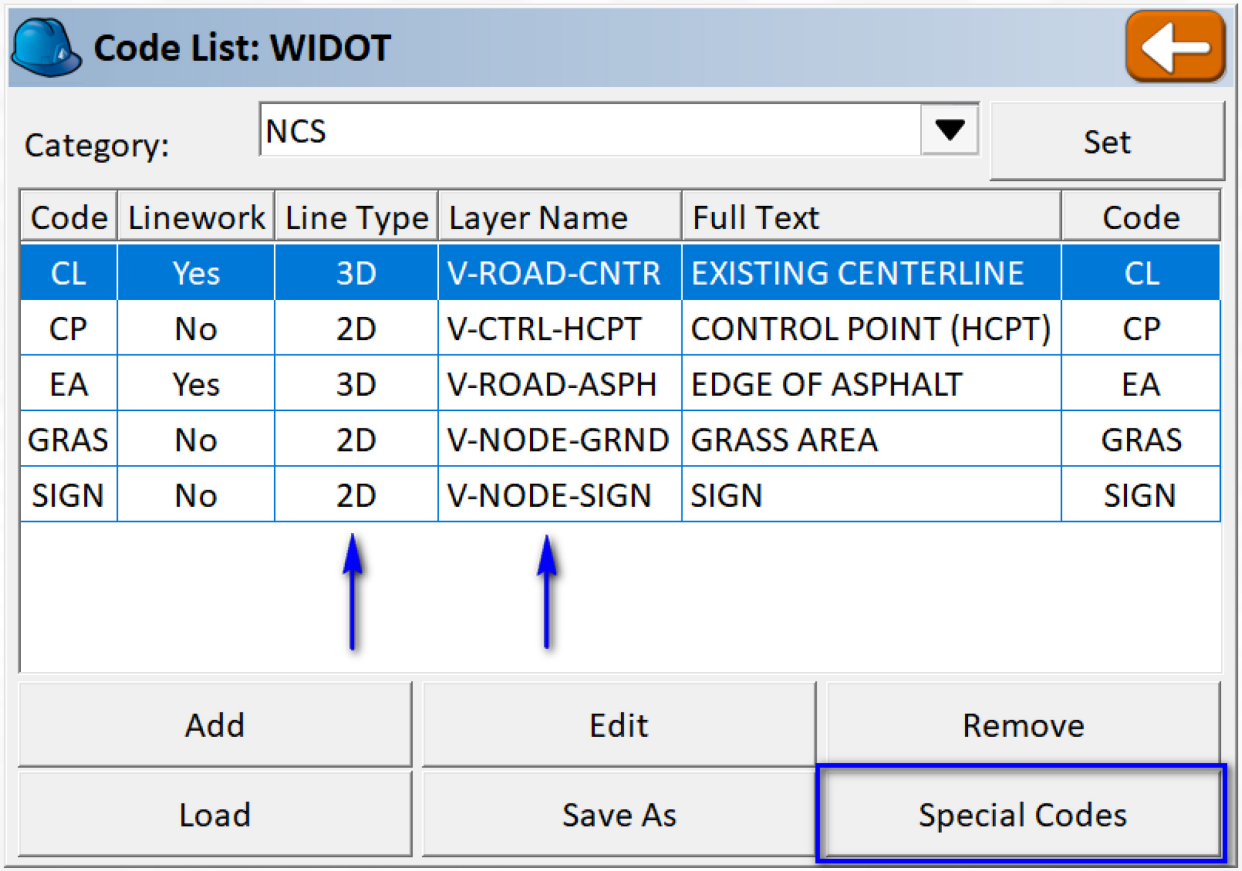
Roads – Step by Step



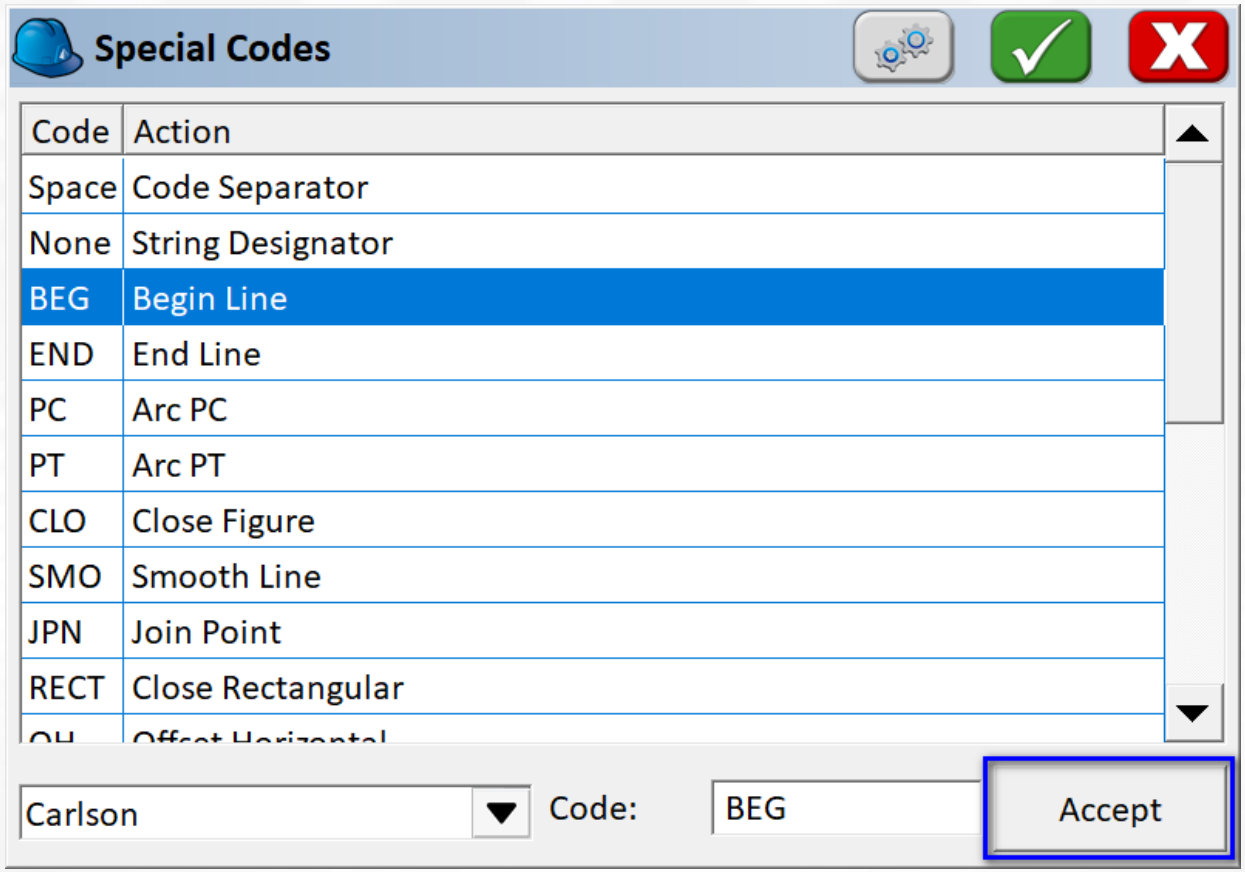
Roads – Step by Step

Code	Layer	Entity
BERM	V-BRKL	3D Pline
BLDG	V-BLDG-OTLN	2D Pline
BSL	V-BRKL-BOTB	3D & 2D
CL	V-ROAD-CNTR	3D & 2D
CP	V-CTRL-HCPT	Point
CULV	V-STRM-UNDR	2D Pline
DTCH	V-DTCH-CNTR	3D & 2D
DTRE	V-NODE-TREE	Point
EA	V-ROAD-ASPH	3D & 2D
FL	V-BRKL-FLOW	3D & 2D
GPS	V-NODE-CNTL	Point
GRAS	V-NODE-GRND	Point
INLET	V-NODE-STRM	Point
RIPR	V-RRAP	2D Pline
SHLD	V-ROAD-SHLD	3D & 2D
SIGN	V-NODE-SIGN	Point
SPIL	V-STRM-DTCH	3D & 2D
SW	V-SWLK-CONC	2D Pline
WMH	V-WATR-MHOL	Point

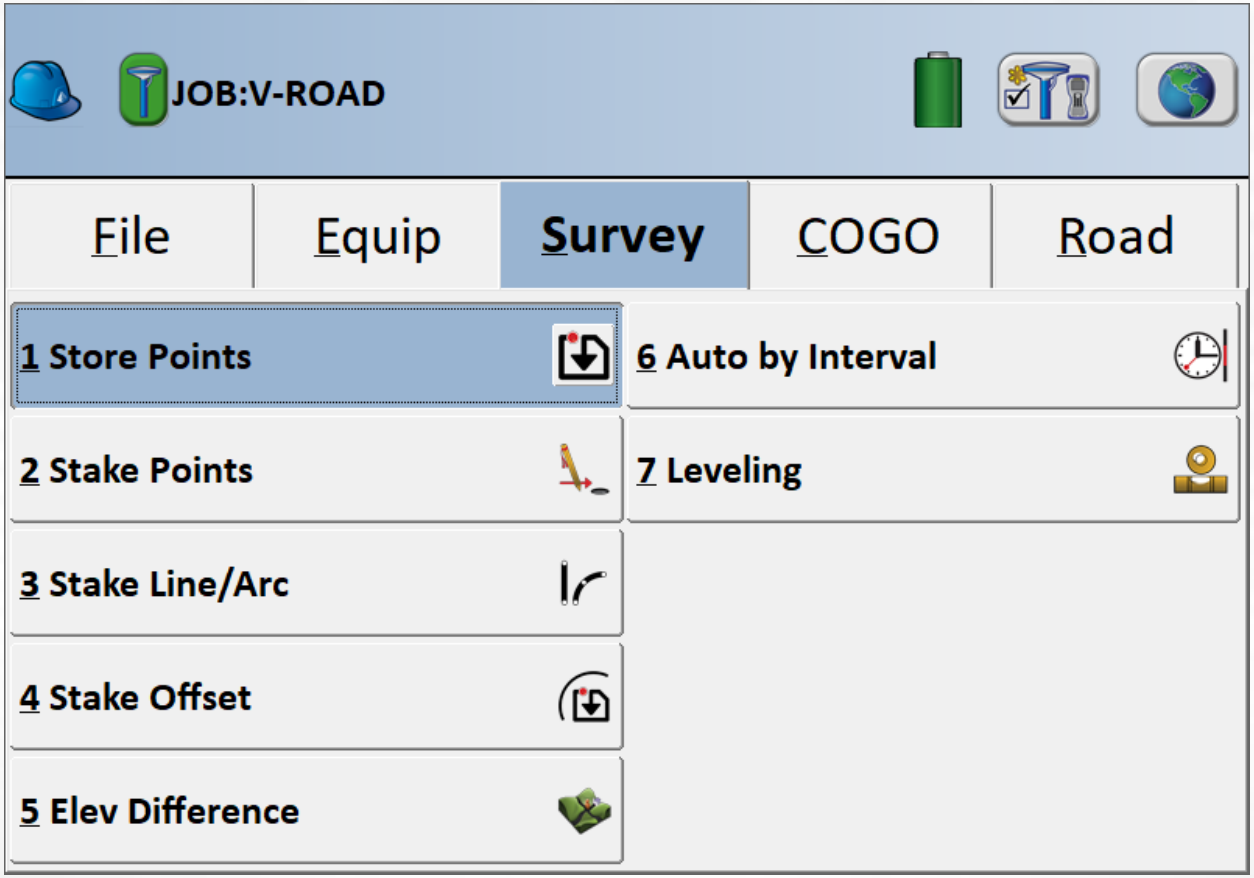
Roads – Step by Step



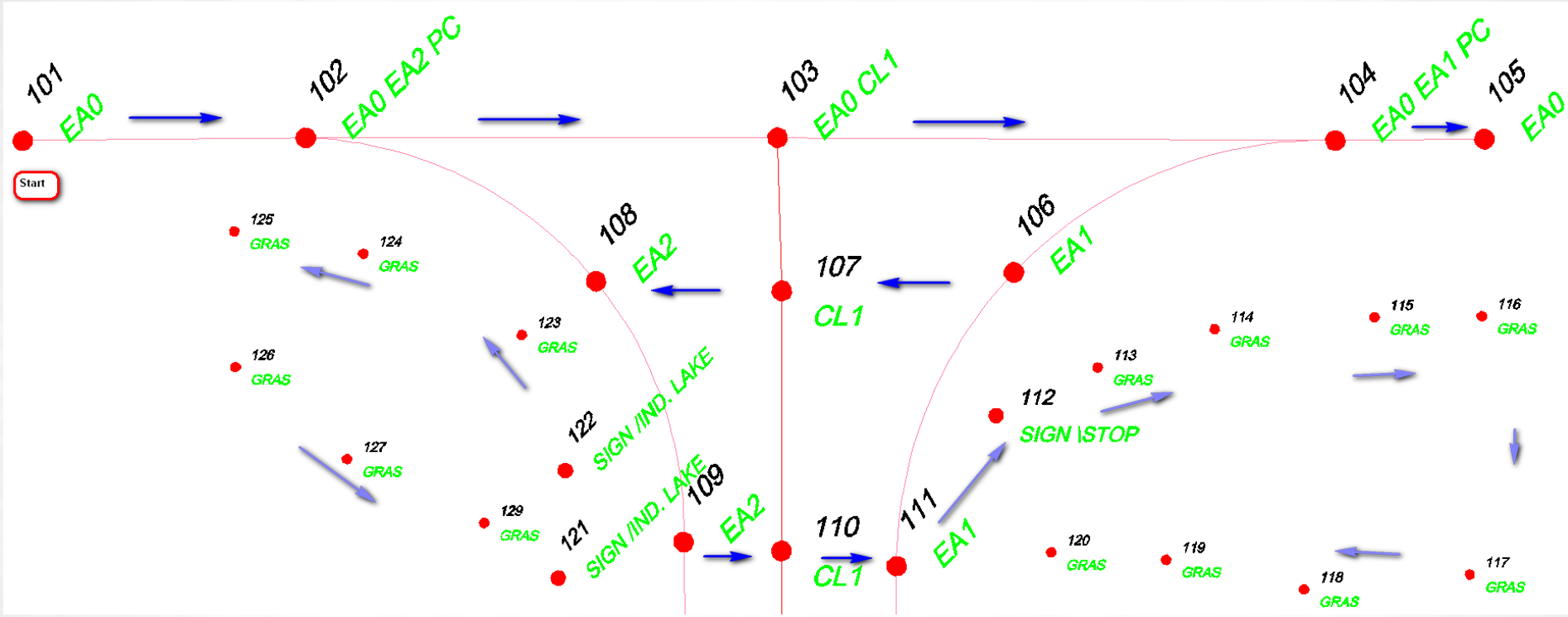
Roads – Step by Step



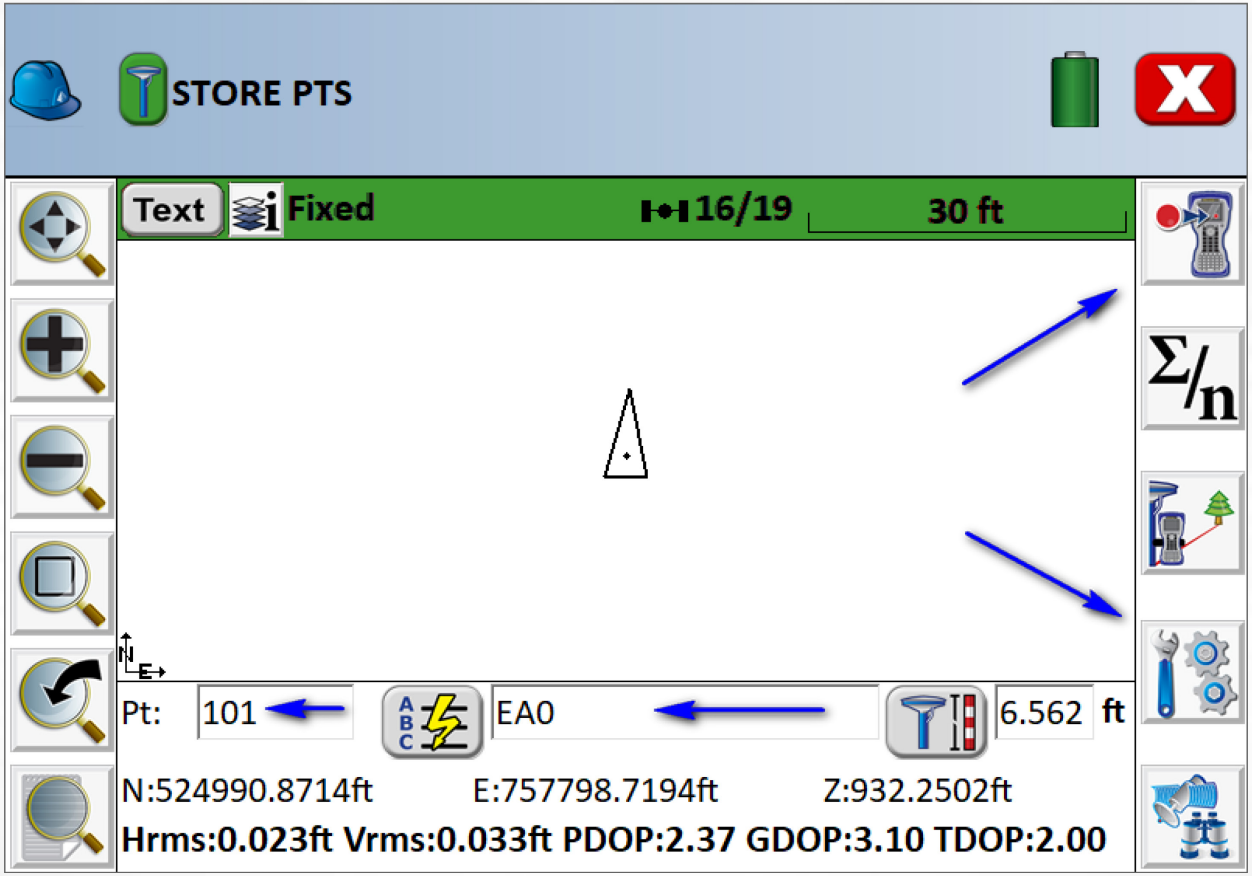
Roads – Step by Step



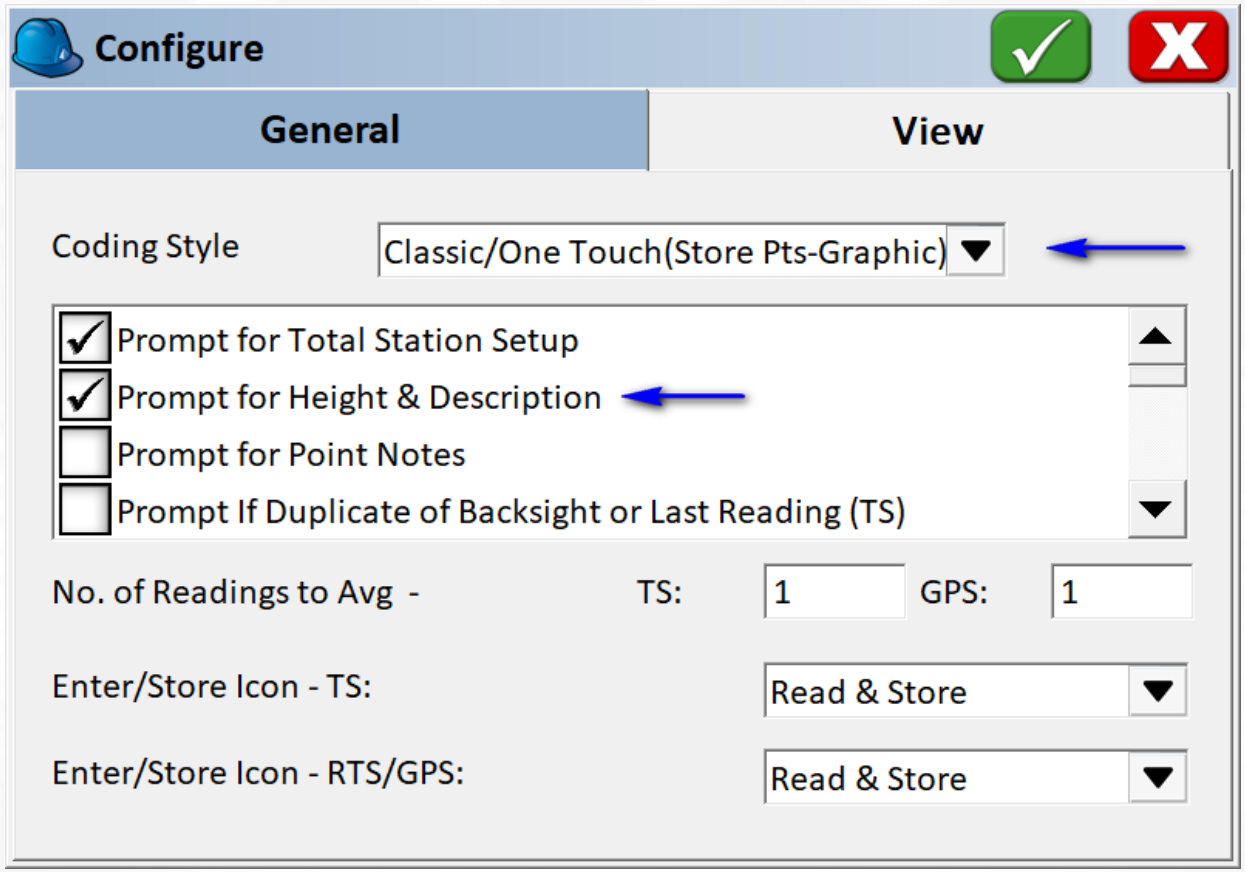
Roads – Step by Step



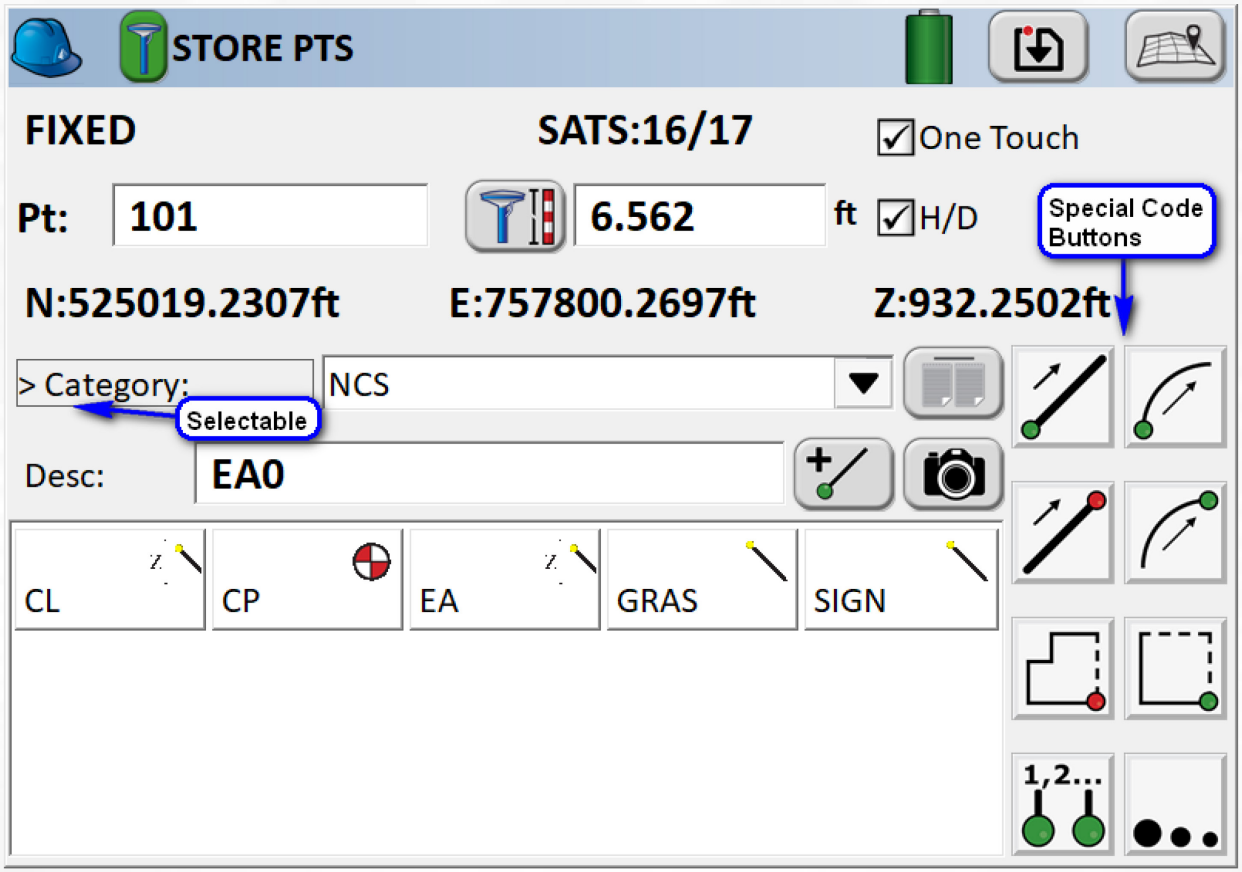
Roads – Step by Step



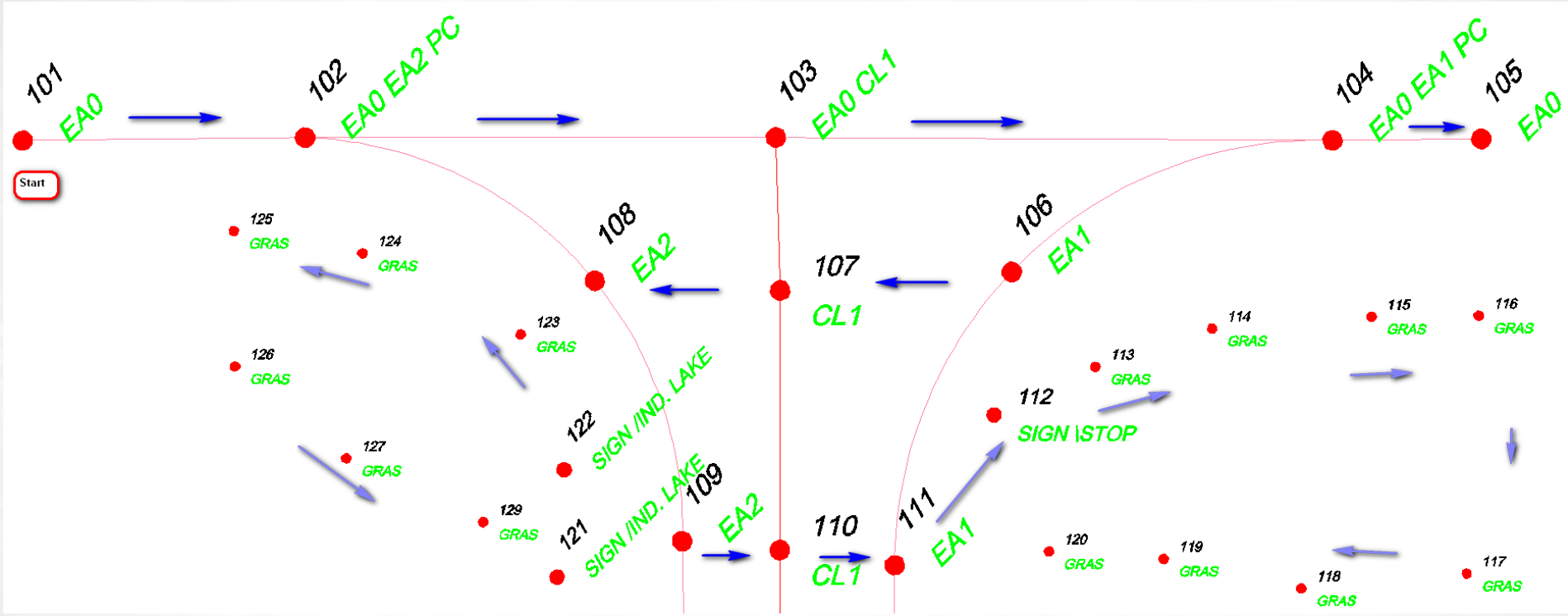
Roads – Step by Step



Roads – Step by Step



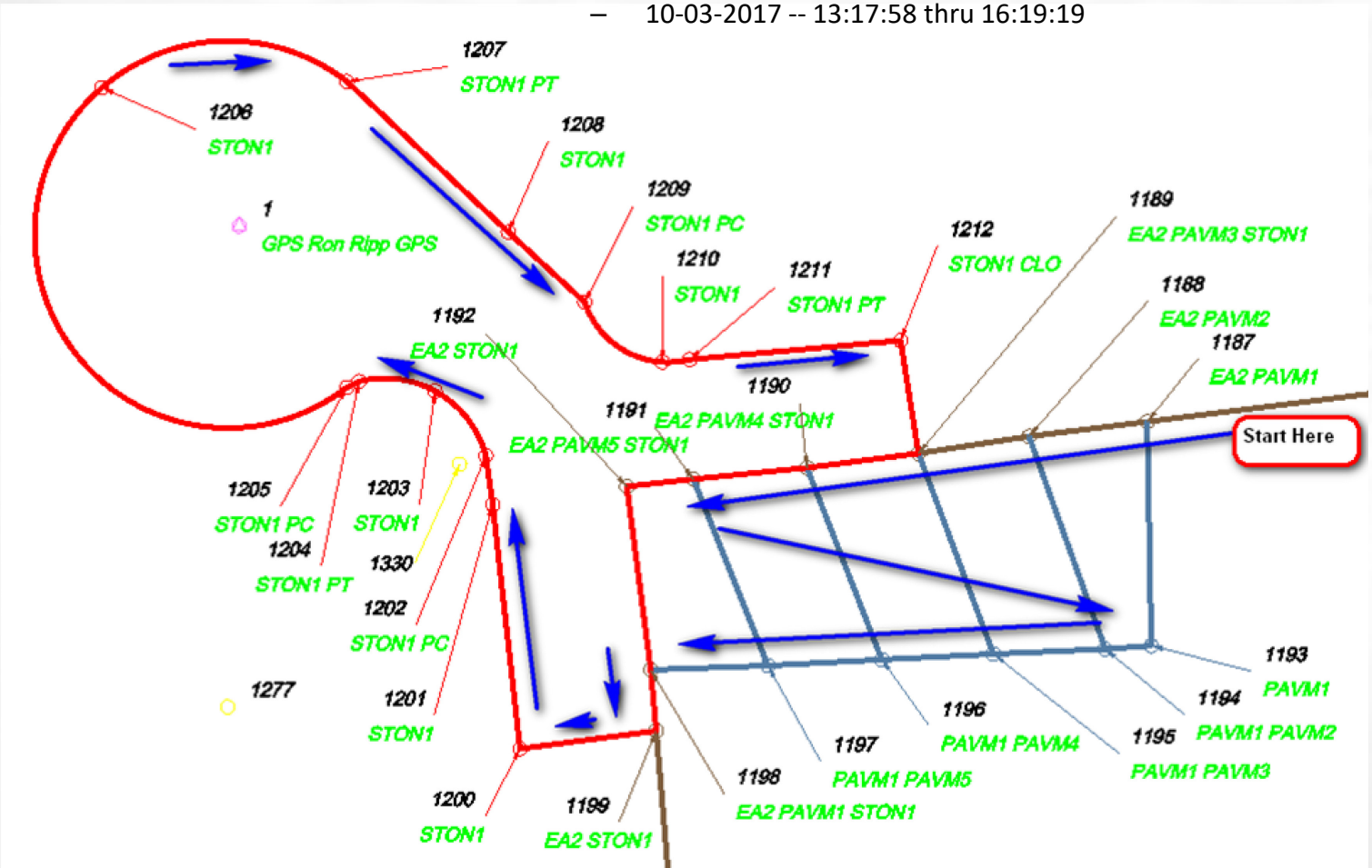
Roads – Step by Step



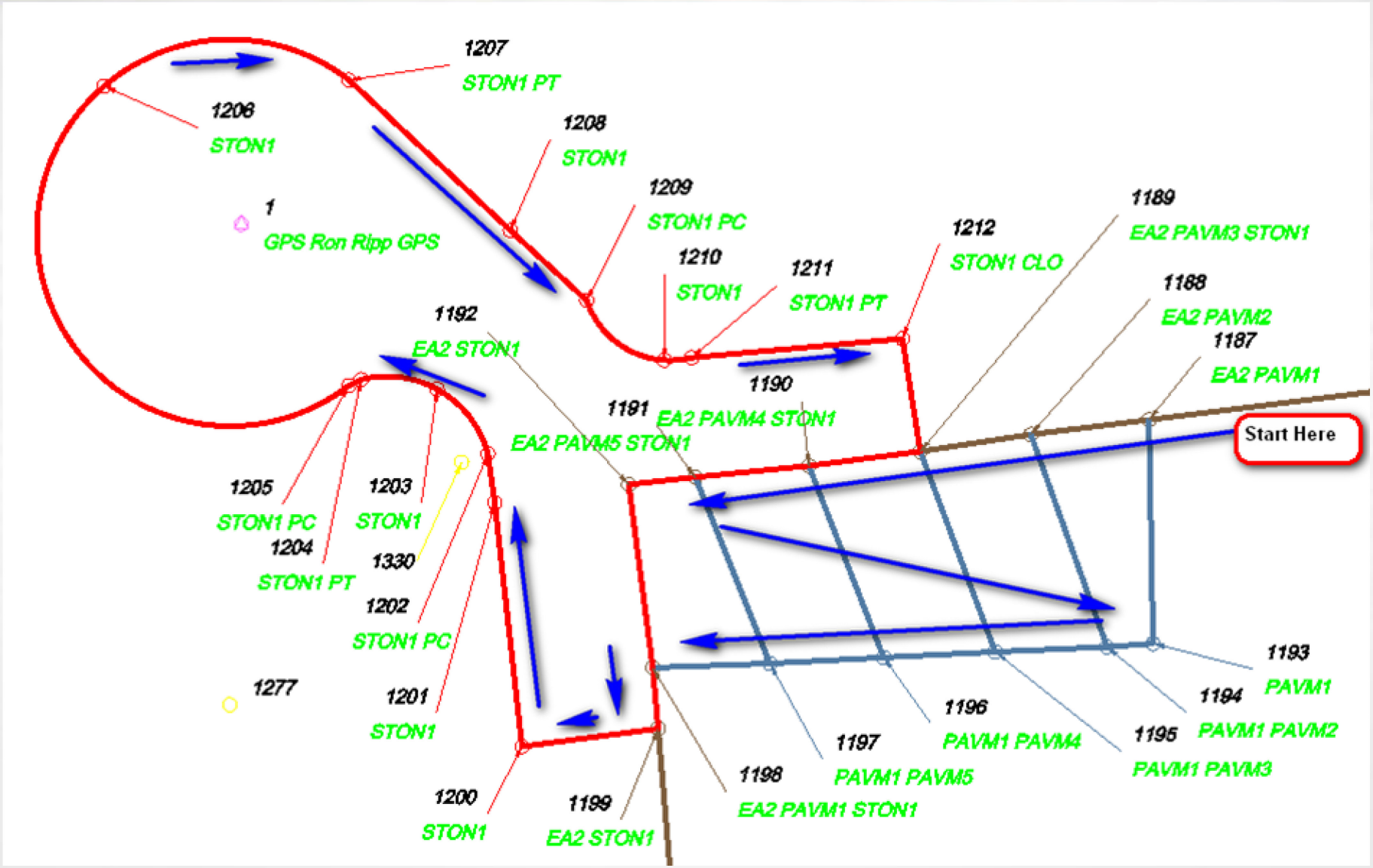
Carlson™

Site – Meta Data

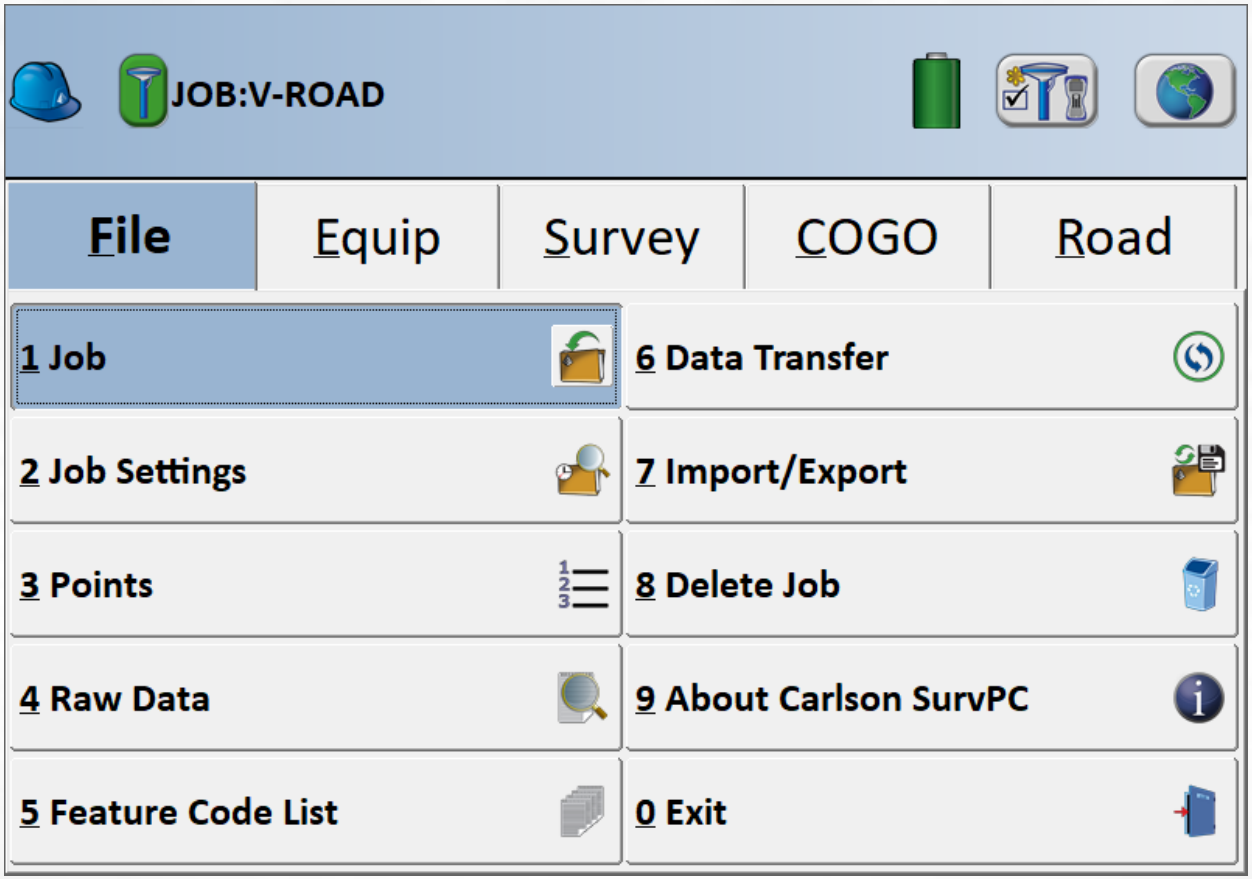
- WGS 84 UTM – Specified with County GIS Concepts in Mind
- Date Gathered:
  - 10-03-2017 -- 13:17:58 thru 16:19:19
- Point Range:
  - 1001 – 1330



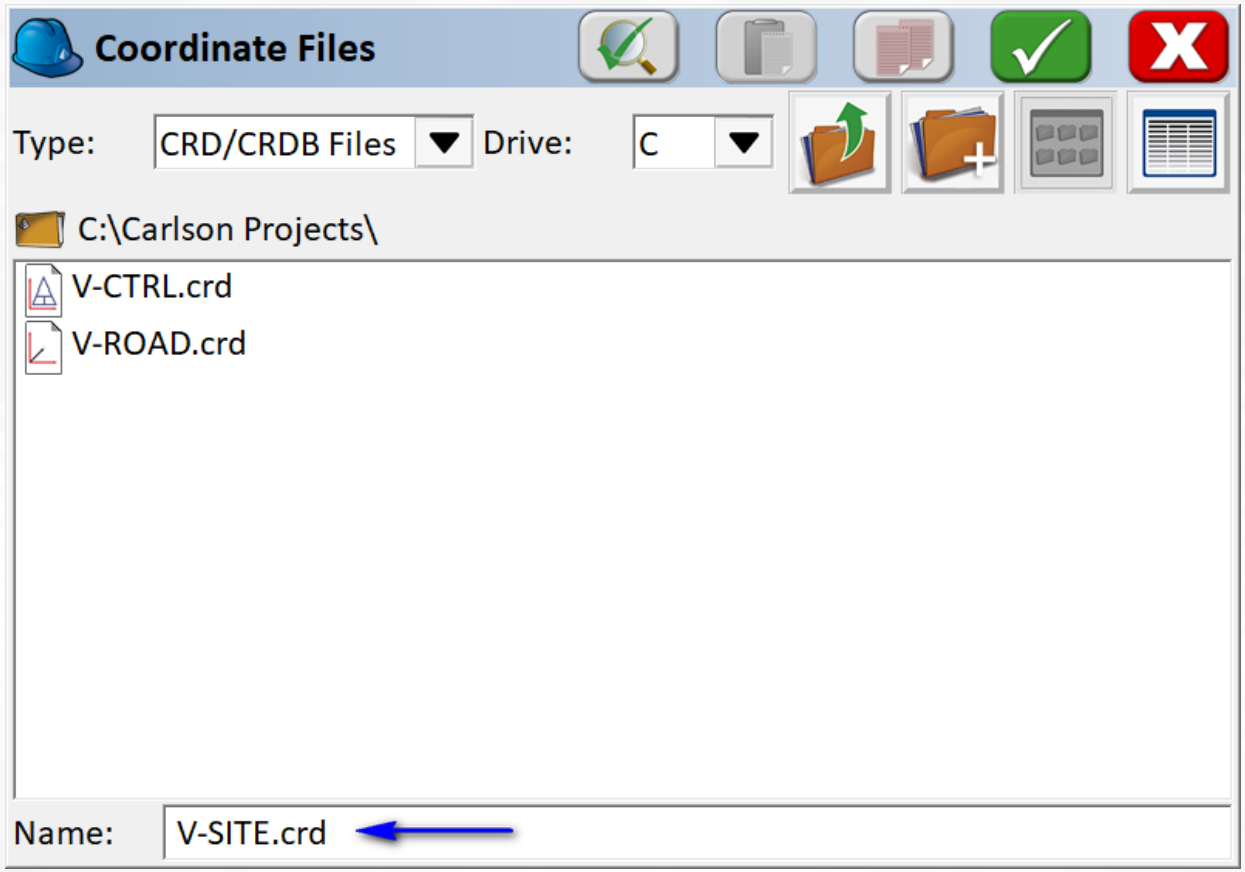
Site – Step by Step



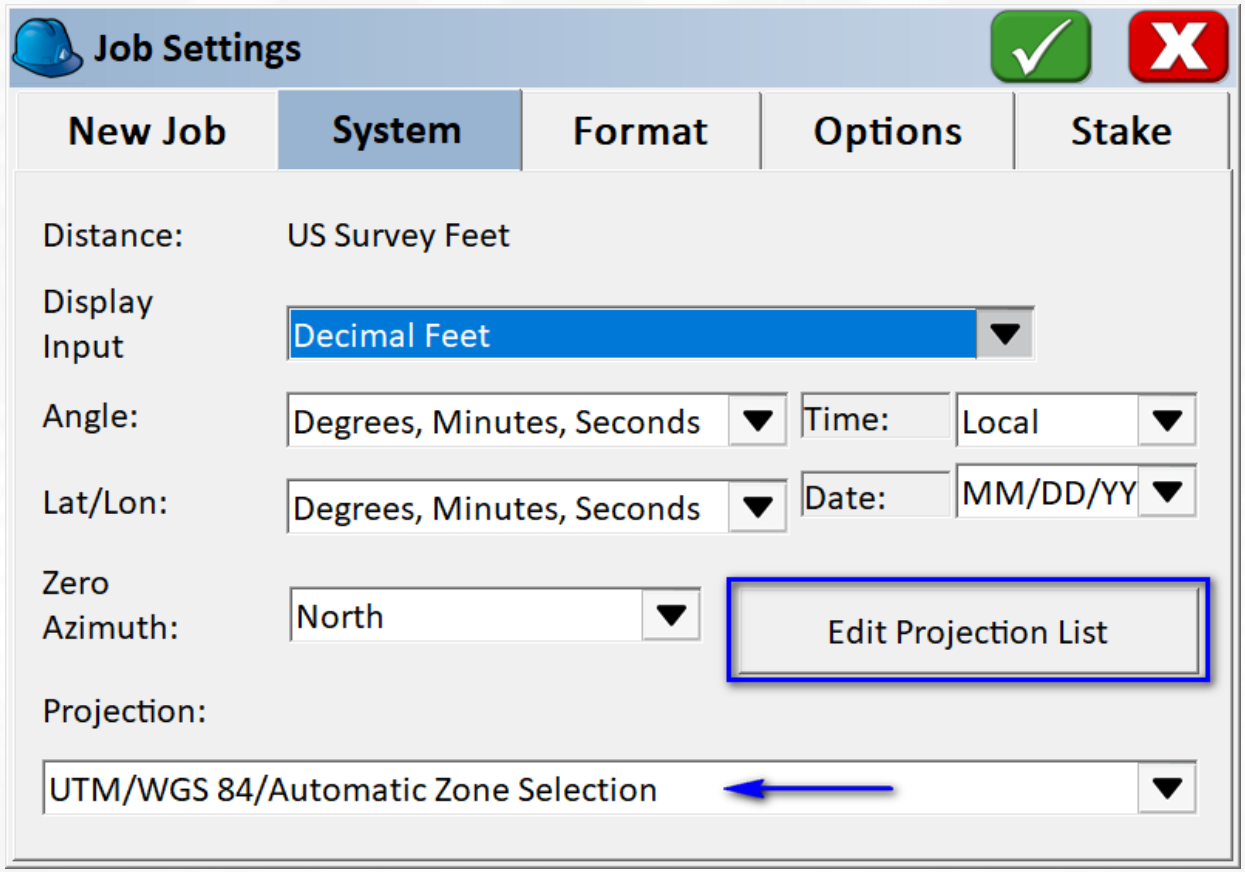
Site – Step by Step



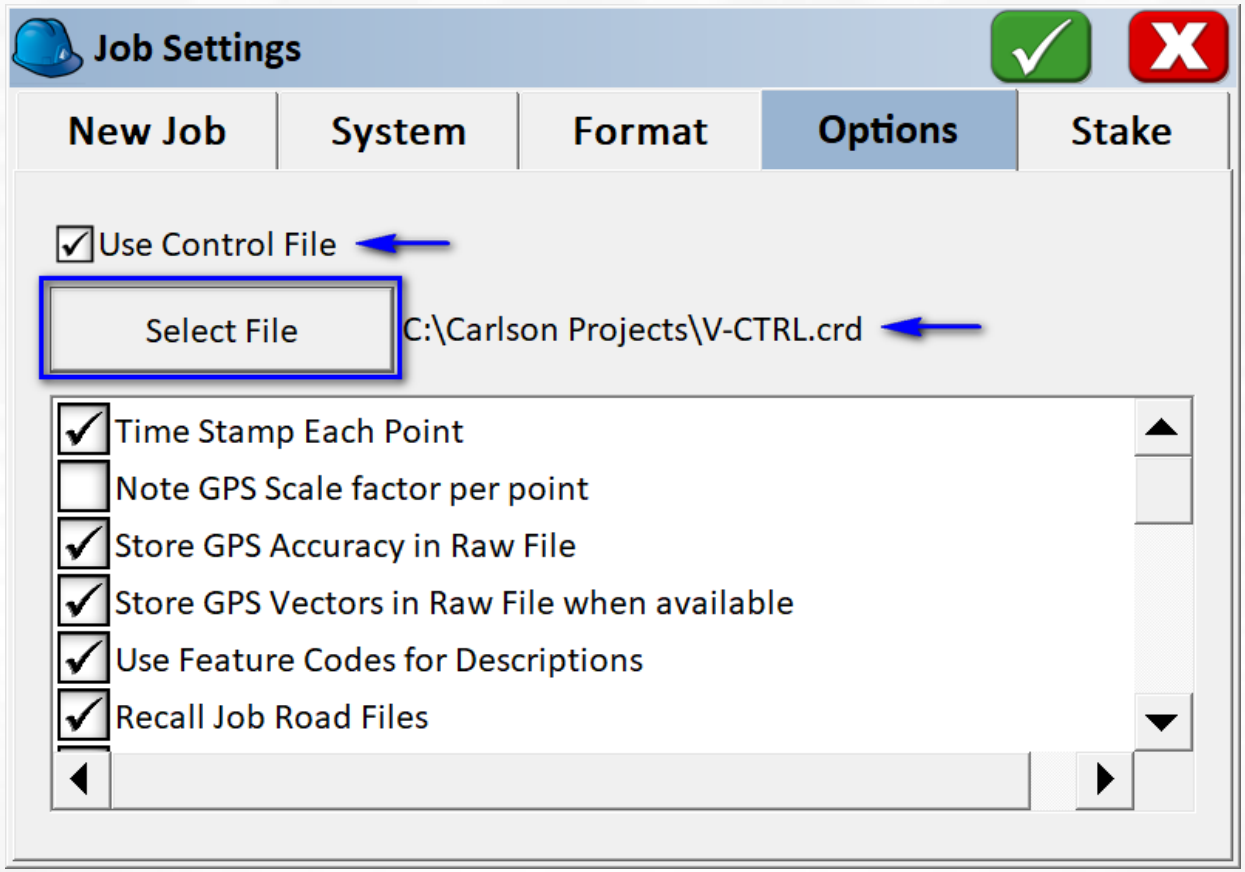
Site – Step by Step



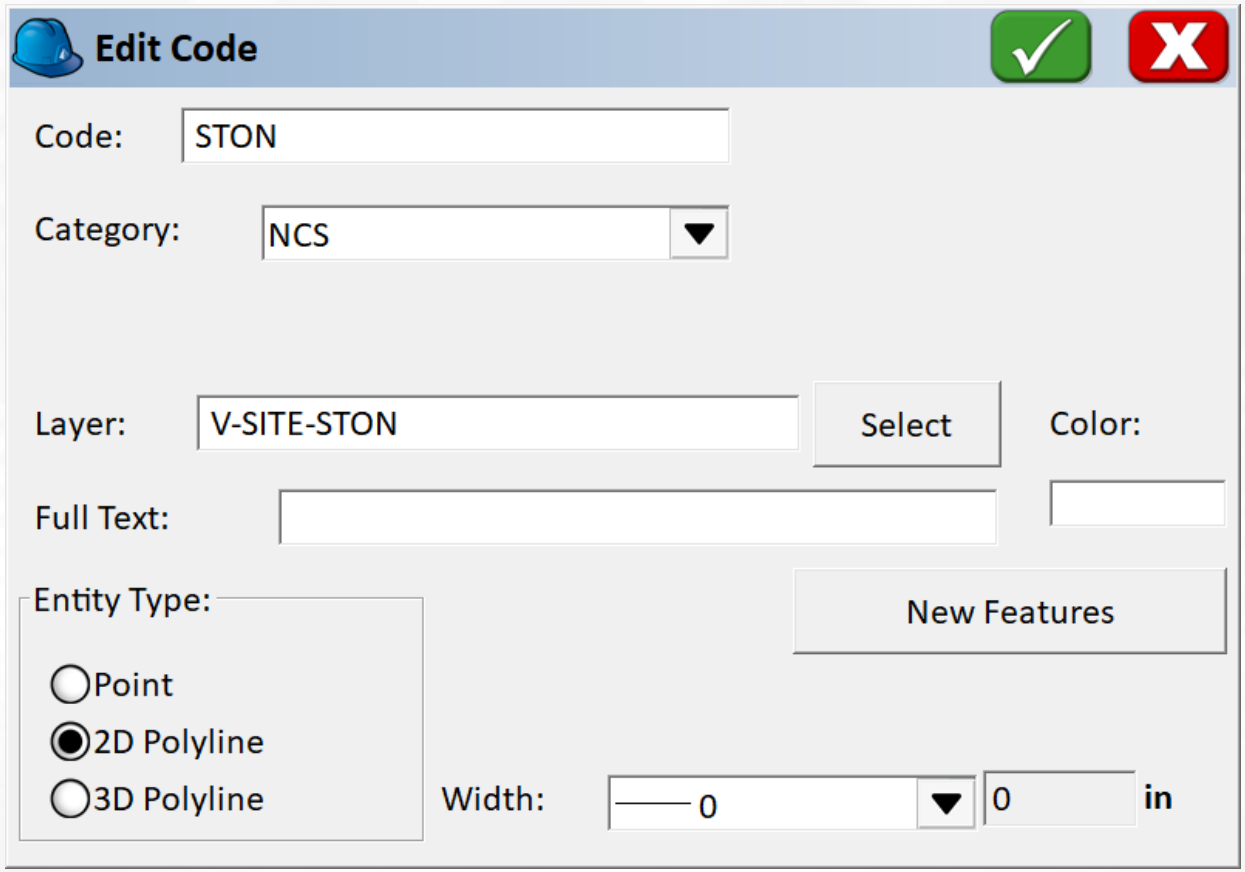
Site – Step by Step



Site – Step by Step



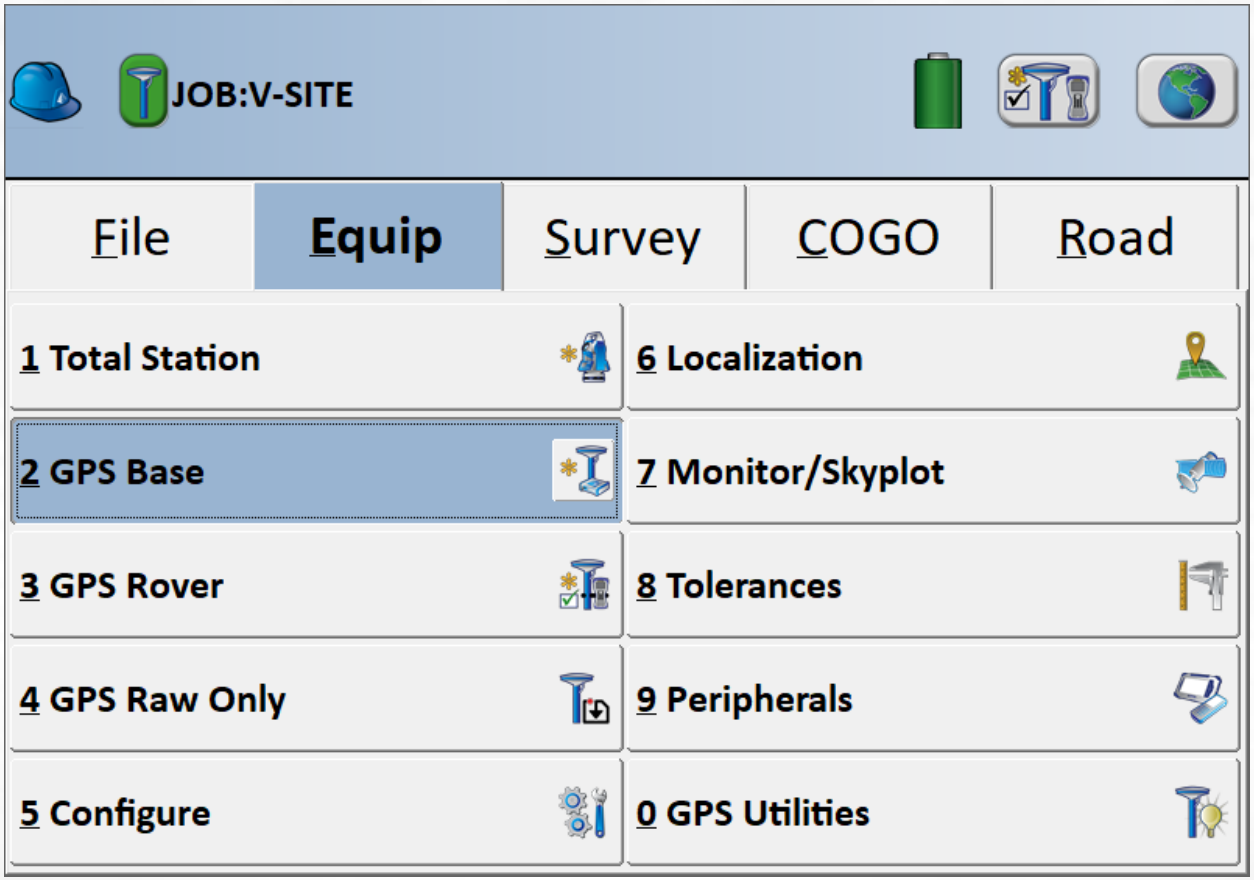
Site – Step by Step



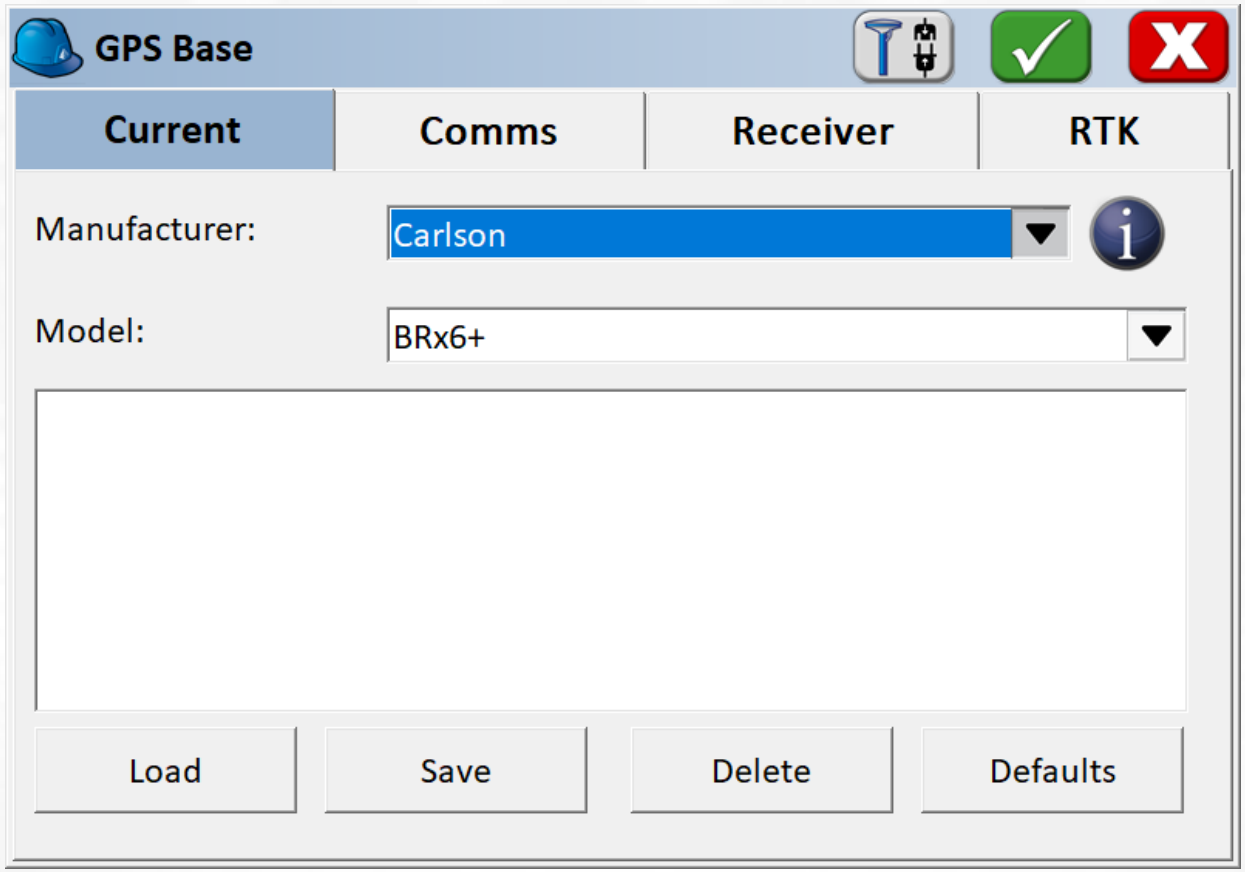
Site – Step by Step

Code	Layer	Entity
ASPH	V-ROAD-ASPH	3D & 2D
BERM	V-BRKL	3D Pline
BLDG	V-BLDG-OTLN	2D Pline
CL	V-ROAD-CNTR	3D & 2D
CP	V-CTRL-HCPT	Point
DTRE	V-NODE-TREE	Point
EA	V-ROAD-ASPH	3D & 2D
GPS	V-NODE-CNTL	Point
GRAS	V-NODE-GRND	Point
PAVM	V-PKNG-MRKG	2D Pline
SHLD	V-ROAD-SHLD	3D & 2D
SIGN	V-NODE-SIGN	Point
STON	V-PKNG-MRKG	2D Pline

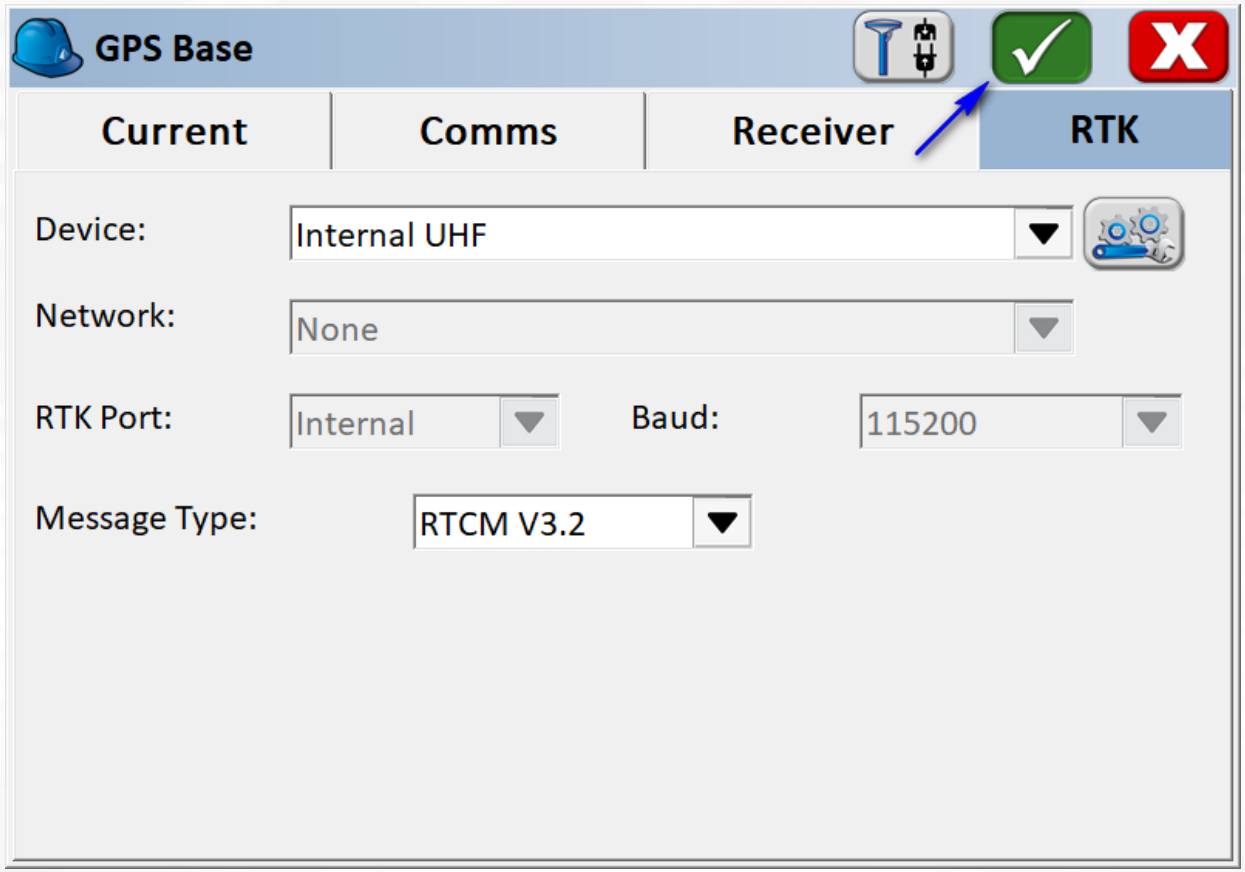
Site – Step by Step



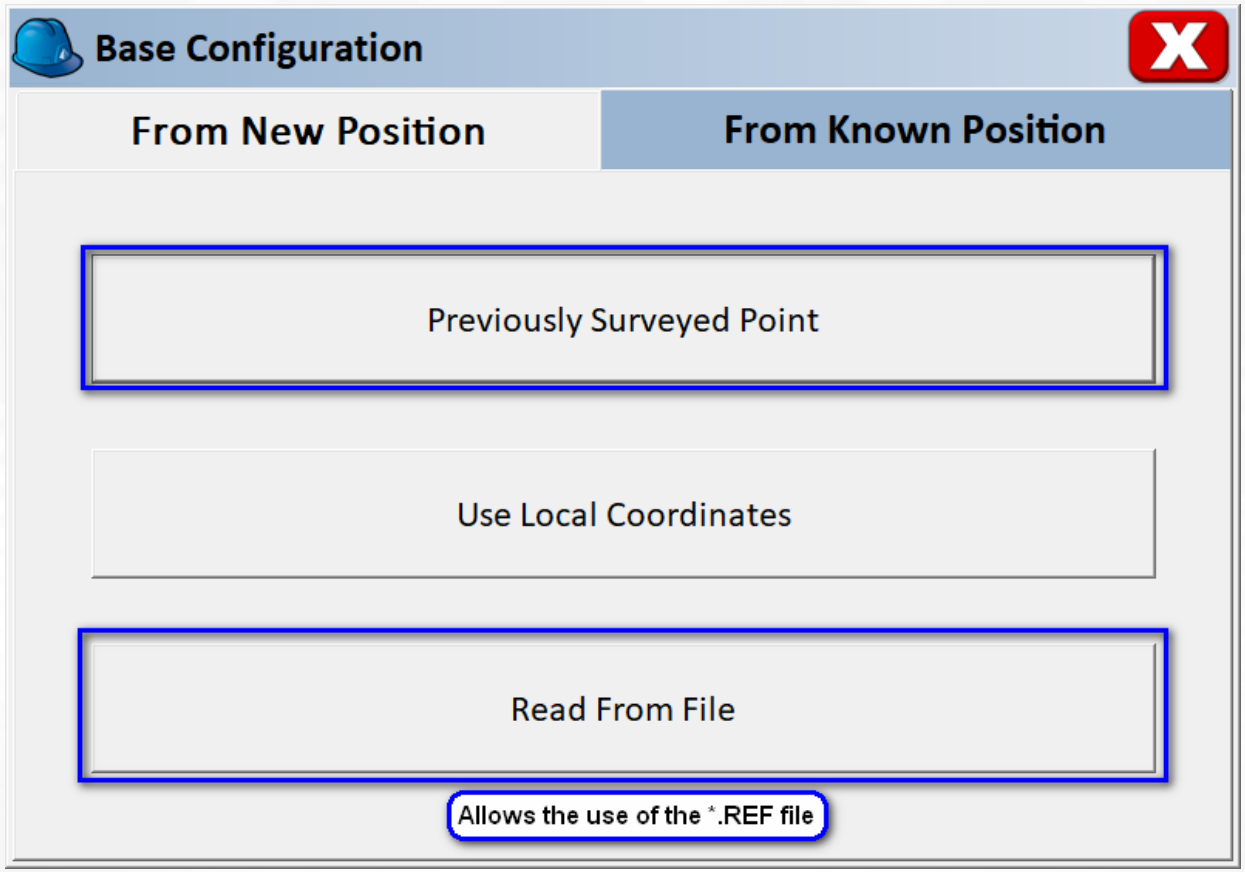
Site – Step by Step



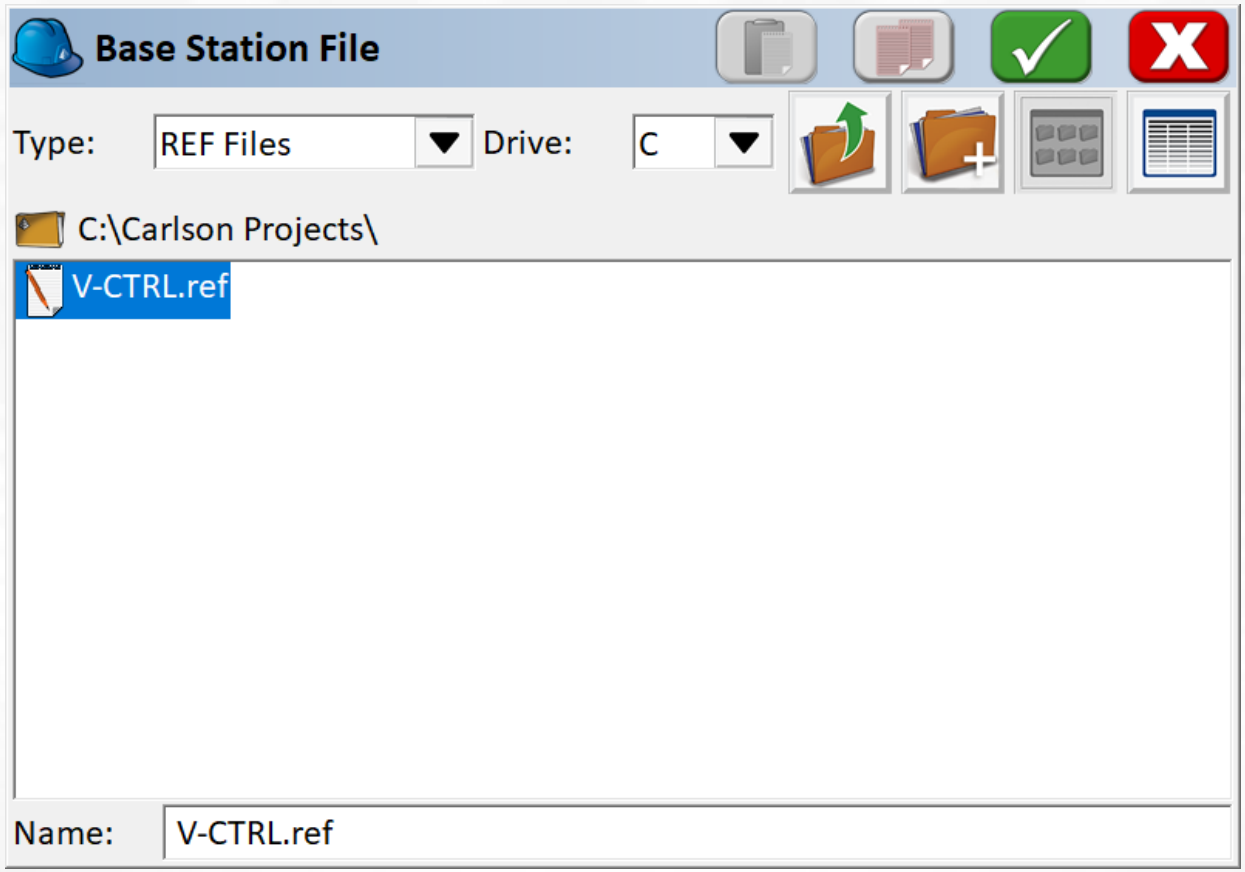
Site – Step by Step



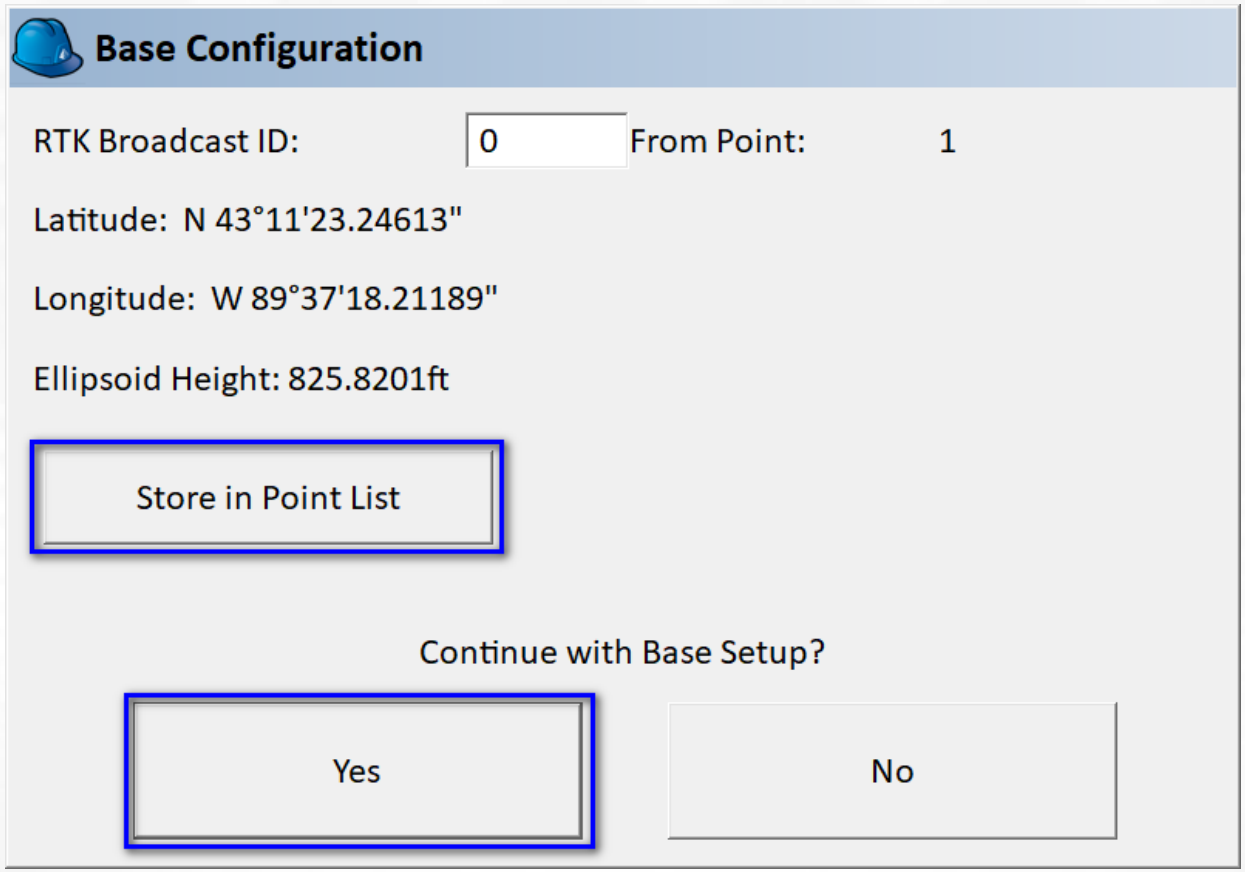
Site – Step by Step



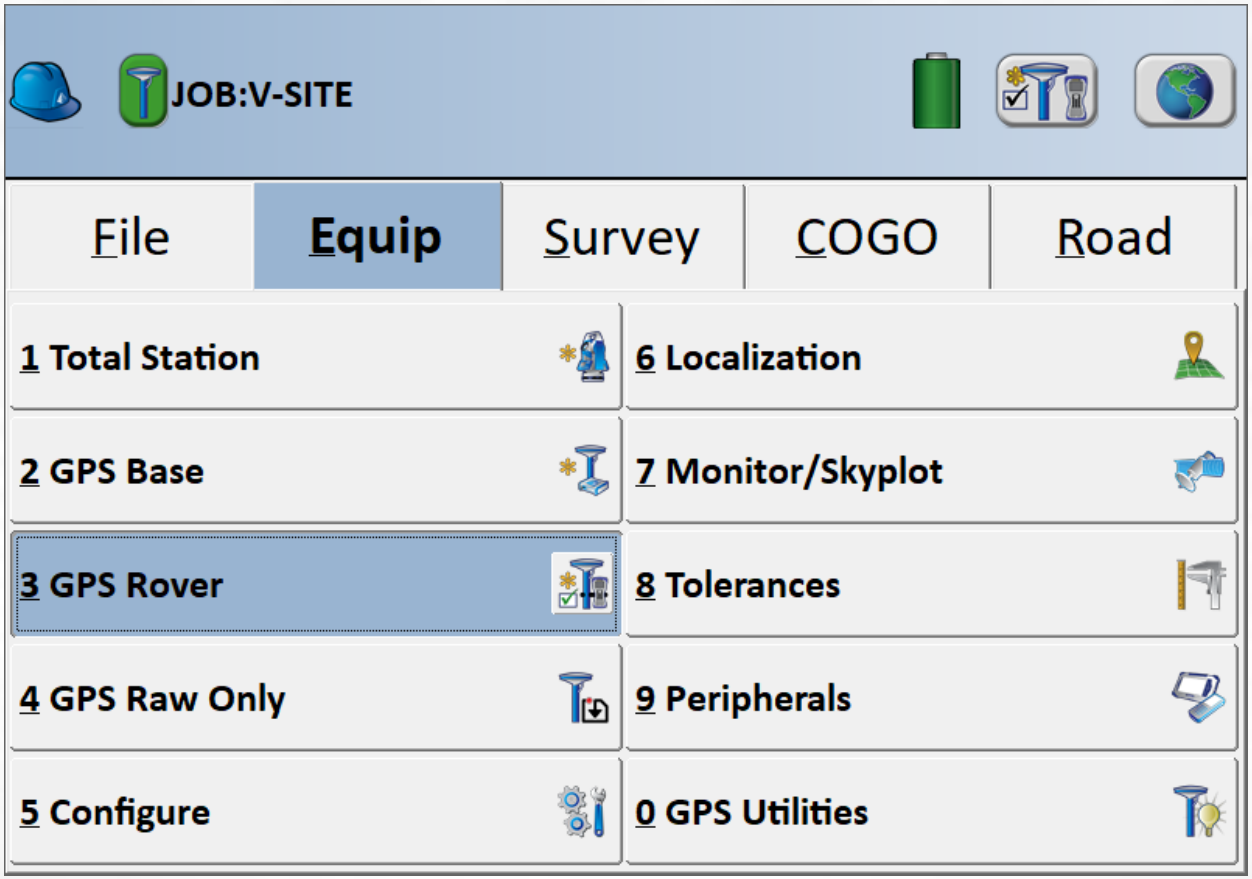
Site – Step by Step



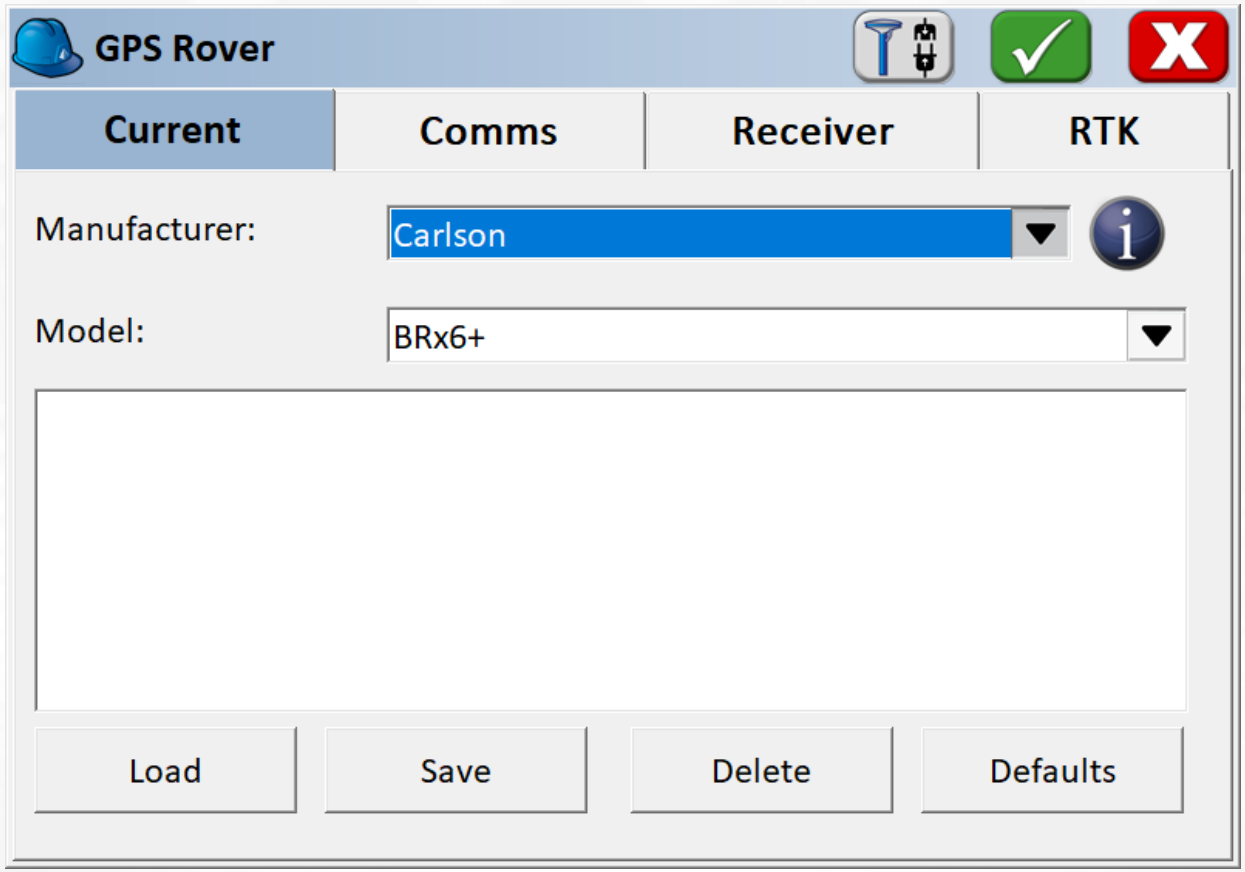
Site – Step by Step



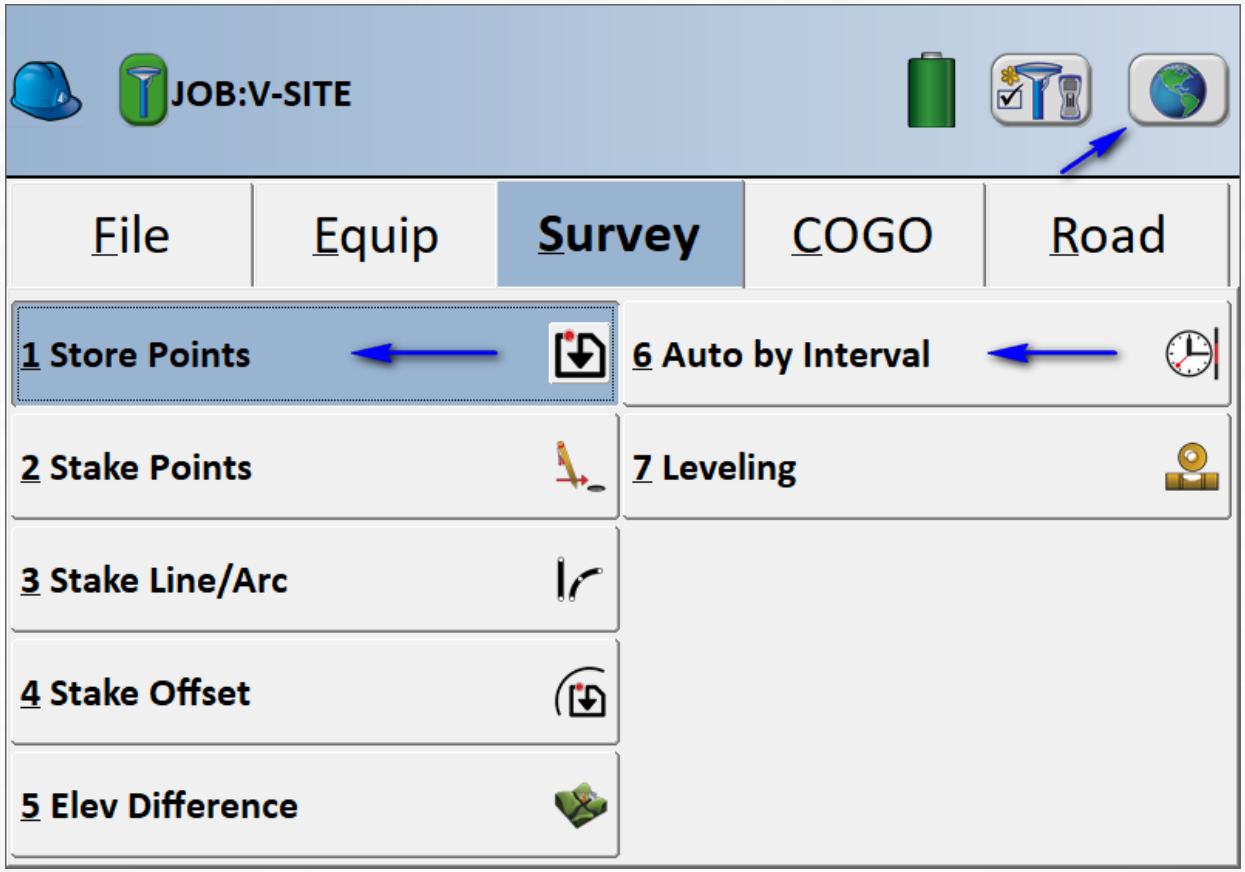
Site – Step by Step



Site – Step by Step



Site – Step by Step



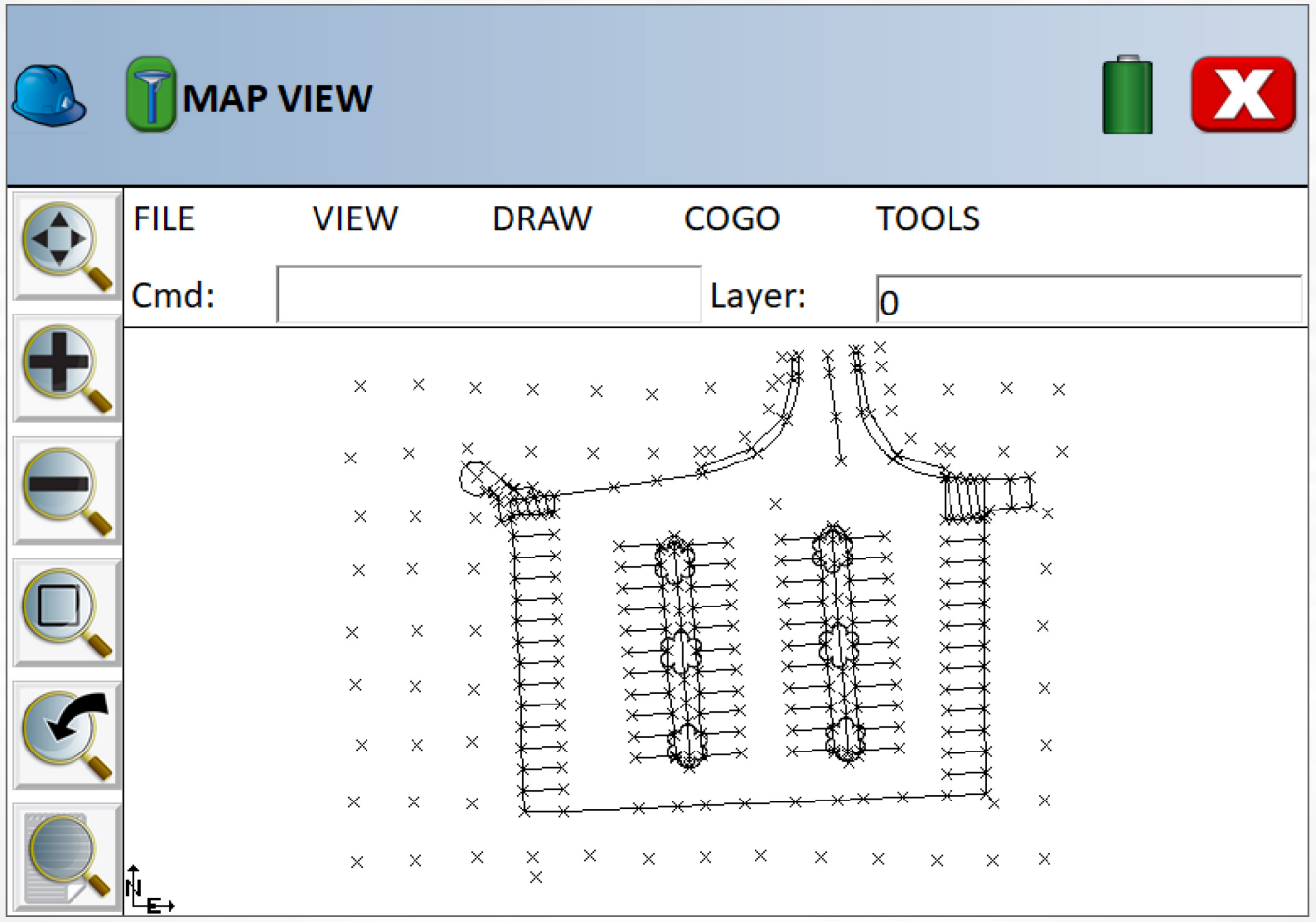
Site – Step by Step

Code	Desc	Code	Desc	Code	Desc	Code	Desc
1076	PAVM52	1089	EA4 PAVM61	1101	EA4 PT PAVM51	1115	EA4 CLO PAVM62
1077	PAVM53	1090	EA4 PAVM60	1102	EA4 PAVM50	1118	PAVM41
1078	PAVM54	1091	EA4 PAVM59	1103	EA4 PAVM49	1119	PAVM42
1079	PAVM55	1092	EA4 PAVM58	1104	EA4 PAVM48	1120	PAVM43
1080	PAVM56	1093	EA4 PAVM57	1105	EA4 PAVM47	1121	PAVM44
1081	PAVM57	1094	EA4 PAVM56	1106	EA4 PAVM46	1122	PAVM45
1082	PAVM58	1095	EA4 PAVM55	1107	EA4 PAVM45	1123	PAVM46
1083	PAVM59	1096	EA4 PAVM54	1108	EA4 PAVM44	1124	PAVM47
1084	PAVM60	1097	EA4 PAVM53	1109	EA4 PAVM43	1125	PAVM48
1085	PAVM61	1098	EA4 PAVM52	1110	EA4 PAVM42	1126	PAVM49
1086	PAVM62	1099	EA4 PC	1111	EA4 PAVM41	1127	PAVM50
				**	**See Next Page**	1128	PAVM51

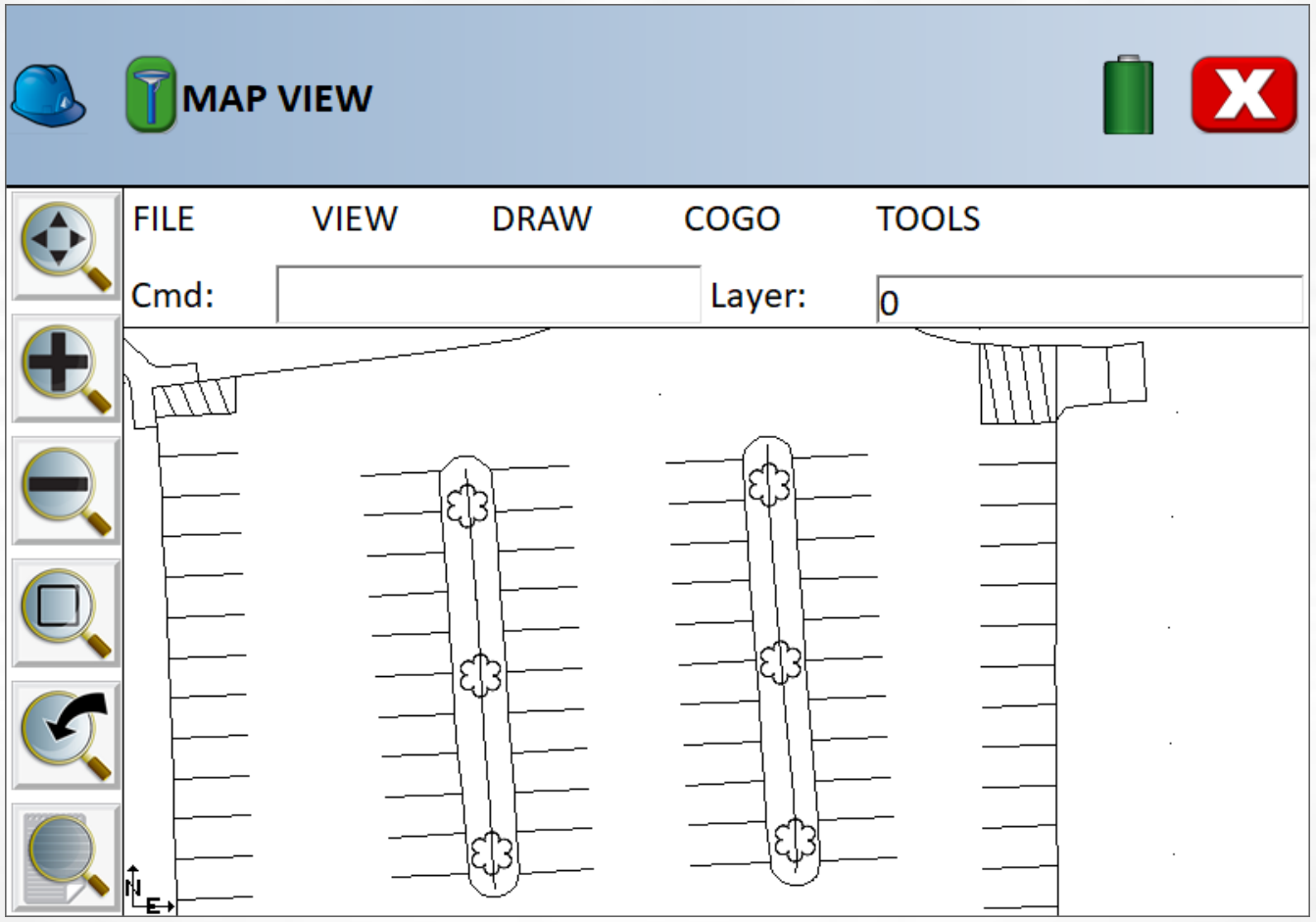
Site – Step by Step

Code	Desc
1112	EA4 PC
1113	EA4
1114	EA4 PT
1246	DTRE SZ6 \Maple
1247	DTRE SZ6 \Maple
1248	DTRE SZ6 \Maple
1249	GRAS
1250	GRAS

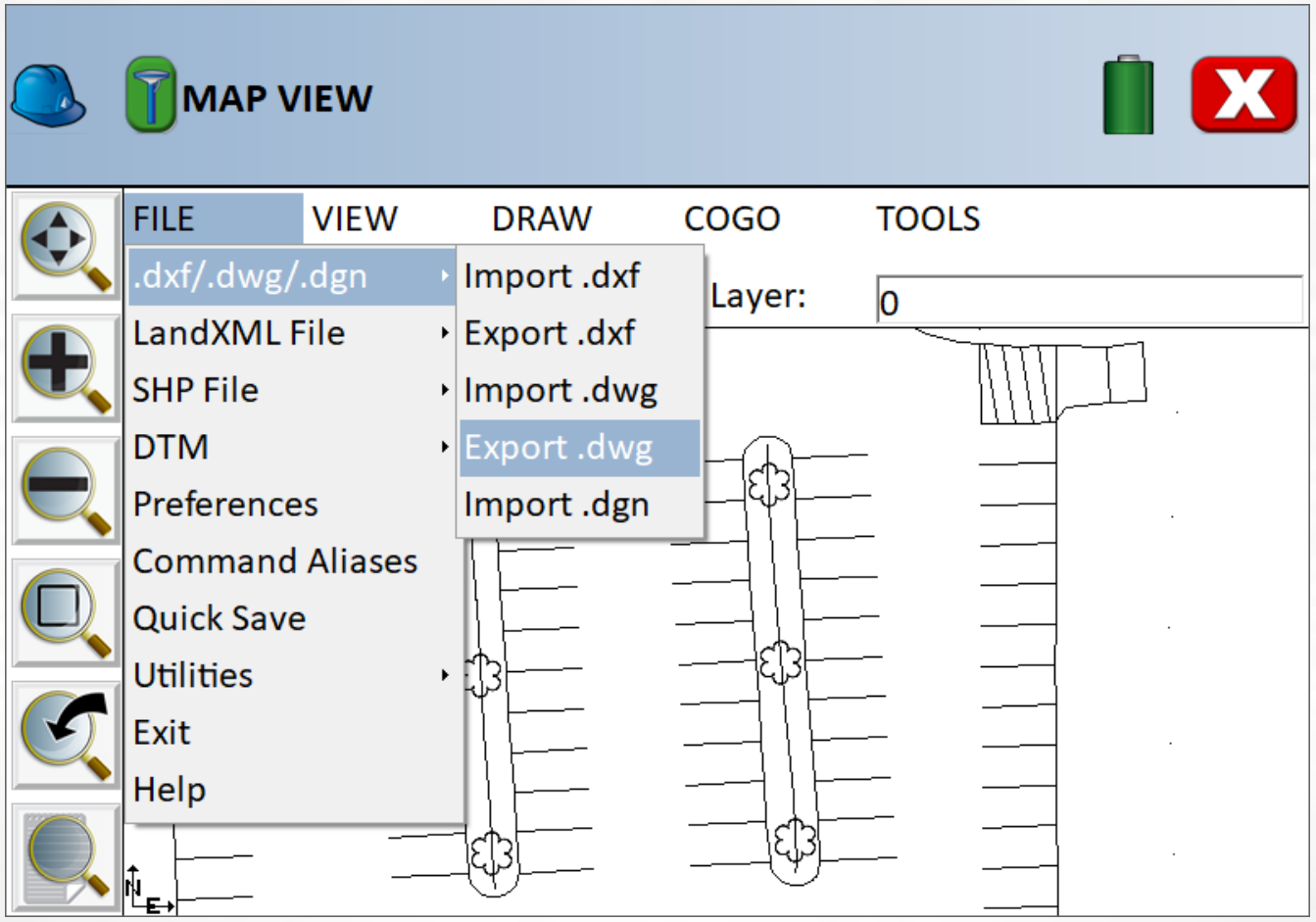
Site – Step by Step



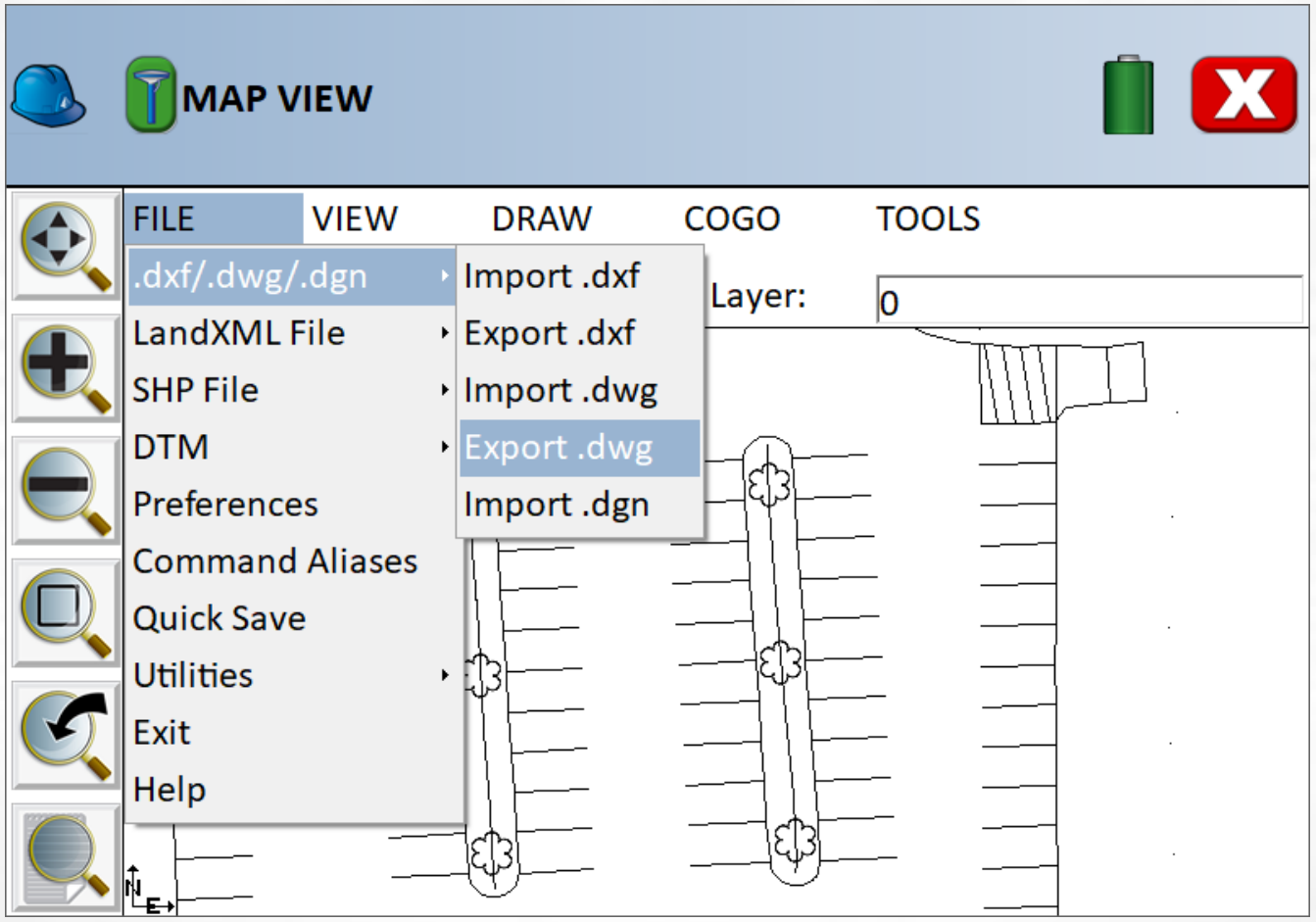
Site – Step by Step



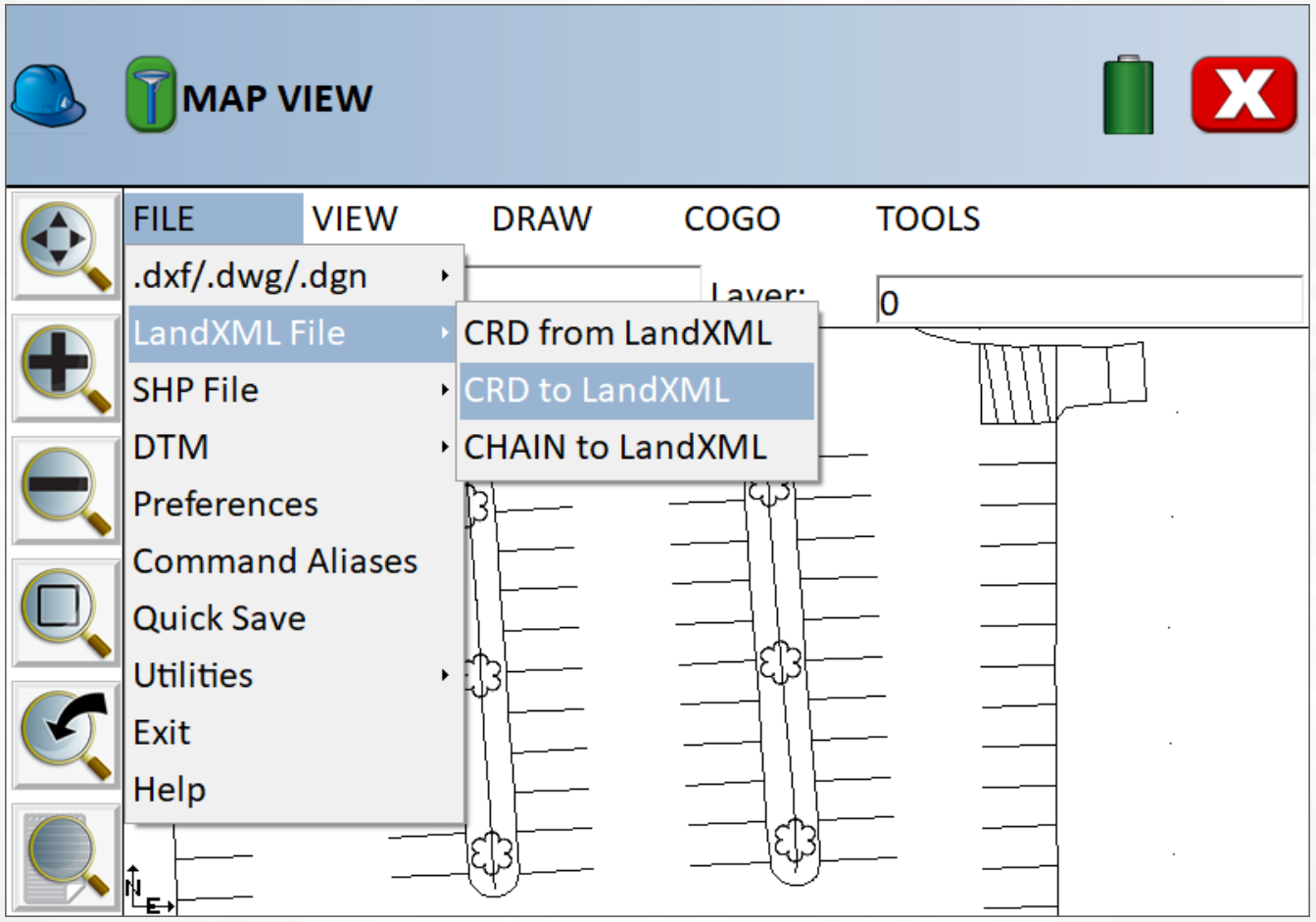
Site – Step by Step



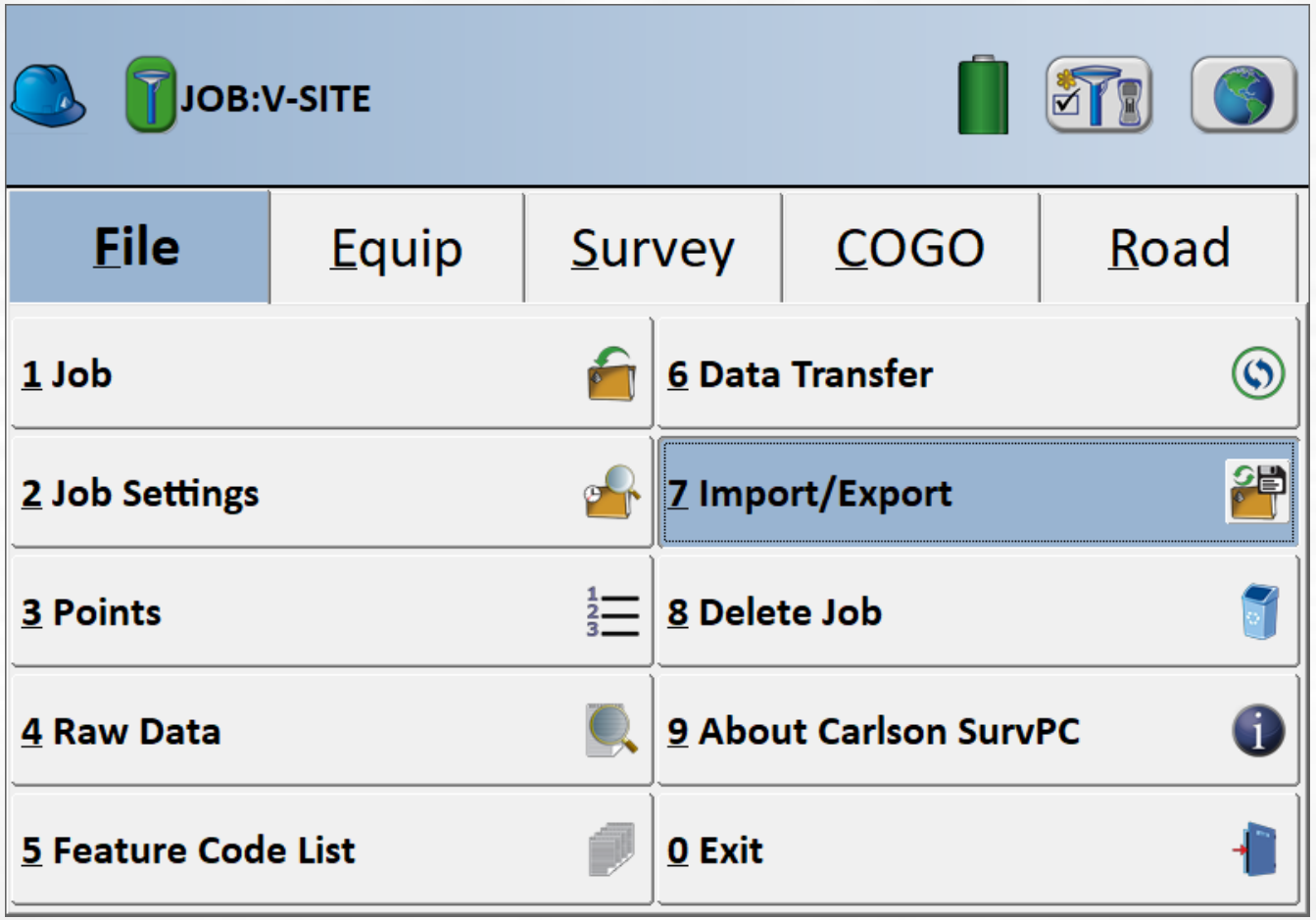
Site – Step by Step



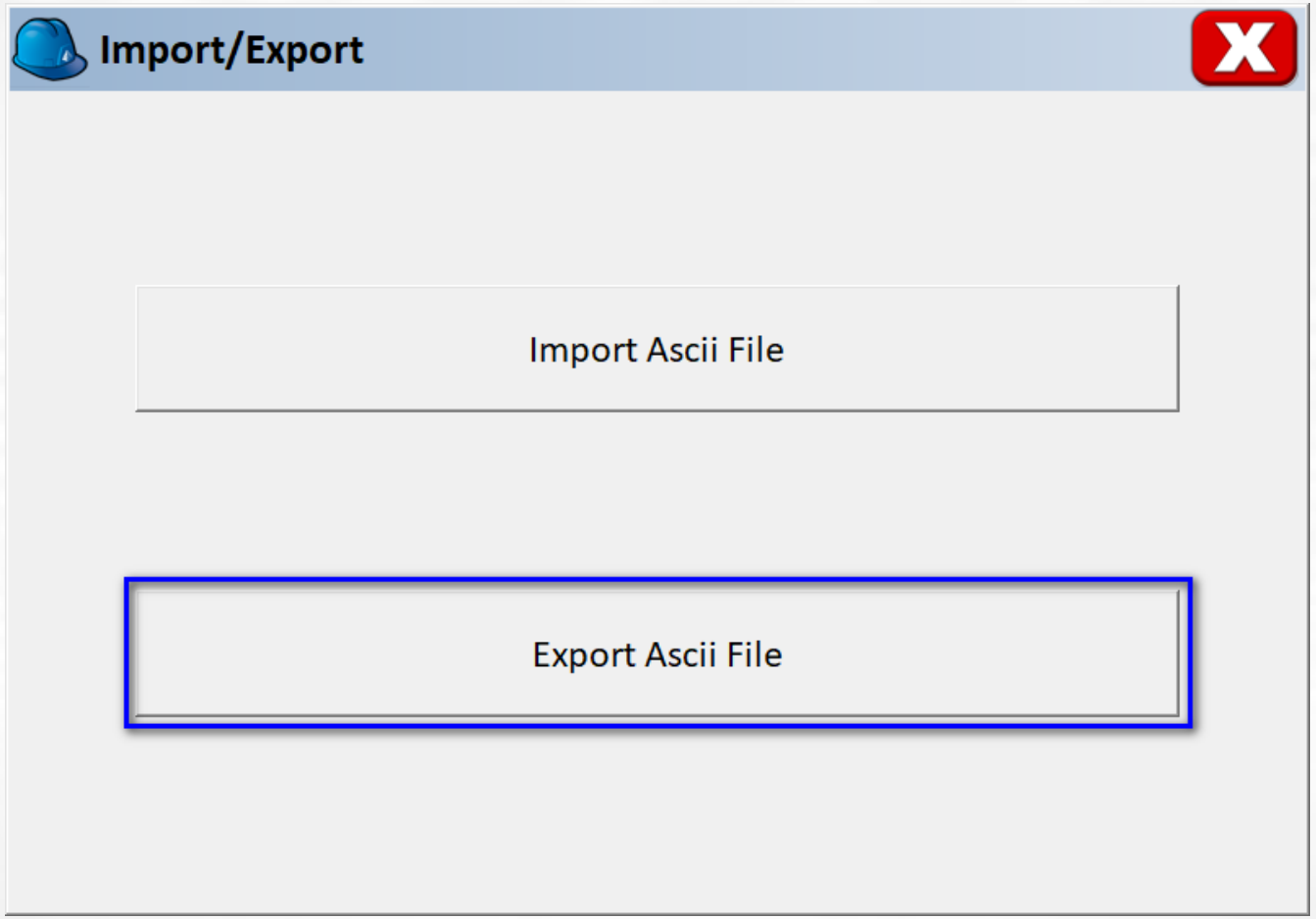
Site – Step by Step



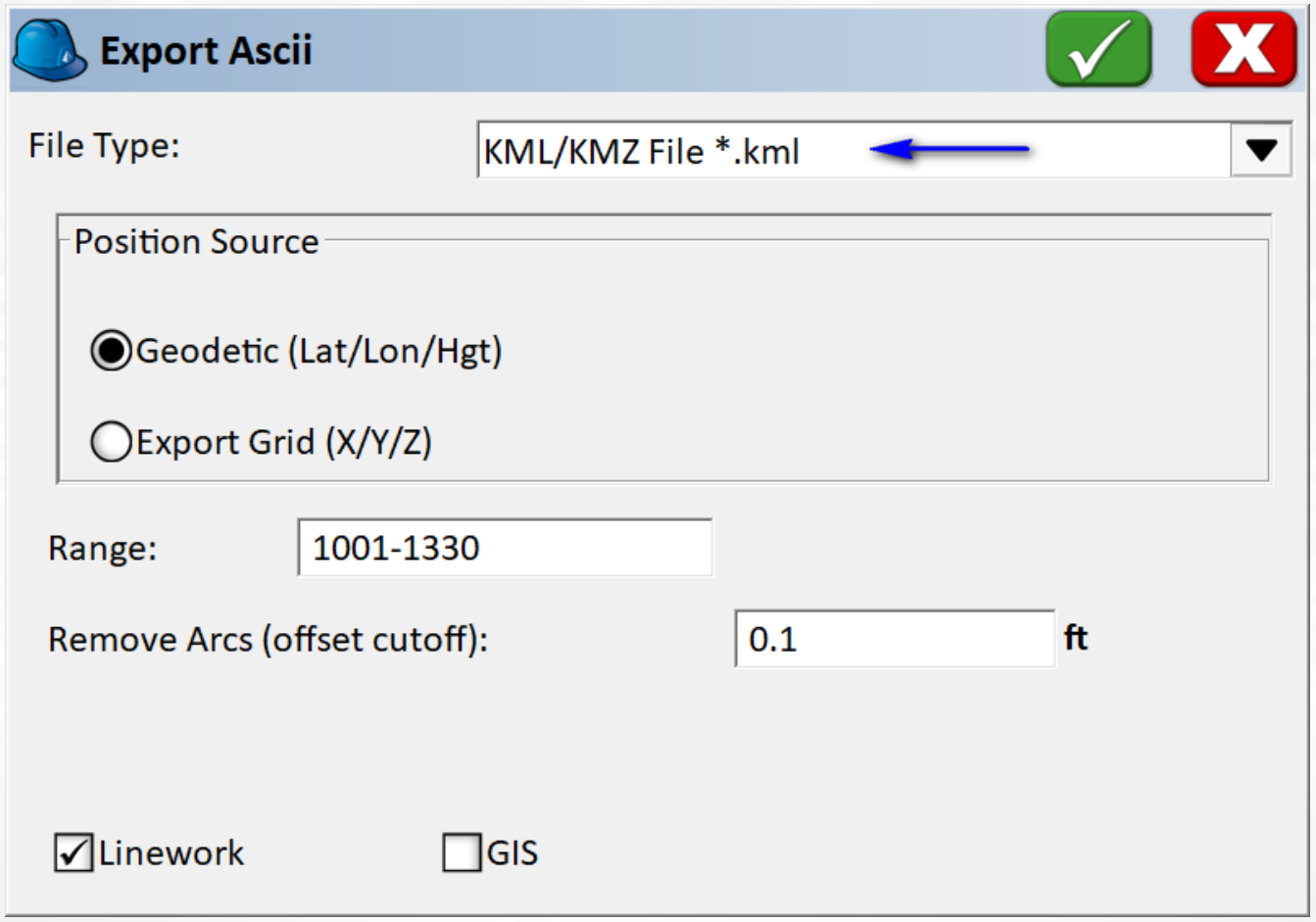
Site – Step by Step



Site – Step by Step



Site – Step by Step



Carlson™

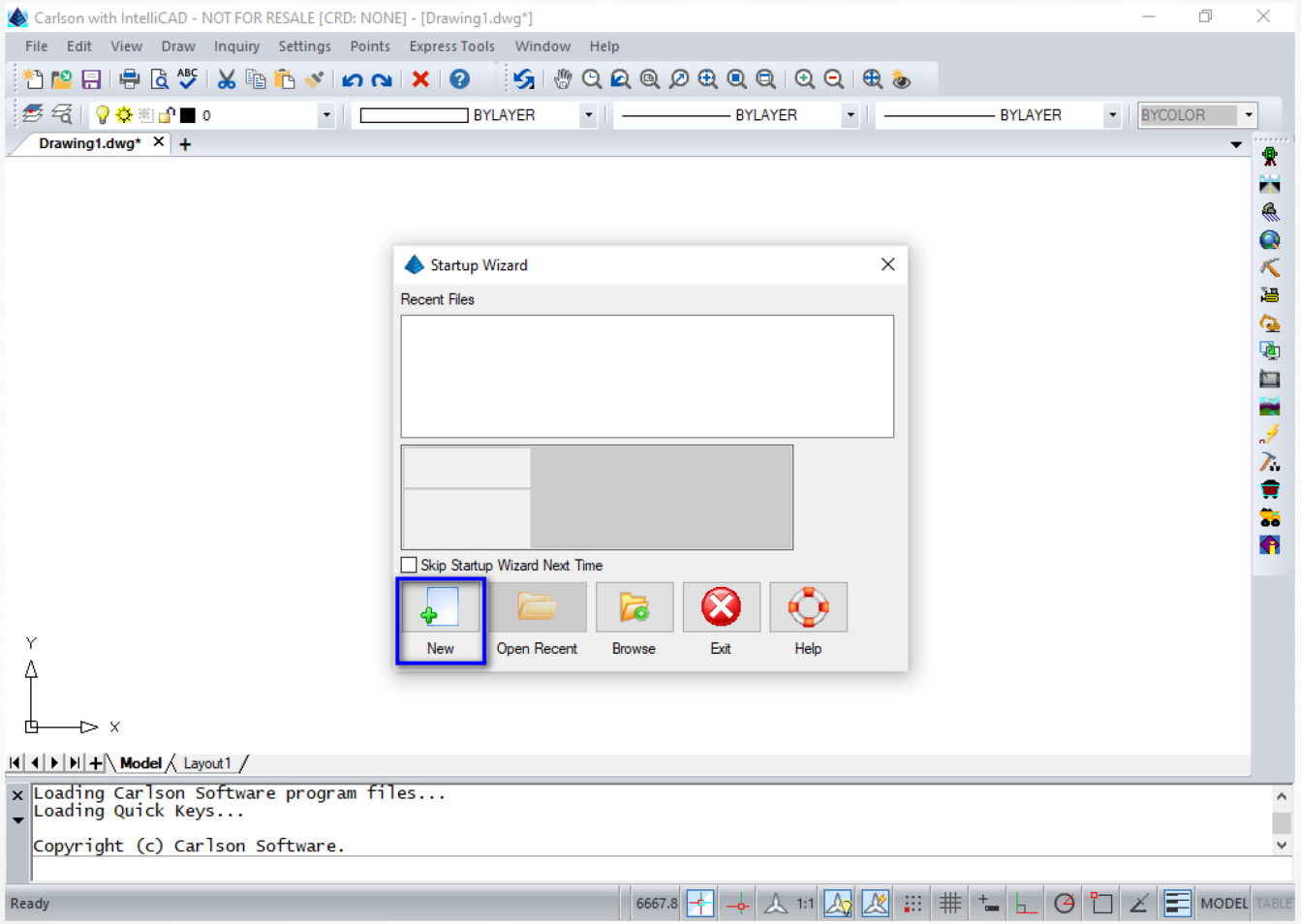
AMALGAMATION

- Desire WisCRS – Dane County
- Draw F2F
- Make Existing Surface Model
- Export/Validate to Google Earth
- (optional) Integrate with Source LIDAR at ftp://ftp.ssec.wisc.edu/pub/wisconsinview/lidar/Dane/Dane_2010_County_Delivery/Classified_LAS/LAS/

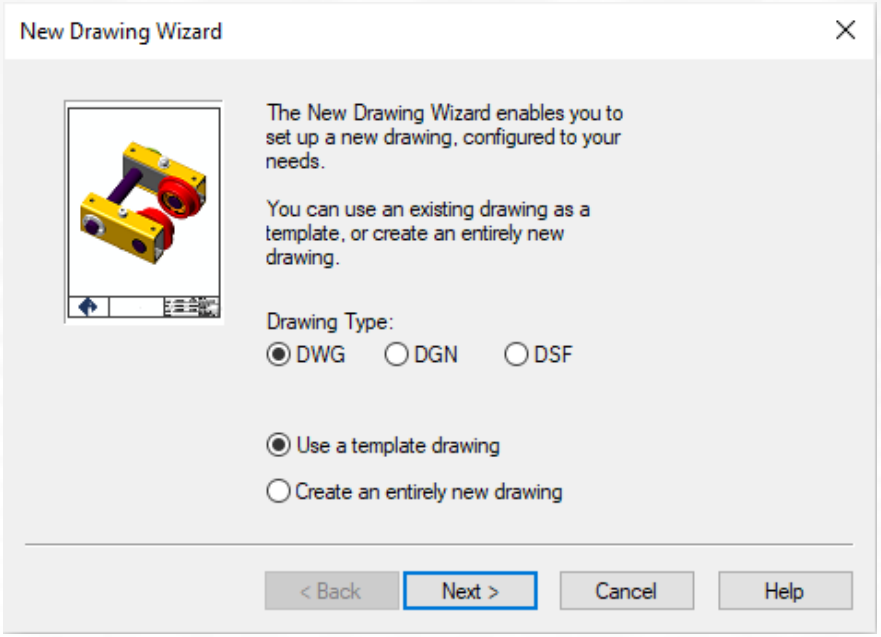
lc2t80702f.las	lc2t80701f.las
lc2t80711f.las	lc2t80712f.las

AMALGAMATION

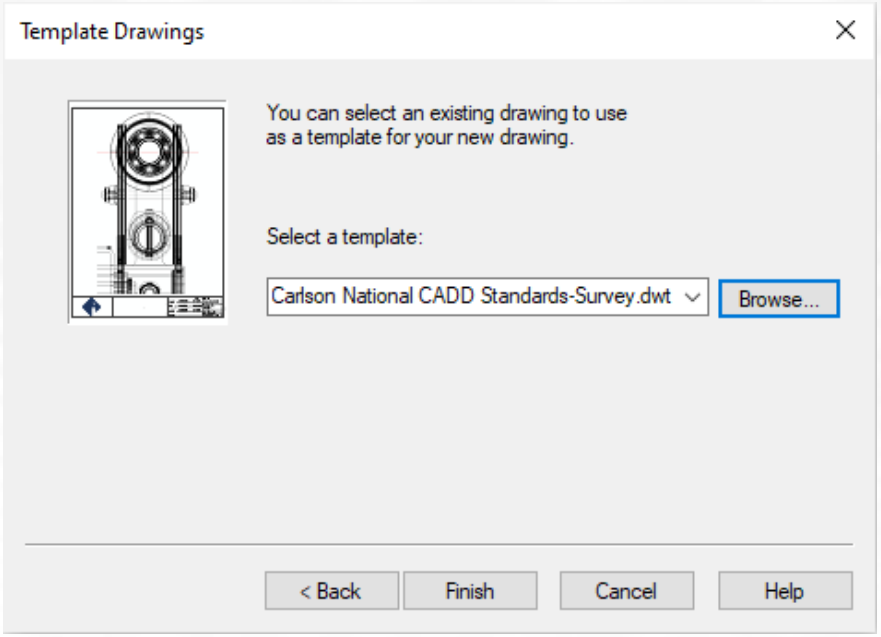
AMALGAMATION



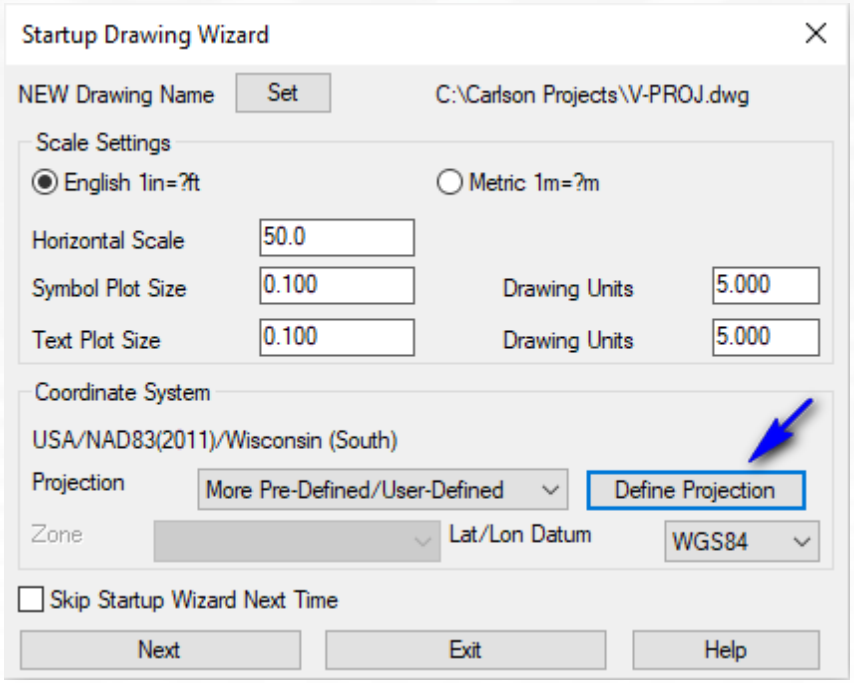
AMALGAMATION



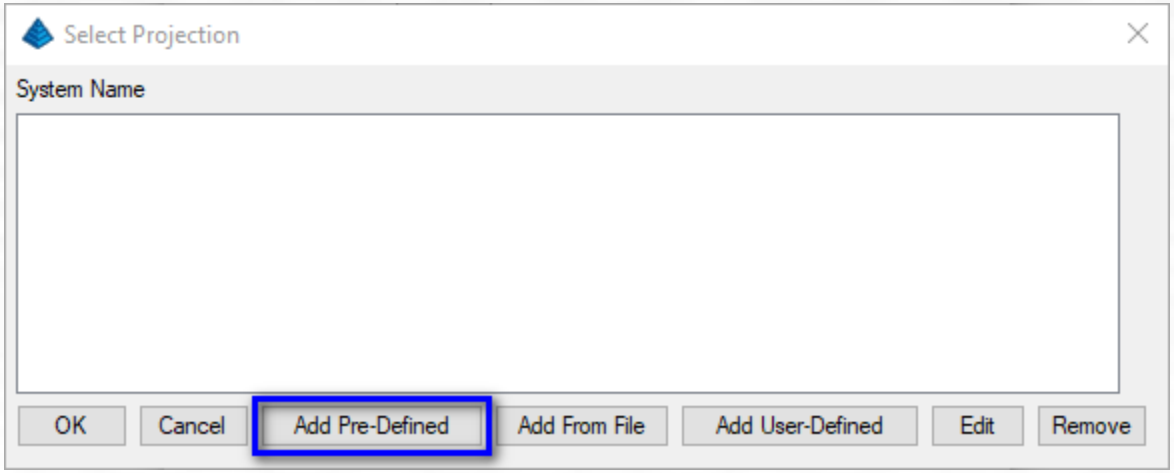
AMALGAMATION



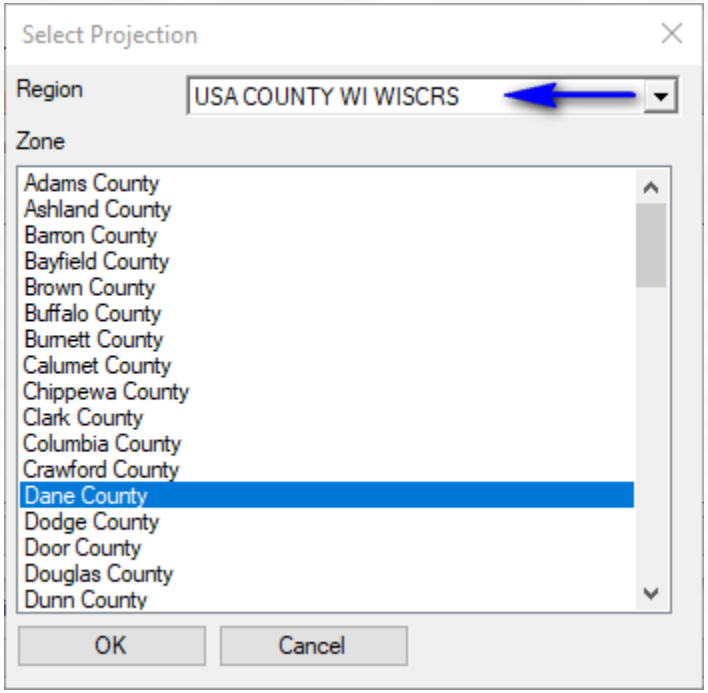
AMALGAMATION



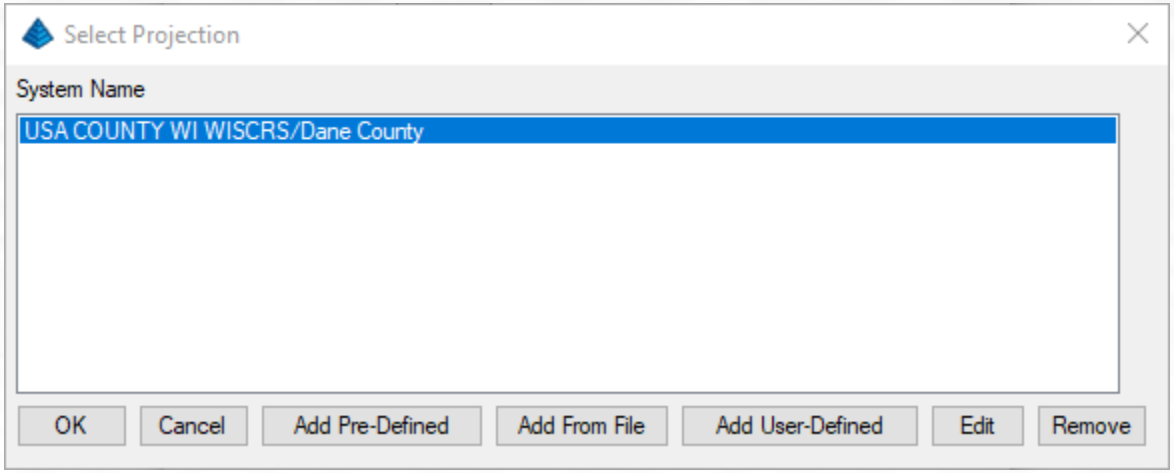
AMALGAMATION



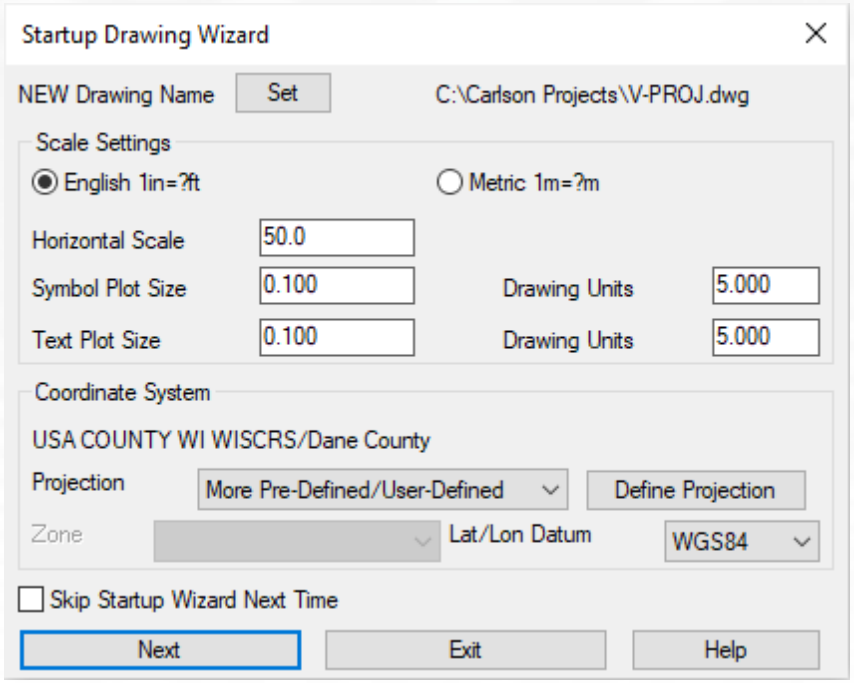
AMALGAMATION



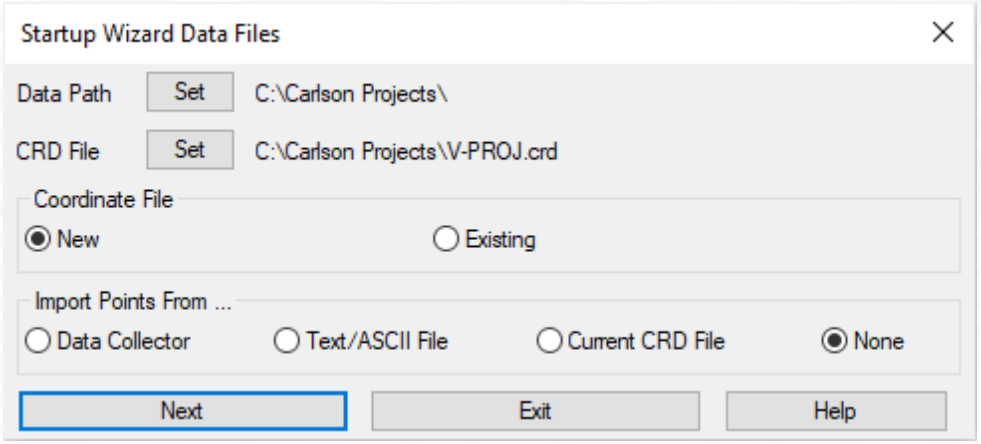
AMALGAMATION



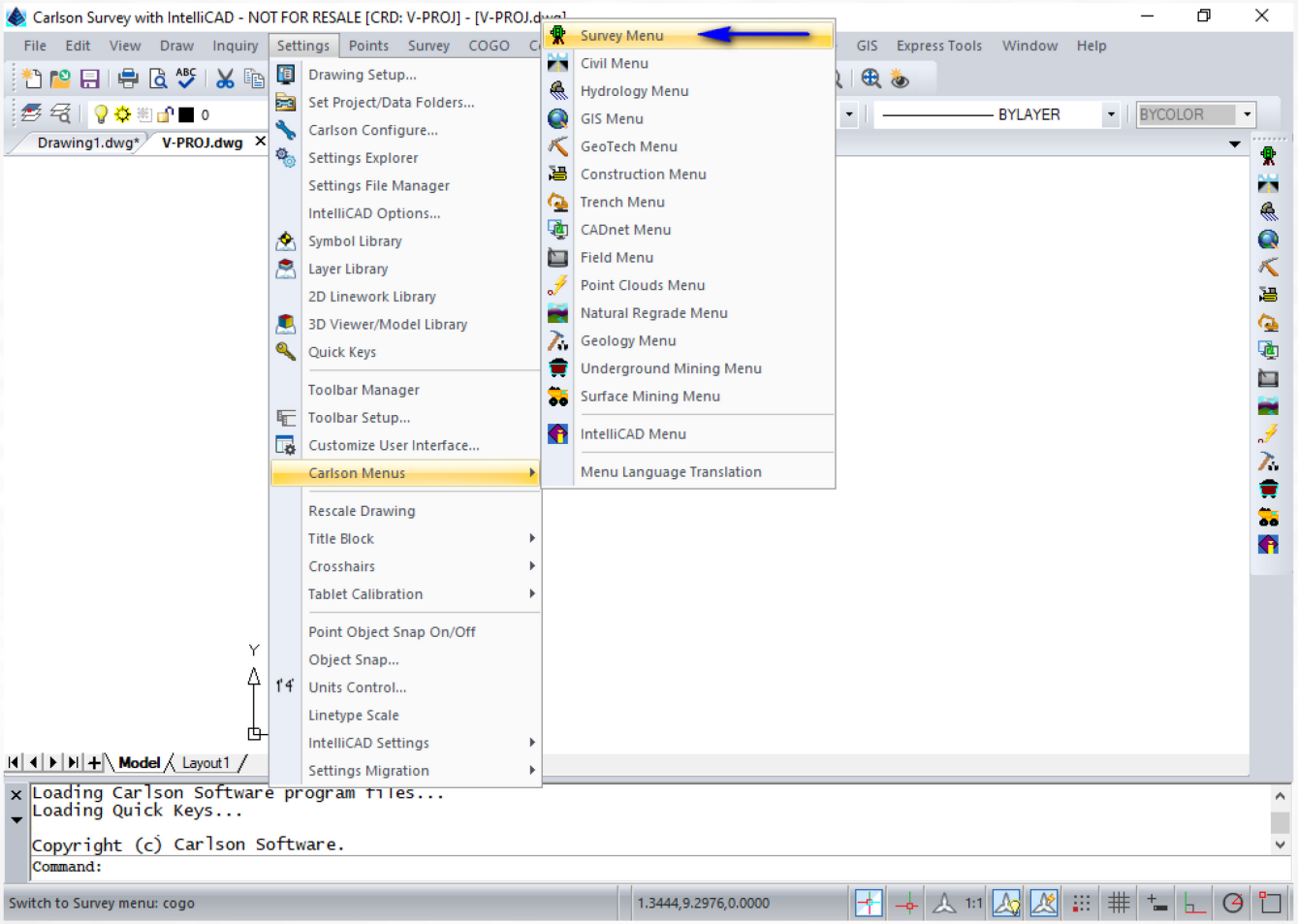
AMALGAMATION



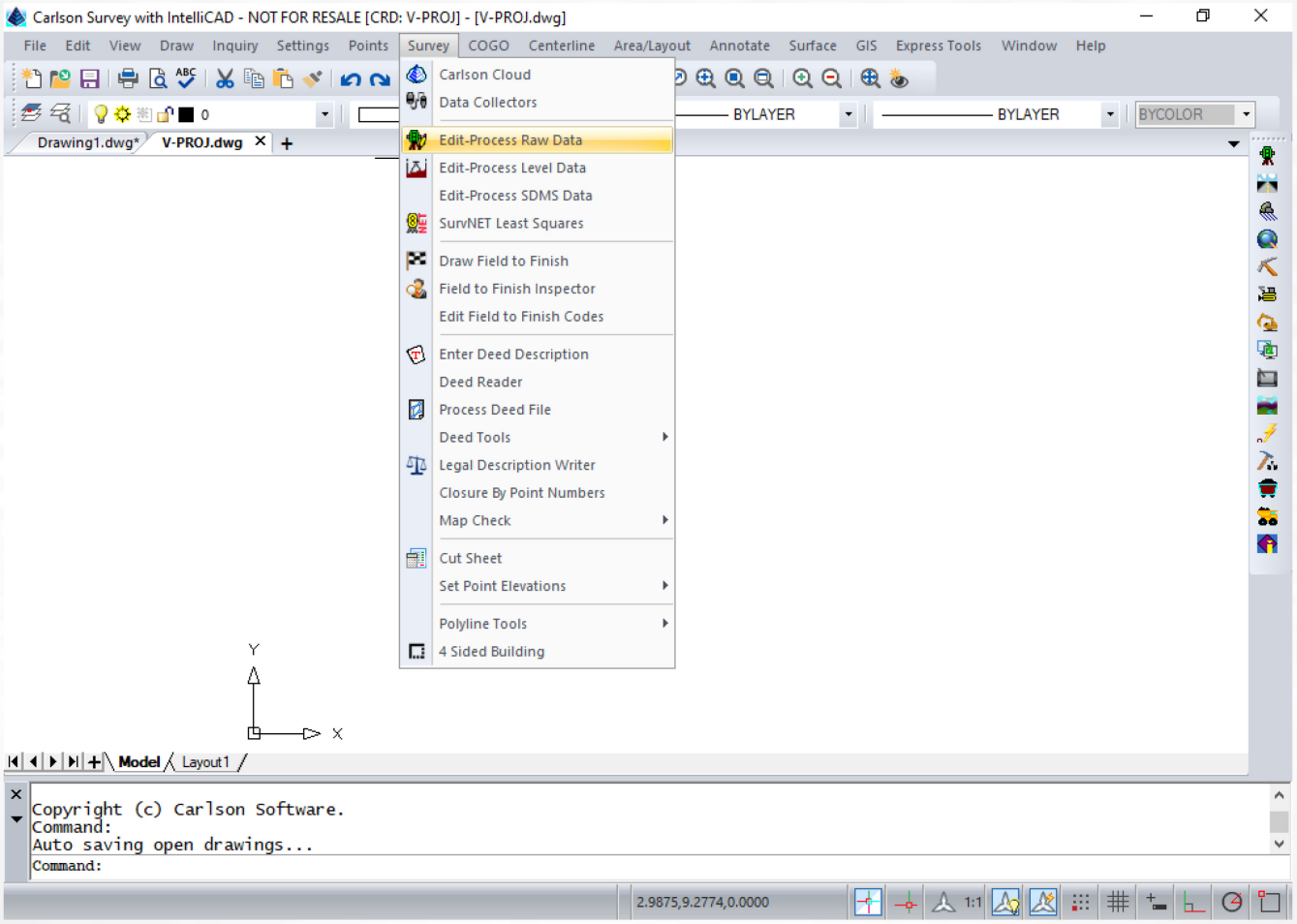
AMALGAMATION



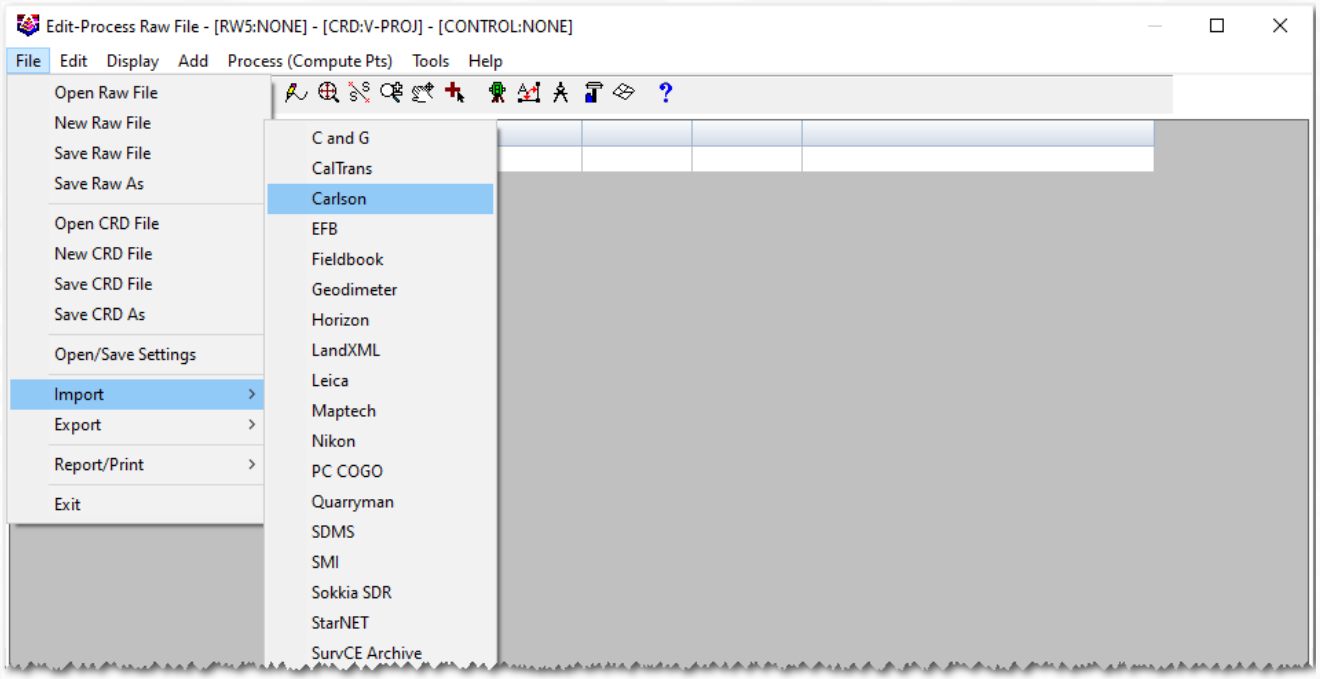
AMALGAMATION



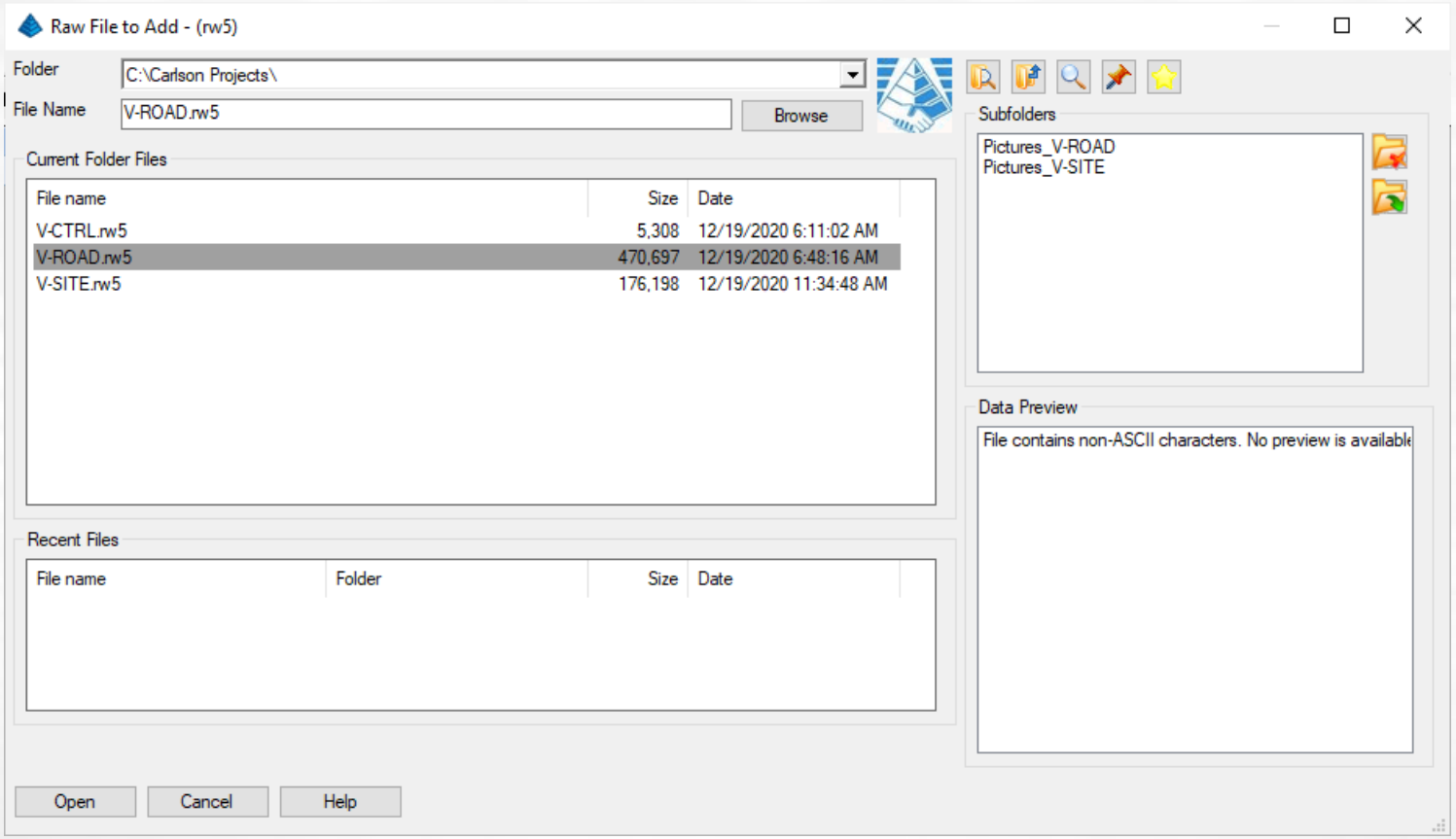
AMALGAMATION



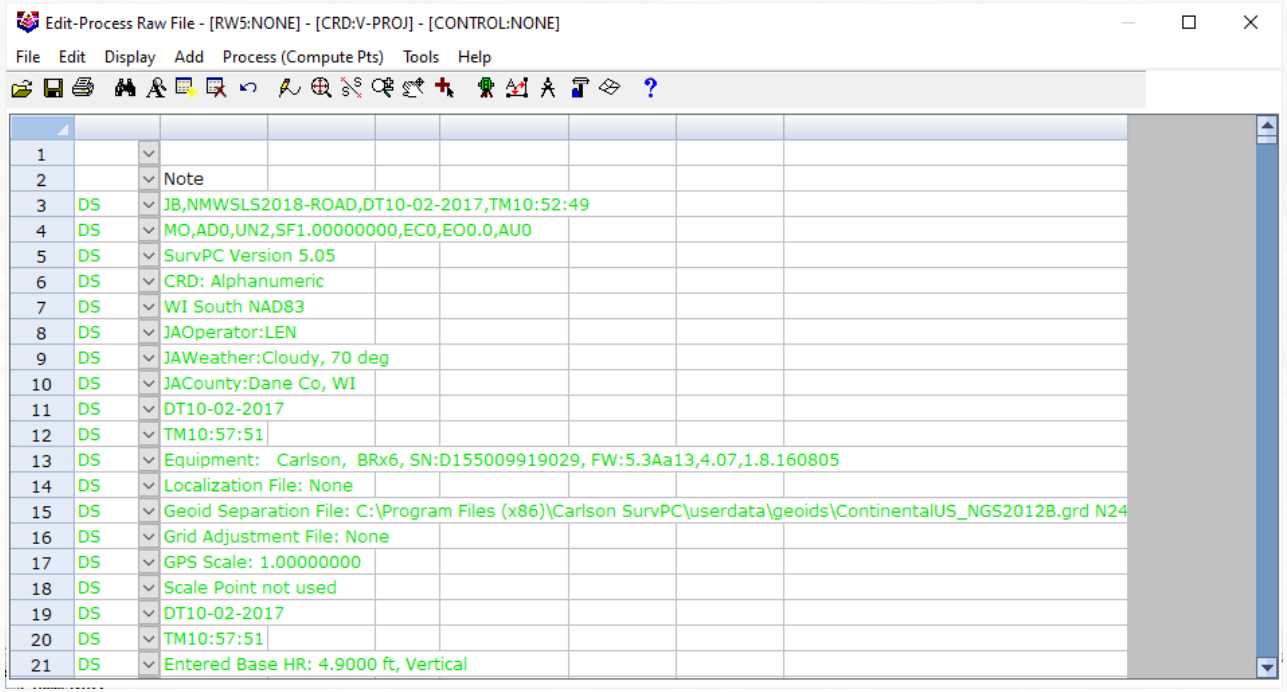
AMALGAMATION



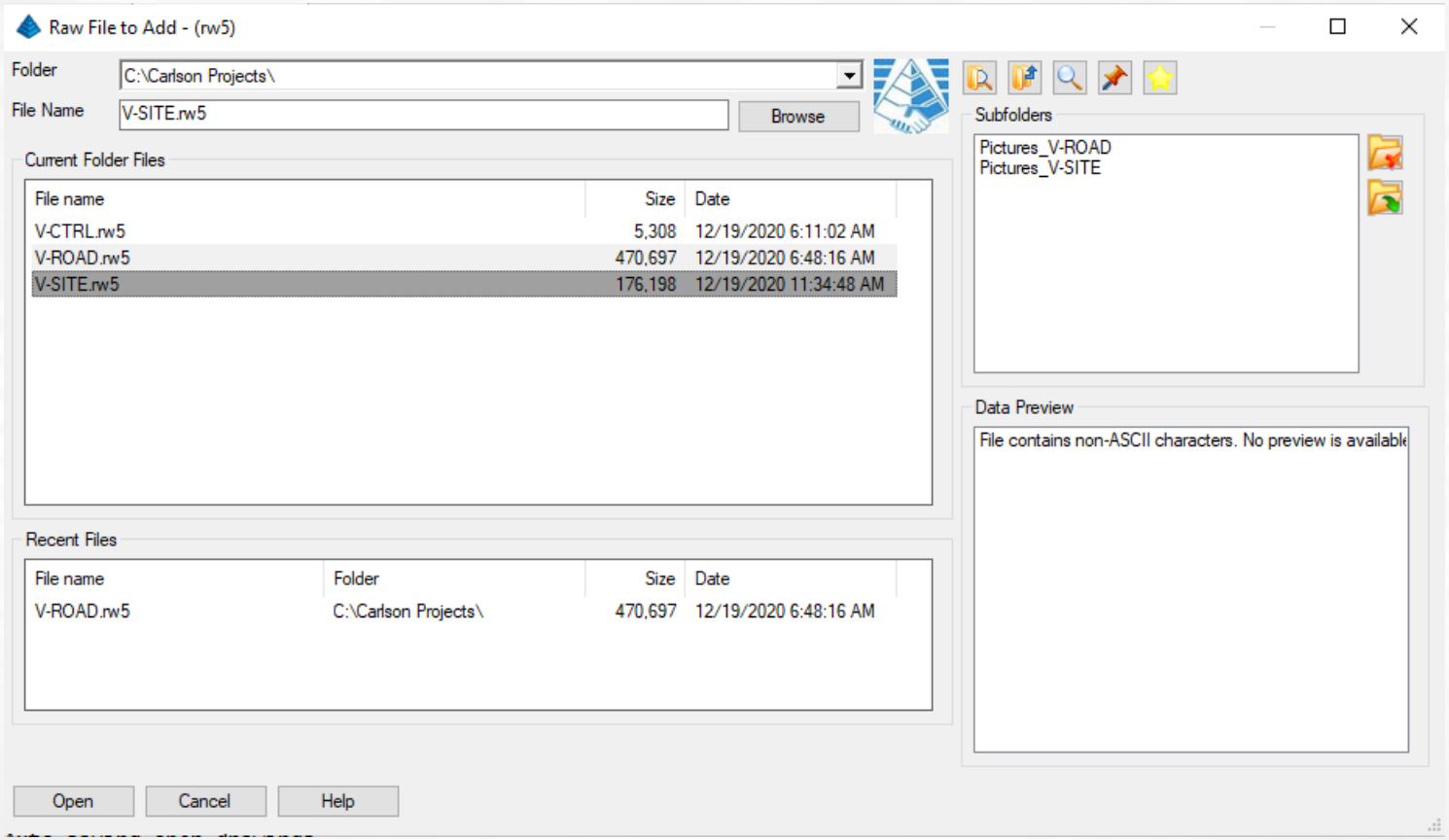
AMALGAMATION



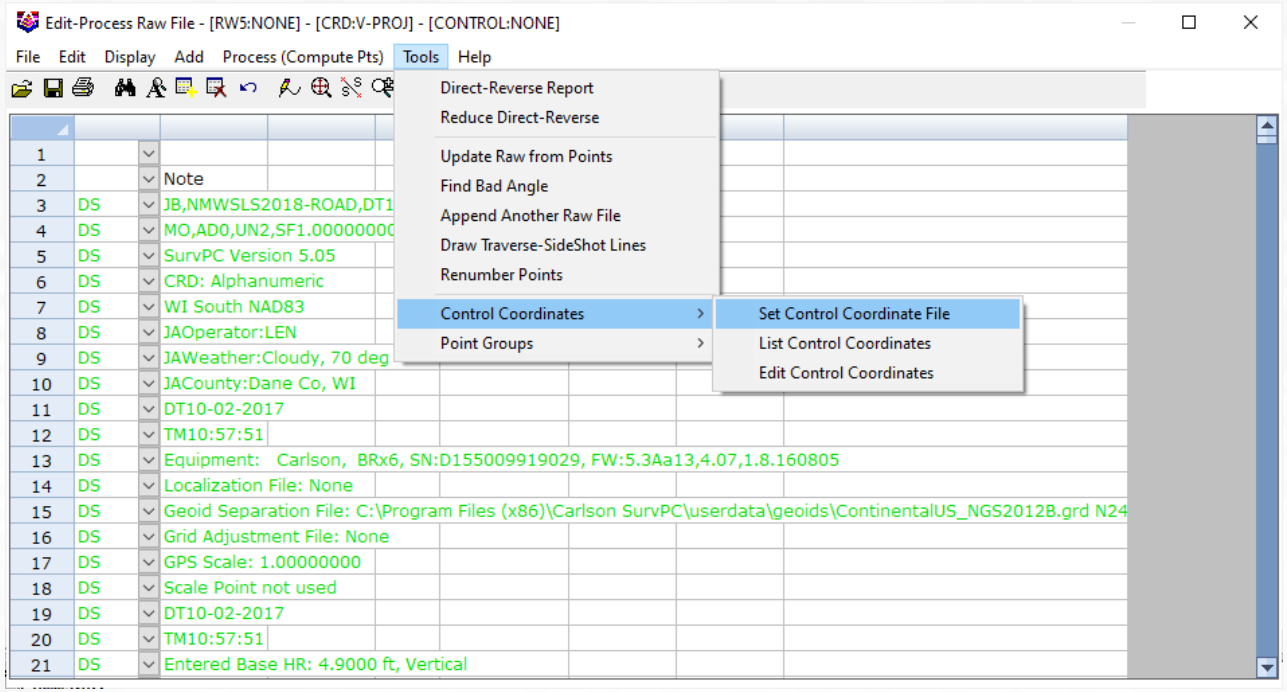
AMALGAMATION



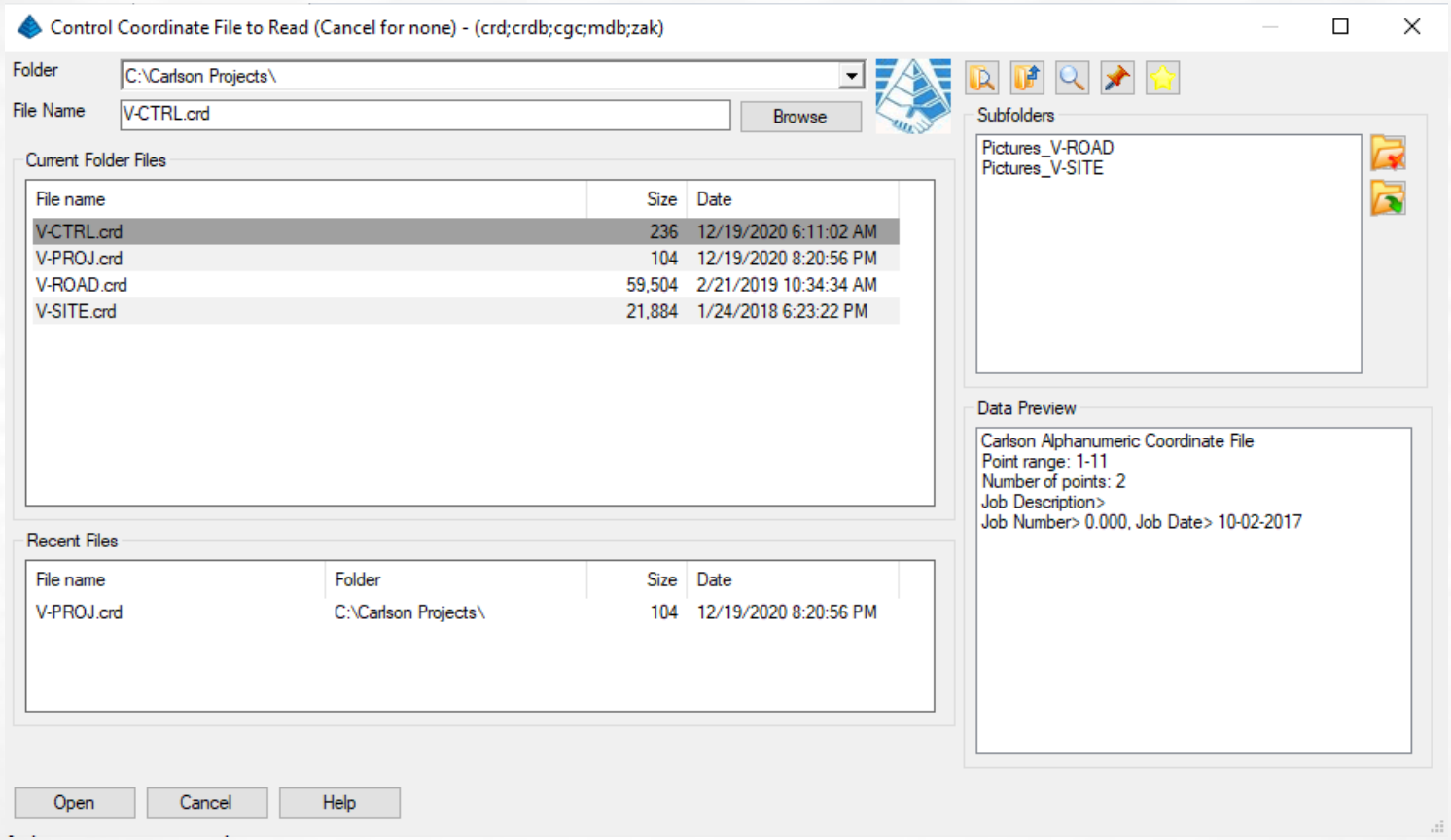
AMALGAMATION



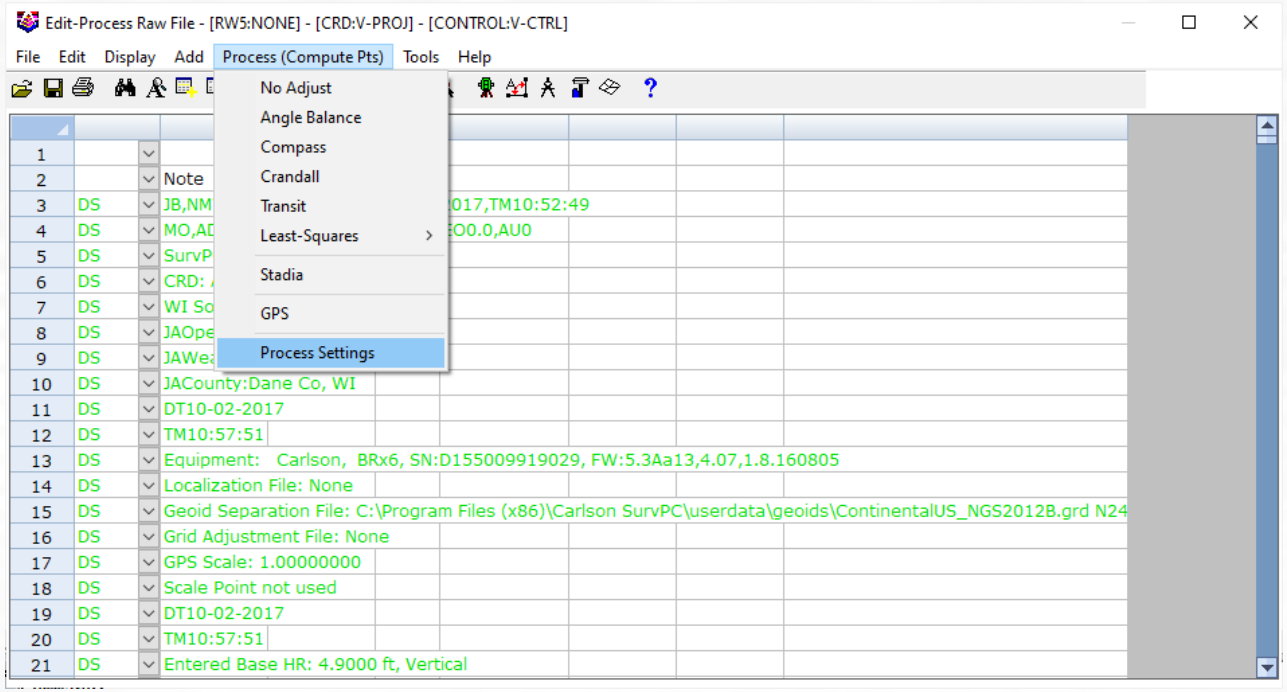
AMALGAMATION



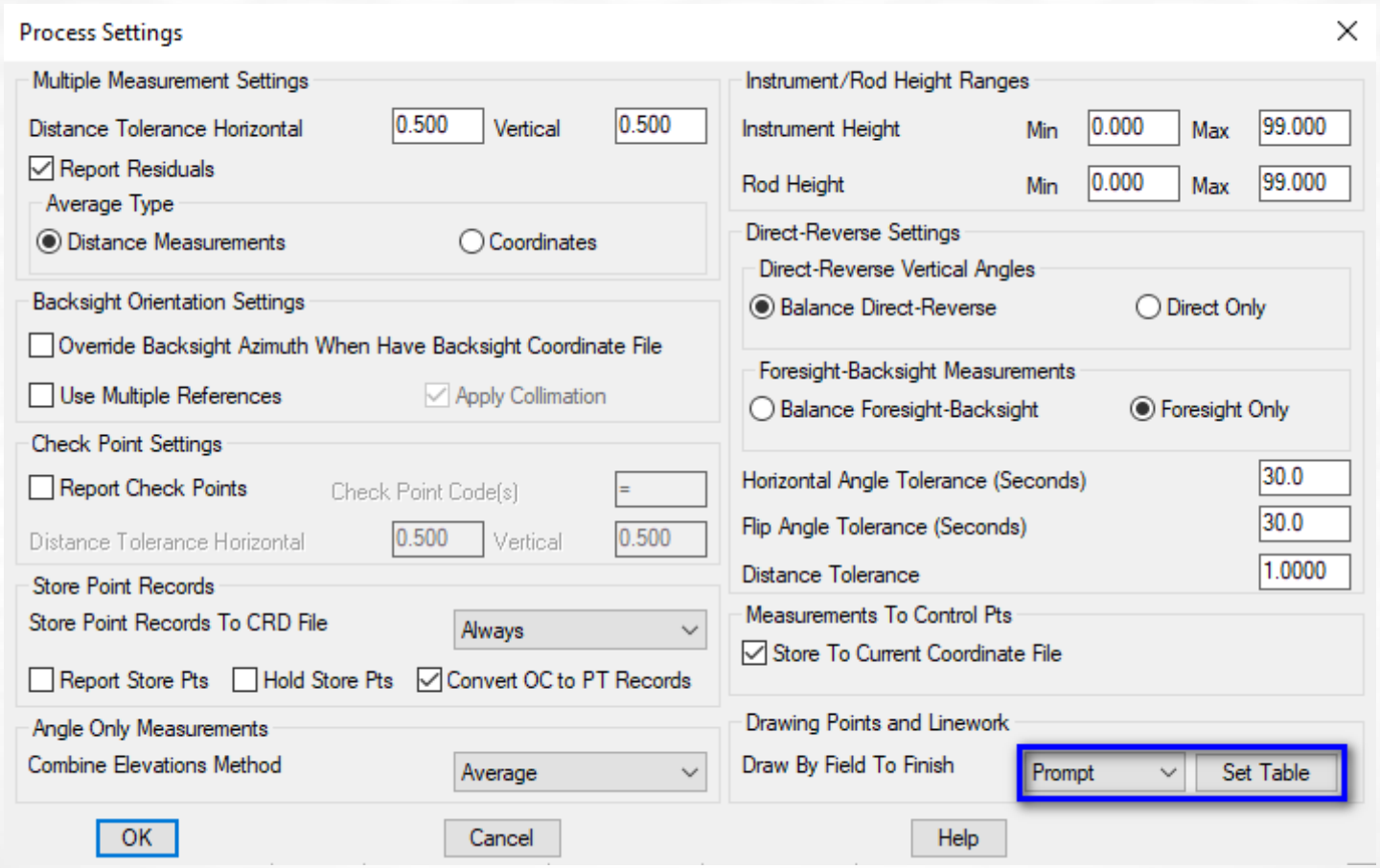
AMALGAMATION



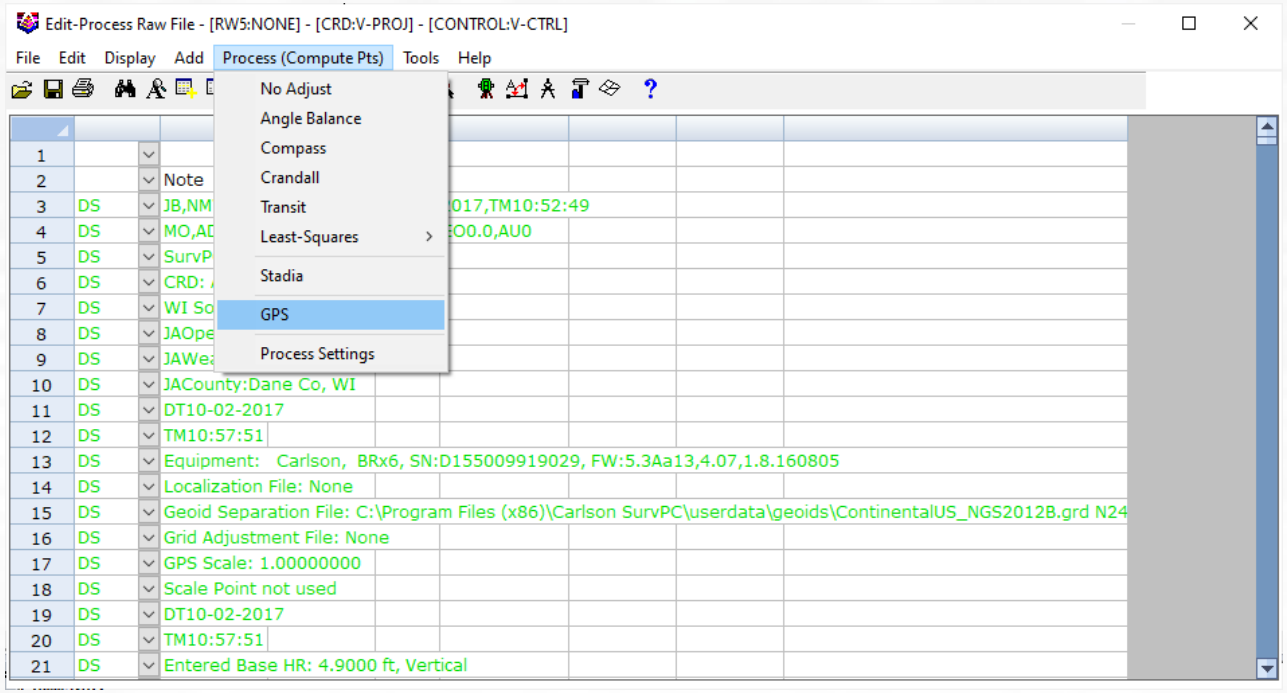
AMALGAMATION



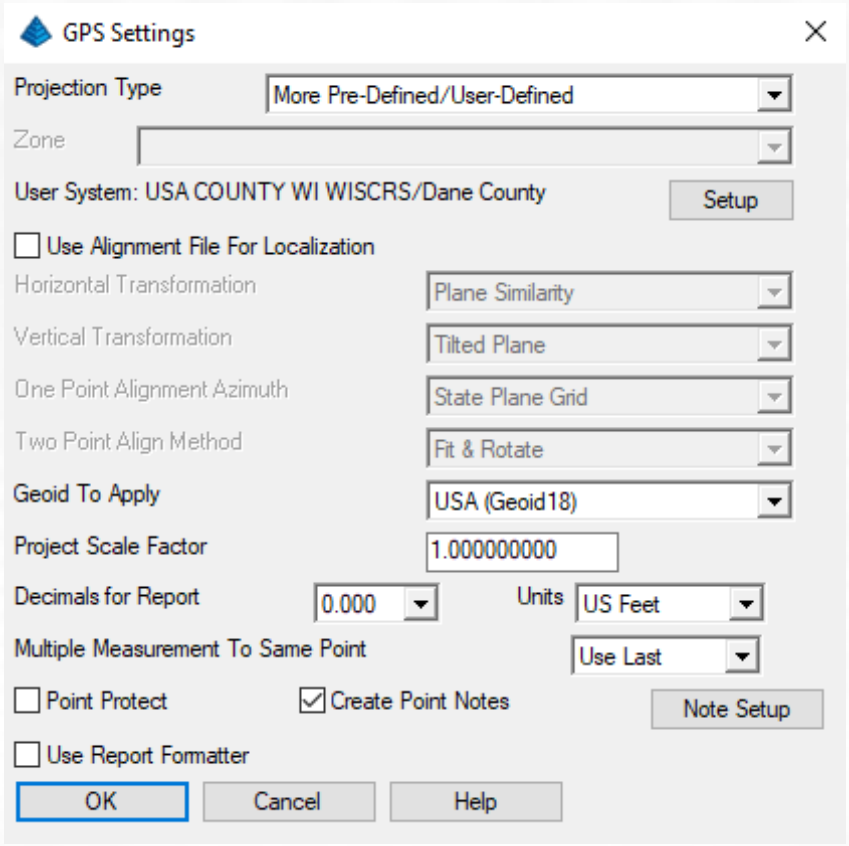
AMALGAMATION



AMALGAMATION



AMALGAMATION

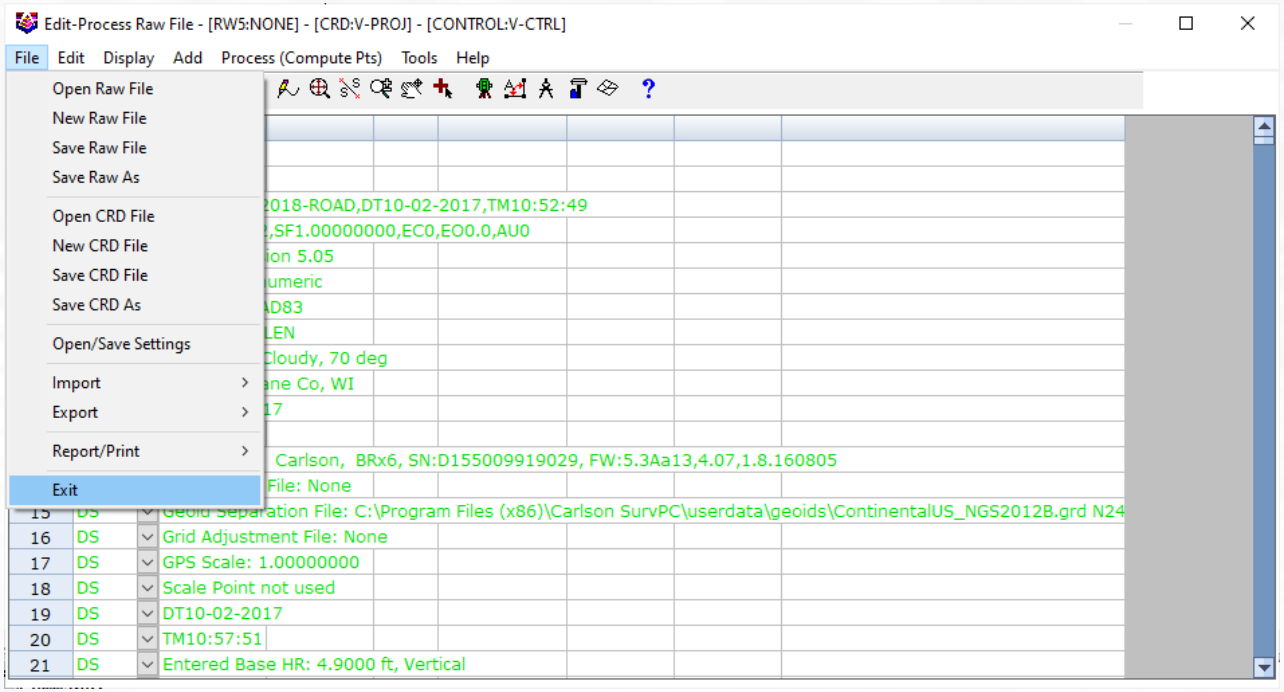


AMALGAMATION

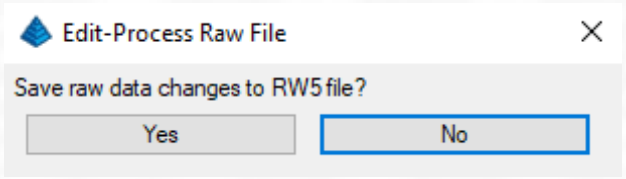
Carlson

```
Process GPS Results

Raw File:
Coordinate File: C:\Carlson Projects\V-PROJ.crd
Projection: USA COUNTY WI WISCRS/Dane County
Geoid: GEOID 2018
Alignment File: NONE

Point      Latitude          Longitude         GPS Z(m)  Rod Height Geoid
No.        Northing          Easting           Elevation Description

1         43°11'23.24502"   -89°37'18.21173"  253.364   5.333       -113.038
1         524847.029        757790.873        938.951   GPS /Ron Ripp GPS
GS,PN1,N 433869.9436,E 2069378.3872,EL938.9055,--GPS /Ron Ripp GPS
Base Configuration by Entering Latitude and Longitude
DT10-02-2017
TM10:58:18
Entered Base HR: 4.9000 ft, Vertical
Antenna Type: [HEMS321          NONE],RA0.0730m,SHMP0.1050m,L10.1319m,L20.1389m,--Integrated GNSS an
GS,PN0,N 433869.9436,E 2069378.3872,EL938.9055,--Base
GT,PN0,SW1969,ST143807000,EW1969,ET143807000
Antenna Type: [HEMS321          NONE],RA0.0730m,SHMP0.1050m,L10.1319m,L20.1389m,--Integrated GNSS an
RTK Method: Auto, Device: Internal UHF
Entered Rover HR: 6.5617 ft, Vertical

101        43°11'44.32121"   -89°37'14.80426"  251.961   6.994       -113.080
101        526980.411        758048.367        932.728   EA0
GS,PN101,N 436004.8388,E 2069621.1000,EL932.6797,--EA0
GT,PN101,SW1969,ST145146400,EW1969,ET145146400
HRMS:0.013, VRMS:0.022, STATUS:FIXED+, SATS:15, AGE:1.0, PDOP:1.423, HDOP:0.709, VDOP:1.235, TDOP:0
DT10-02-2017
TM11:19:02

102        43°11'44.38584"   -89°37'14.42832"  251.992   6.994       -113.081
102        526986.889        758076.232        932.831   EA0 EA2 PC
GS,PN102,N 436011.5084,E 2069648.9164,EL932.7826,--EA0 EA2 PC
GT,PN102,SW1969,ST145213800,EW1969,ET145213800
HRMS:0.015, VRMS:0.025, STATUS:FIXED+, SATS:15, AGE:2.0, PDOP:1.424, HDOP:0.709, VDOP:1.235, TDOP:0
DT10-02-2017
```

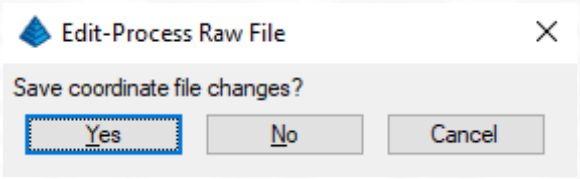
AMALGAMATION



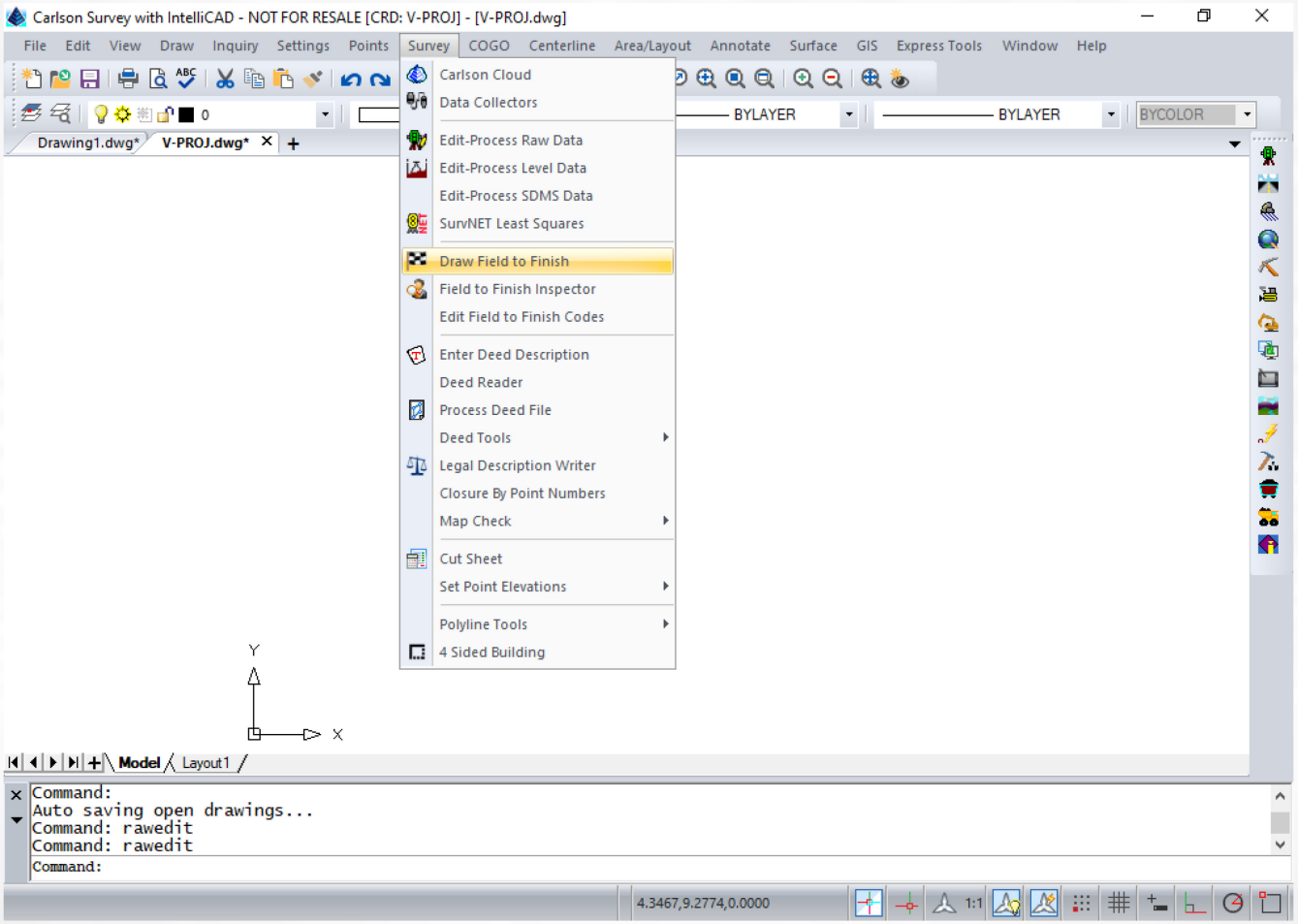
AMALGAMATION



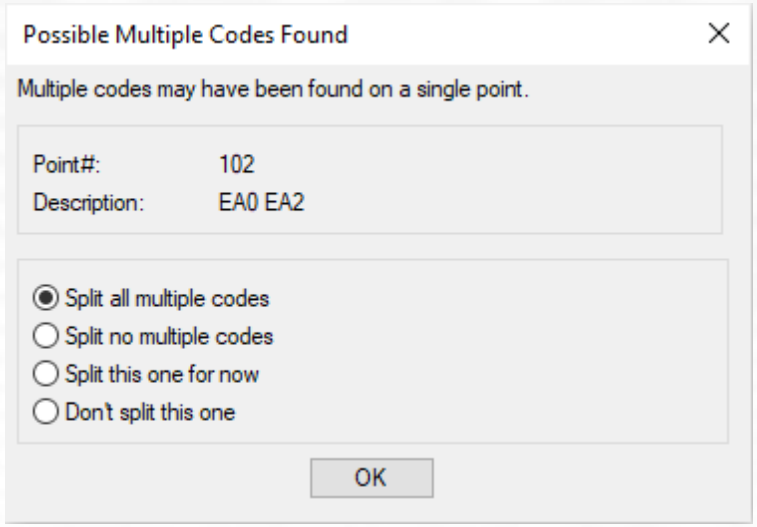
AMALGAMATION



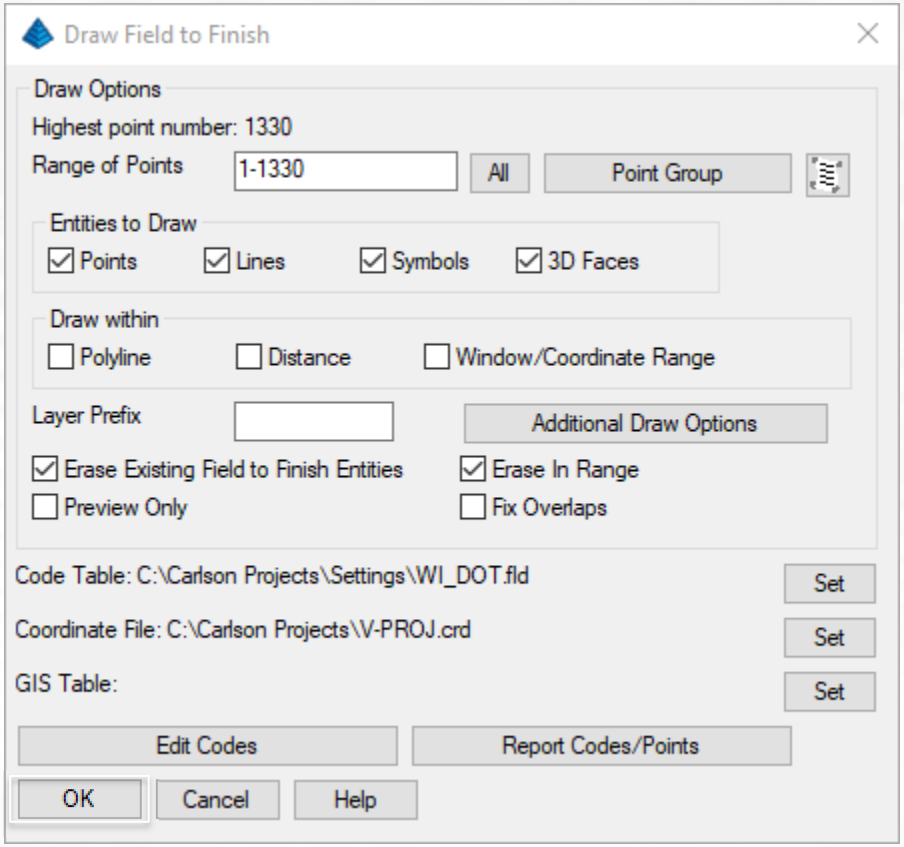
AMALGAMATION



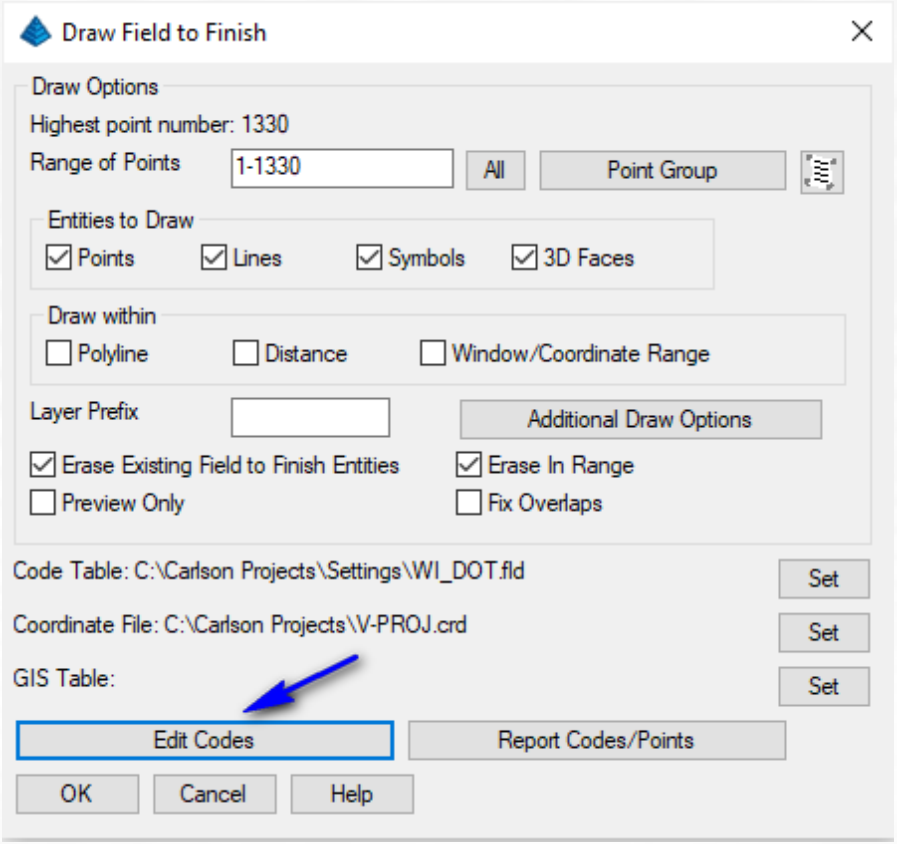
AMALGAMATION



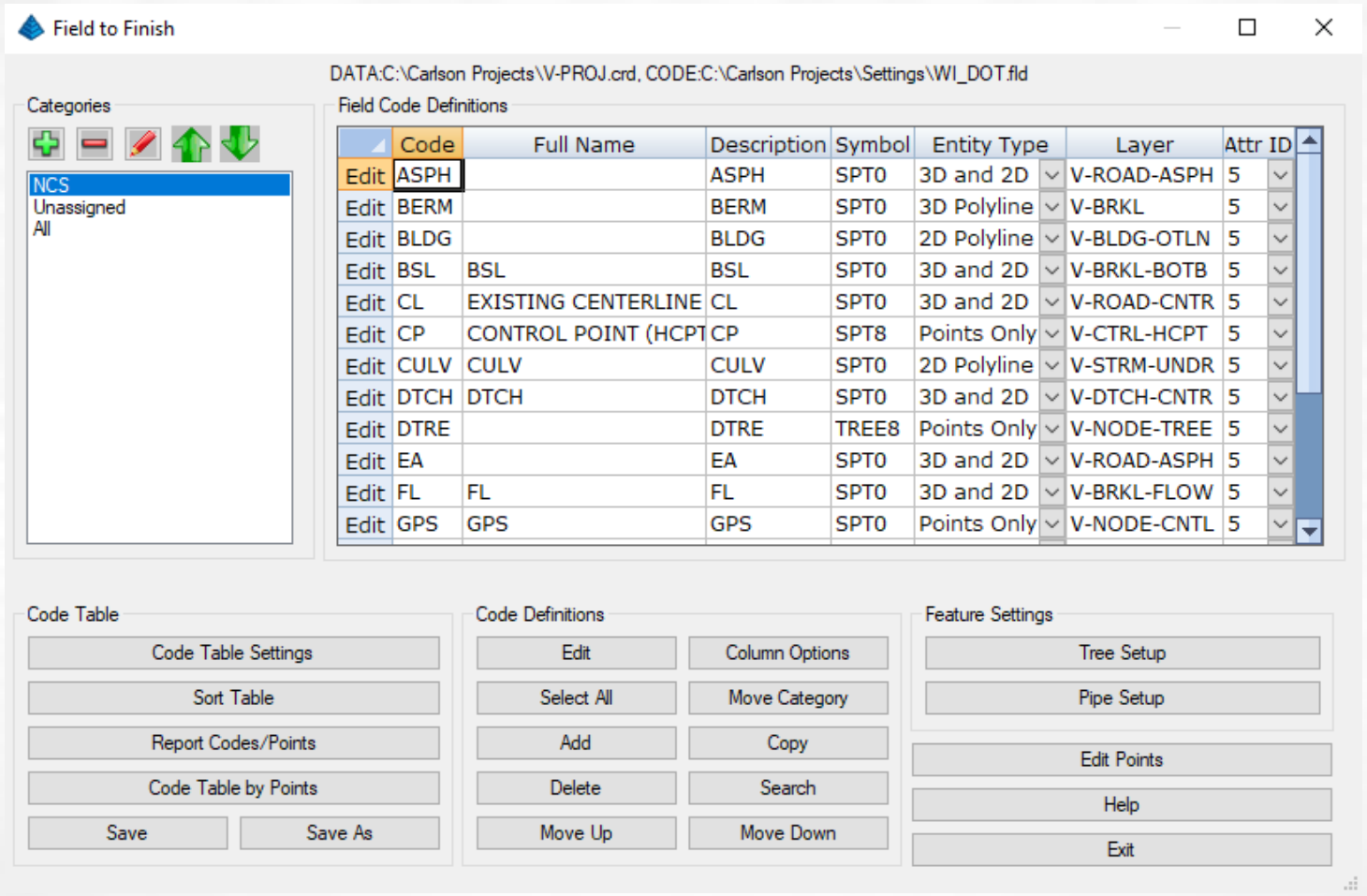
AMALGAMATION



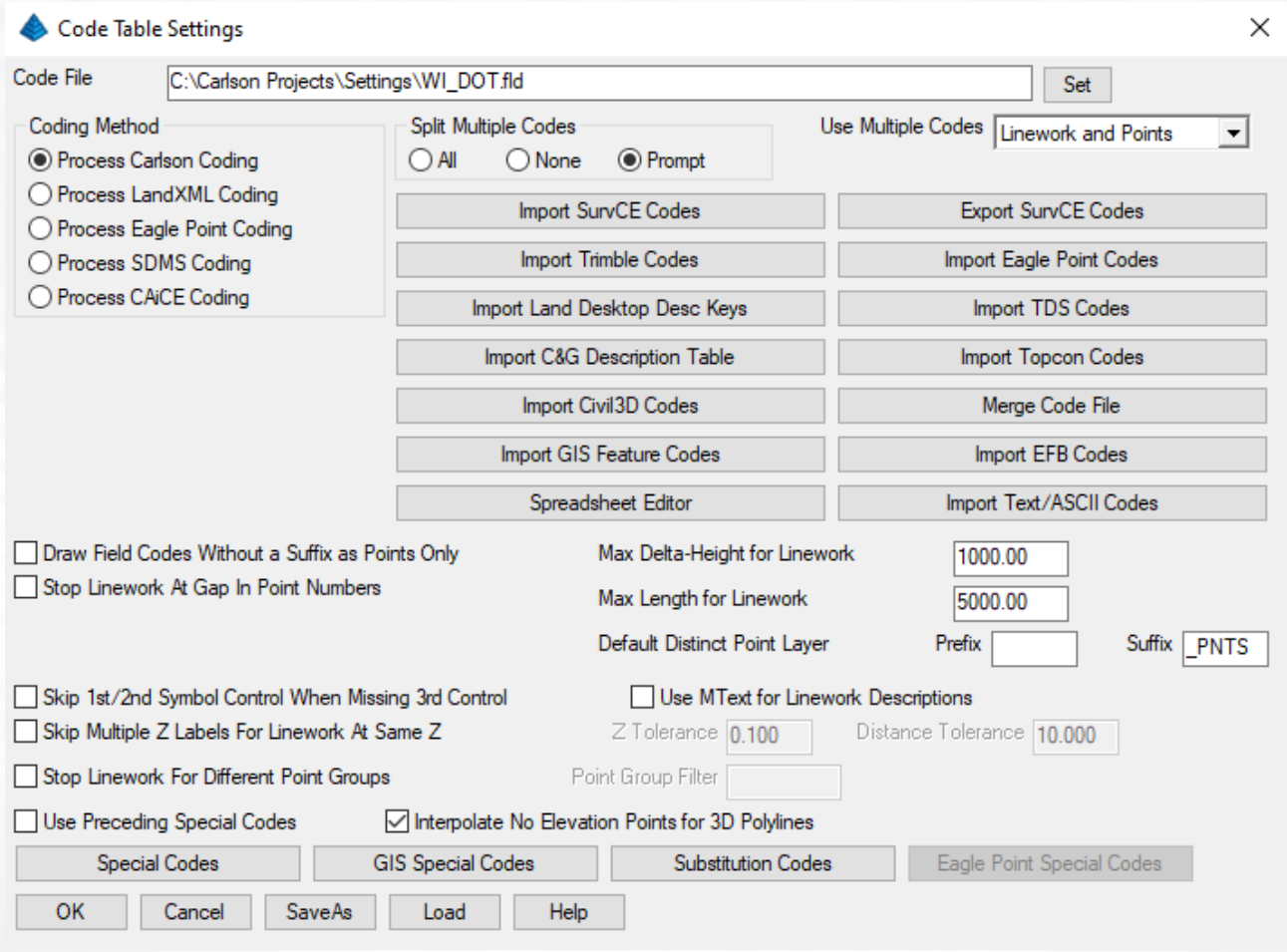
AMALGAMATION



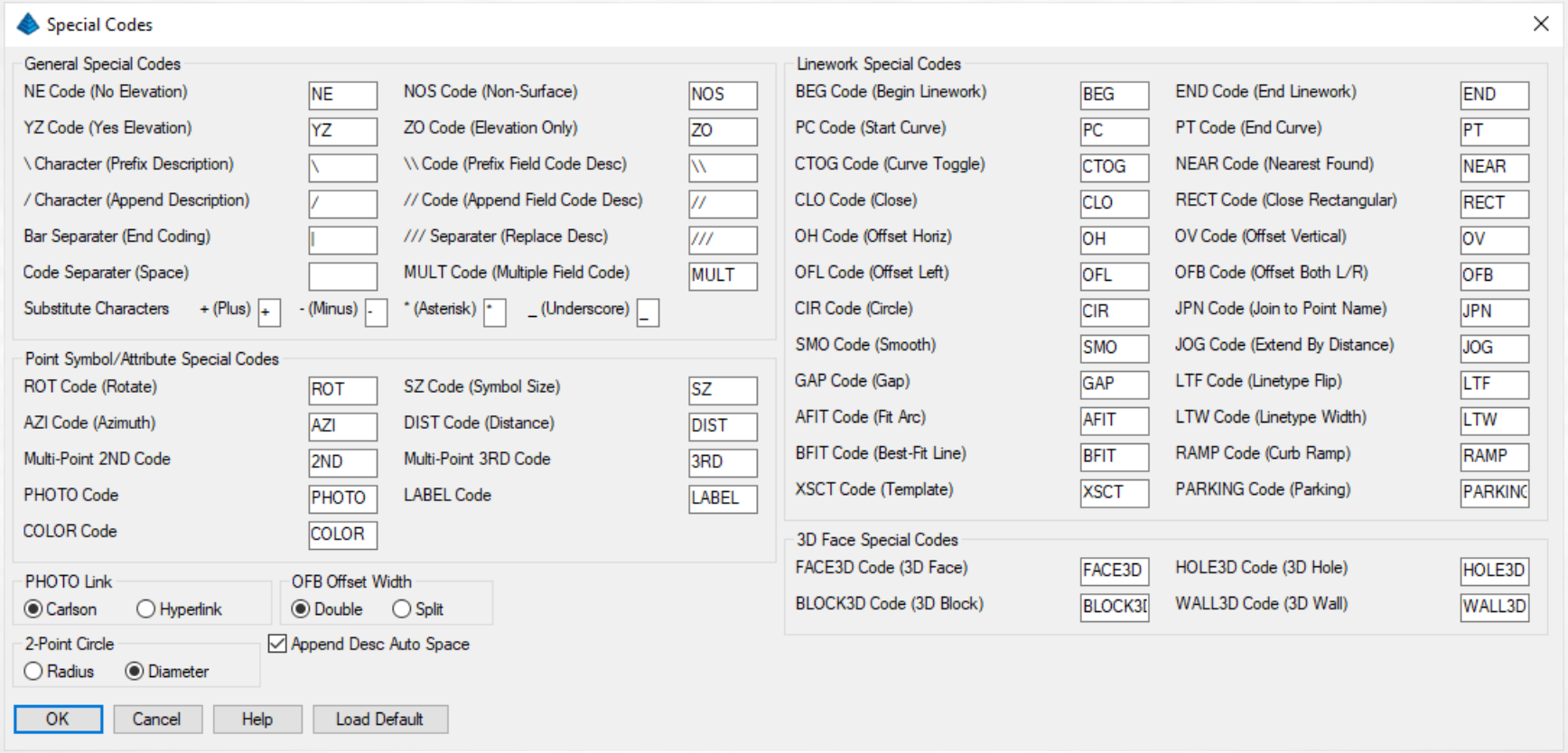
AMALGAMATION



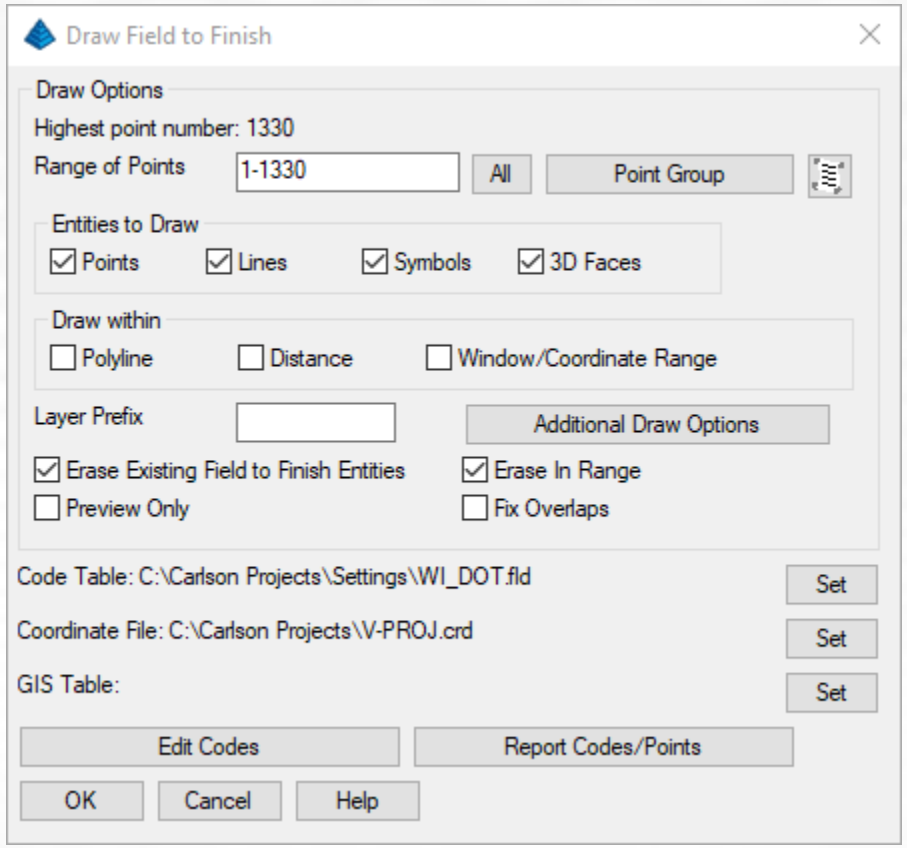
AMALGAMATION



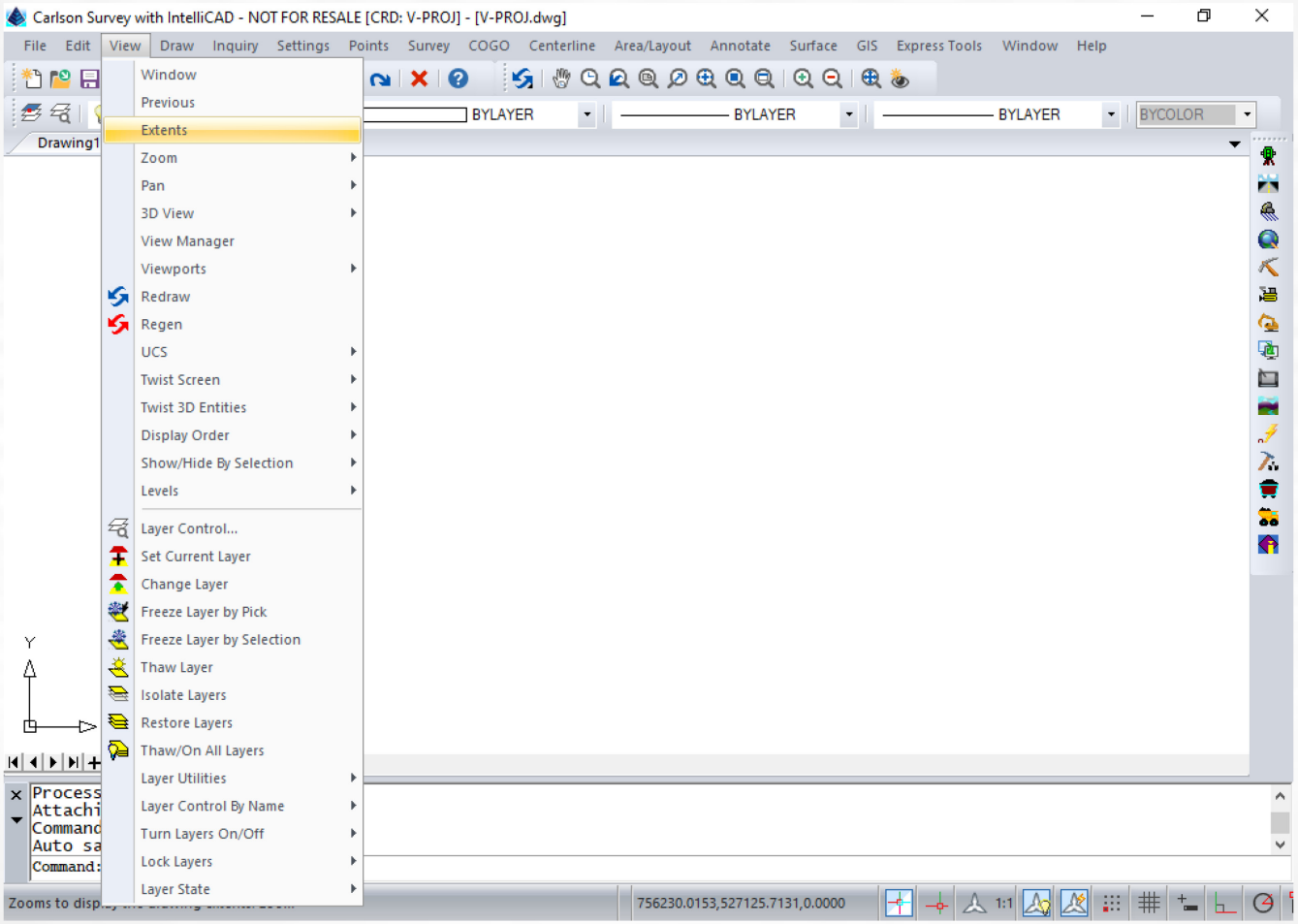
AMALGAMATION



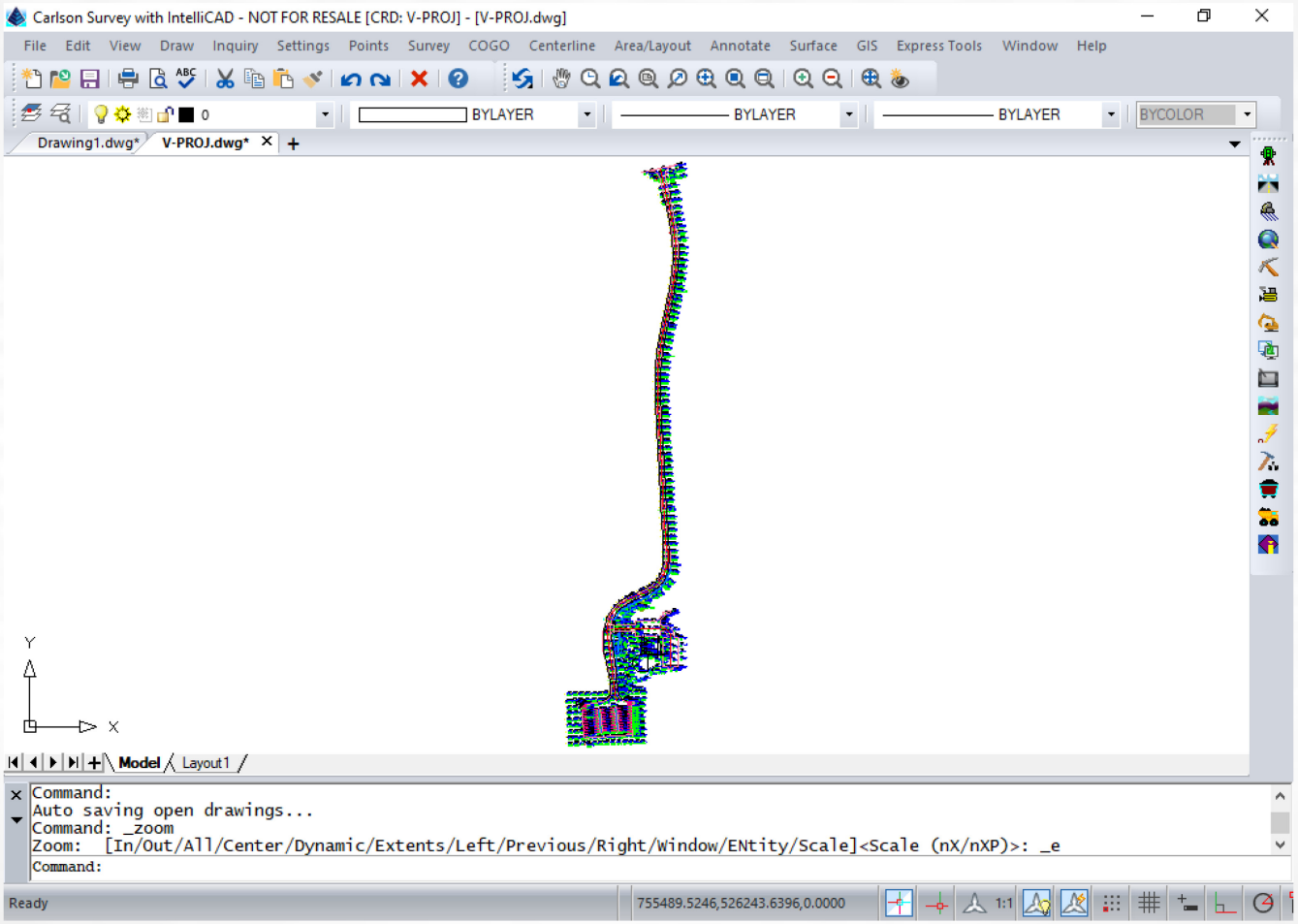
AMALGAMATION



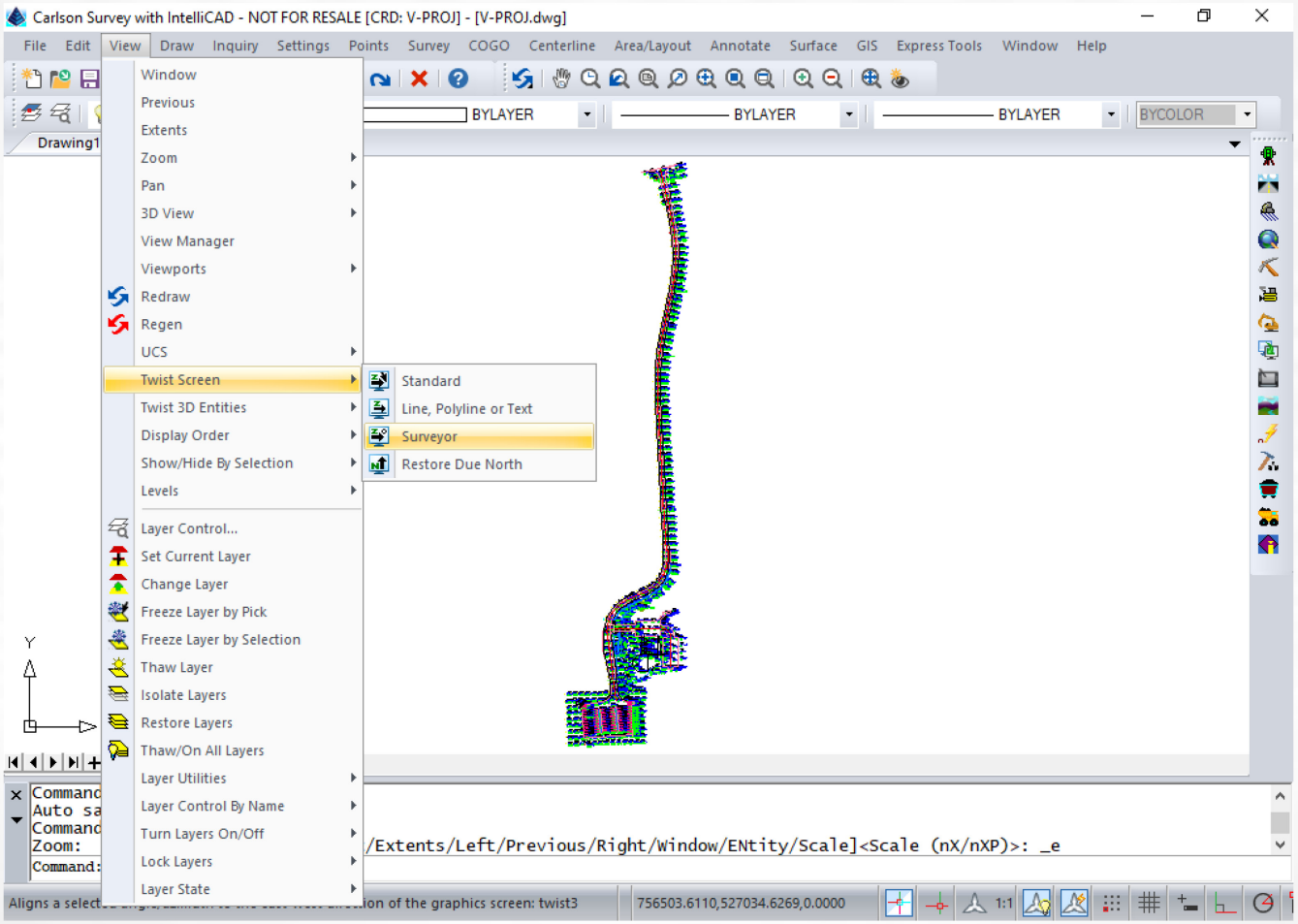
AMALGAMATION



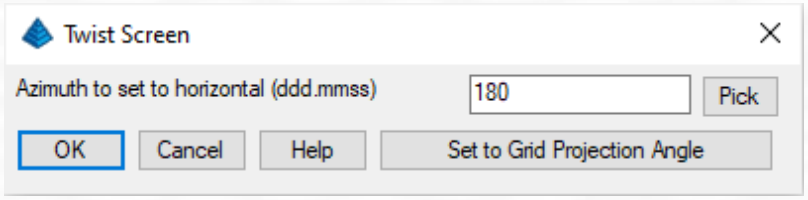
AMALGAMATION



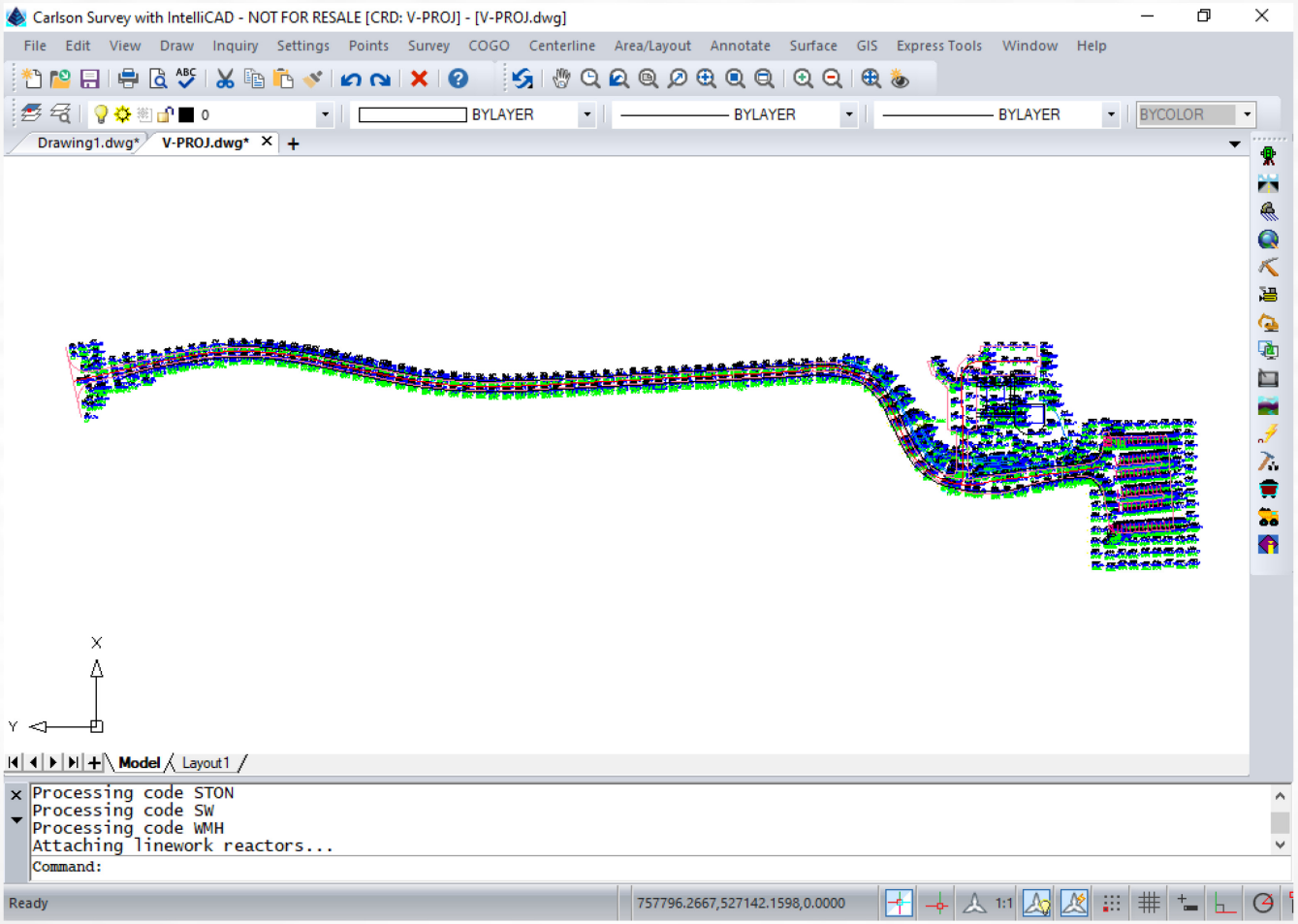
AMALGAMATION



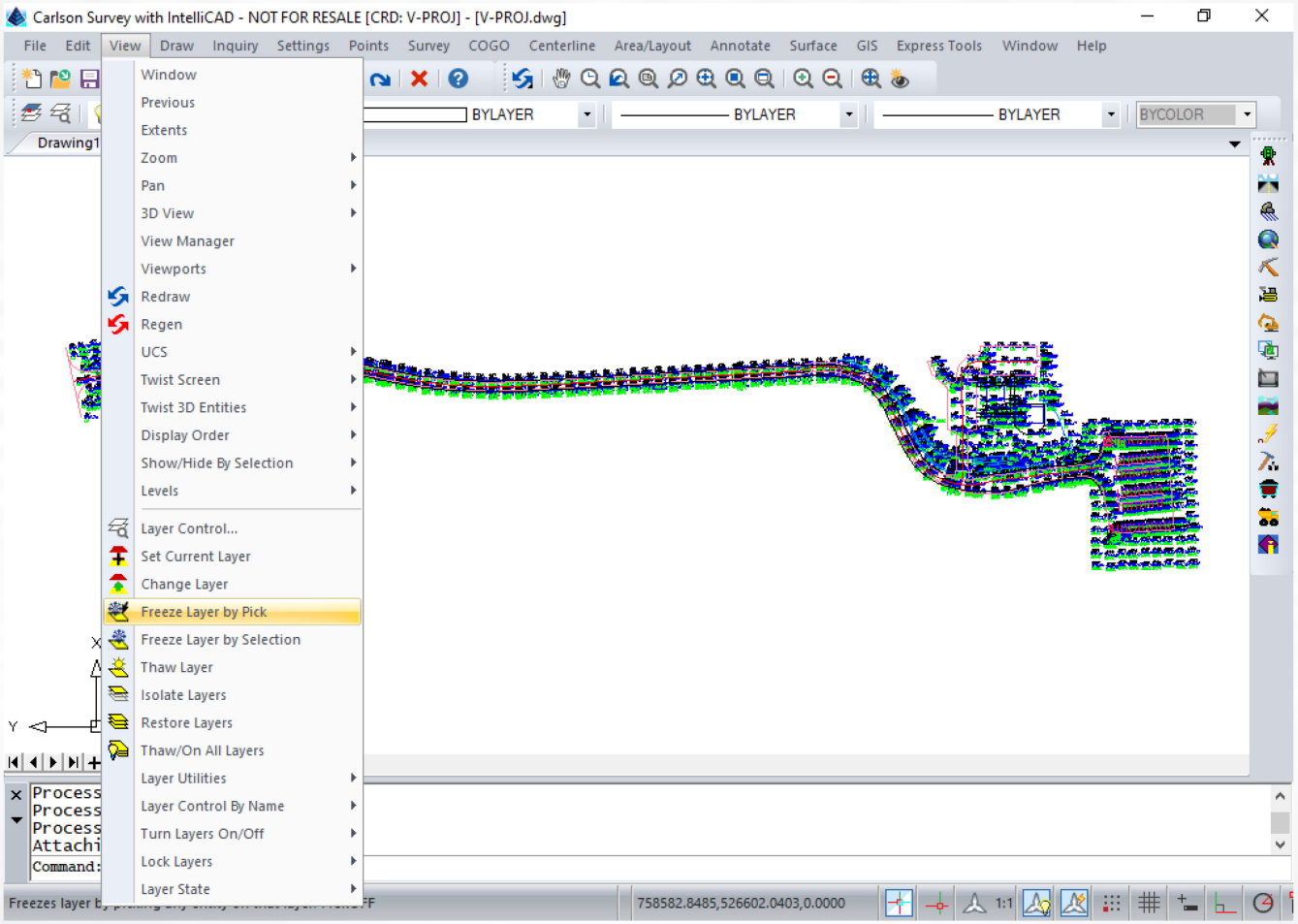
AMALGAMATION



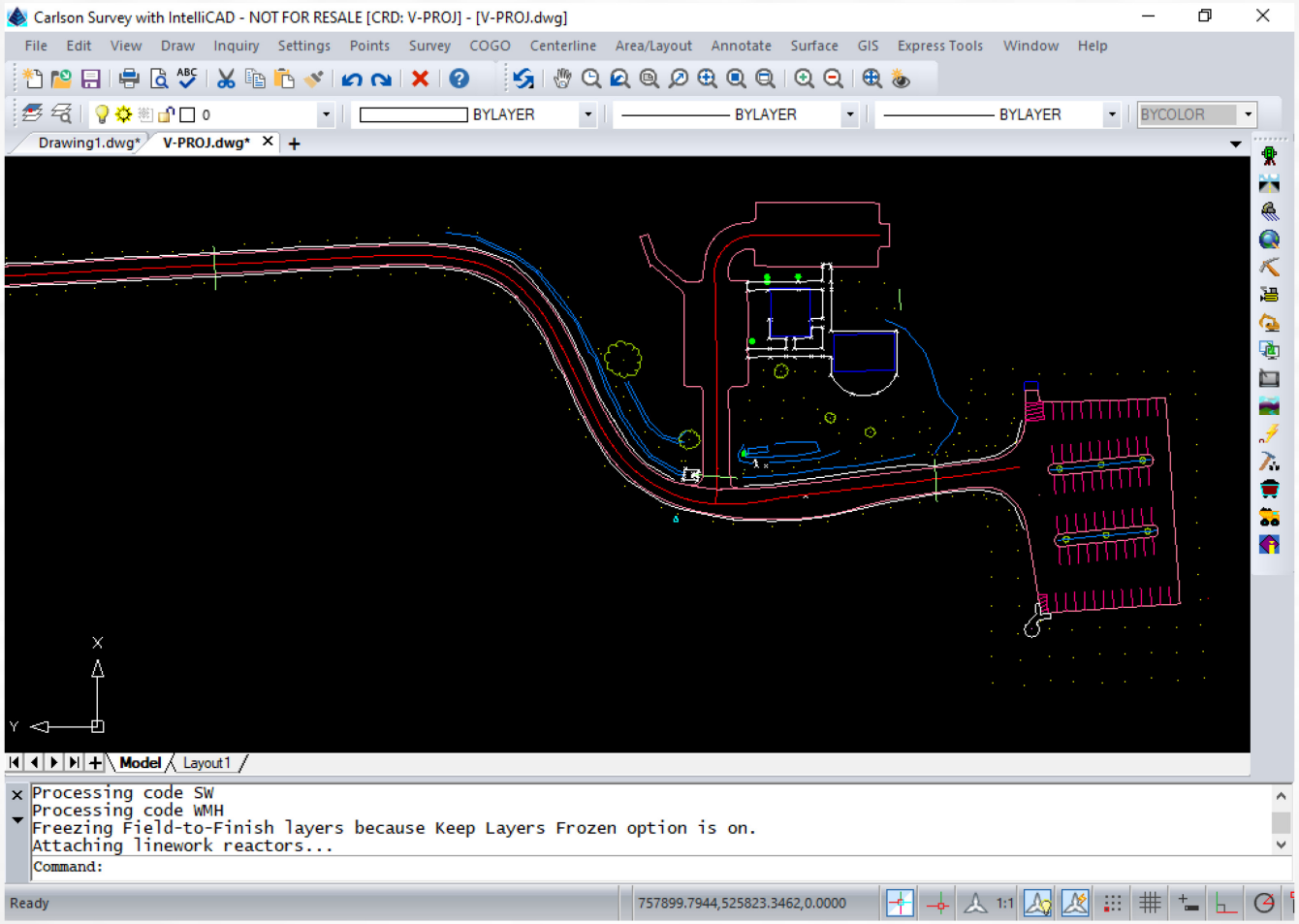
AMALGAMATION



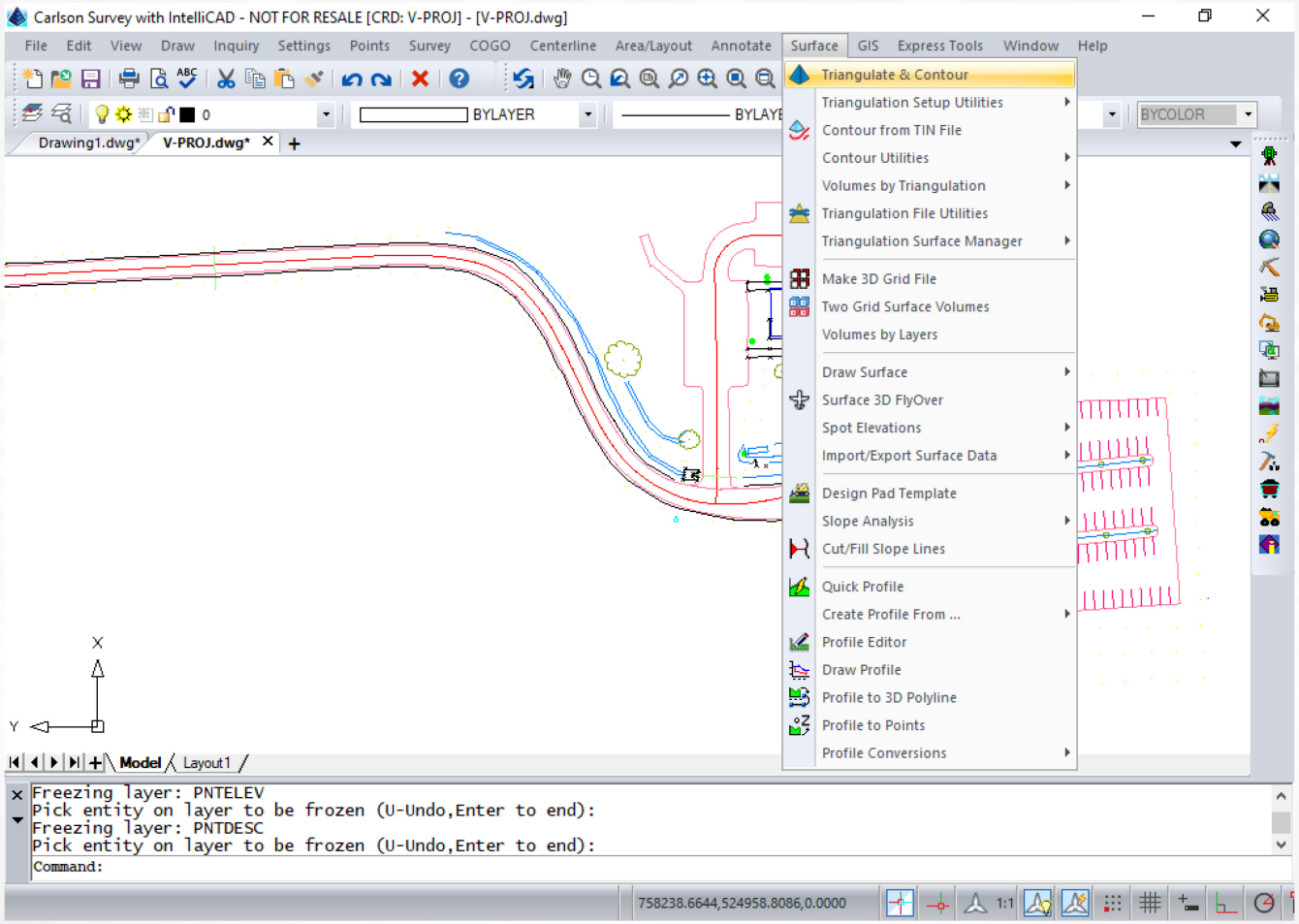
AMALGAMATION



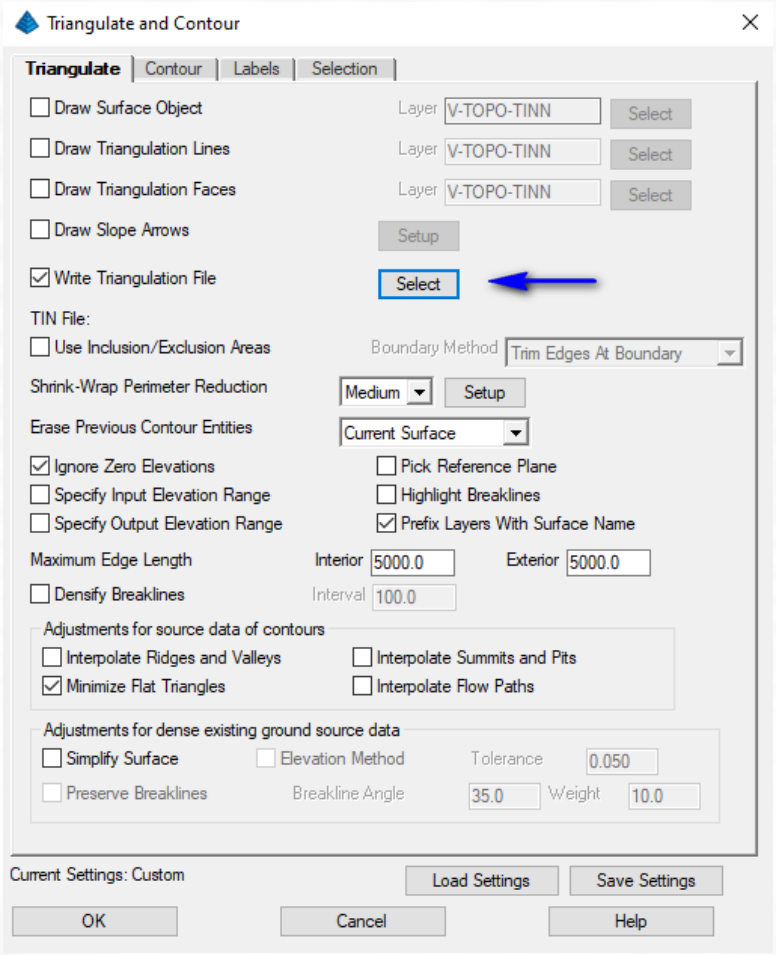
AMALGAMATION



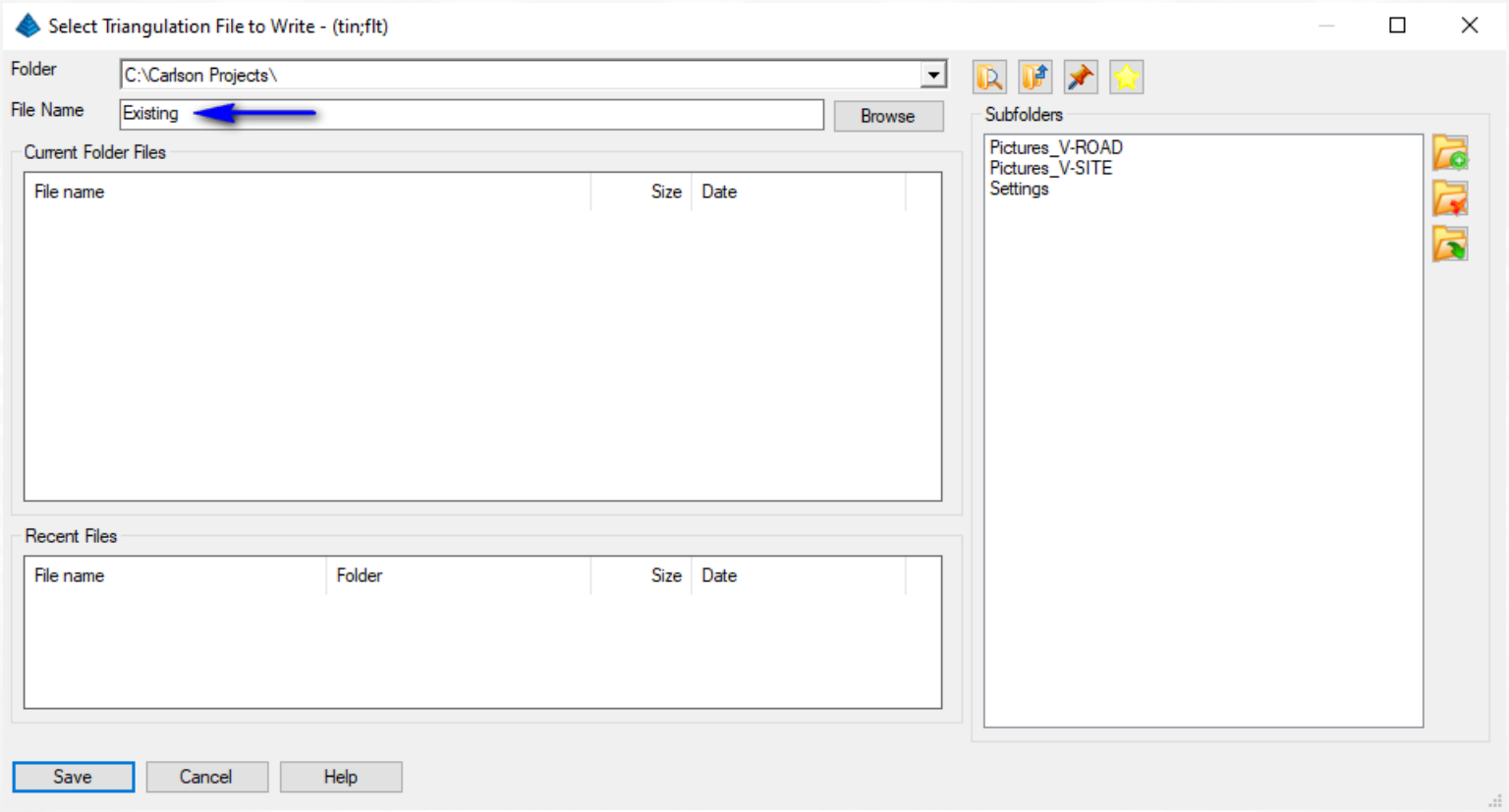
AMALGAMATION



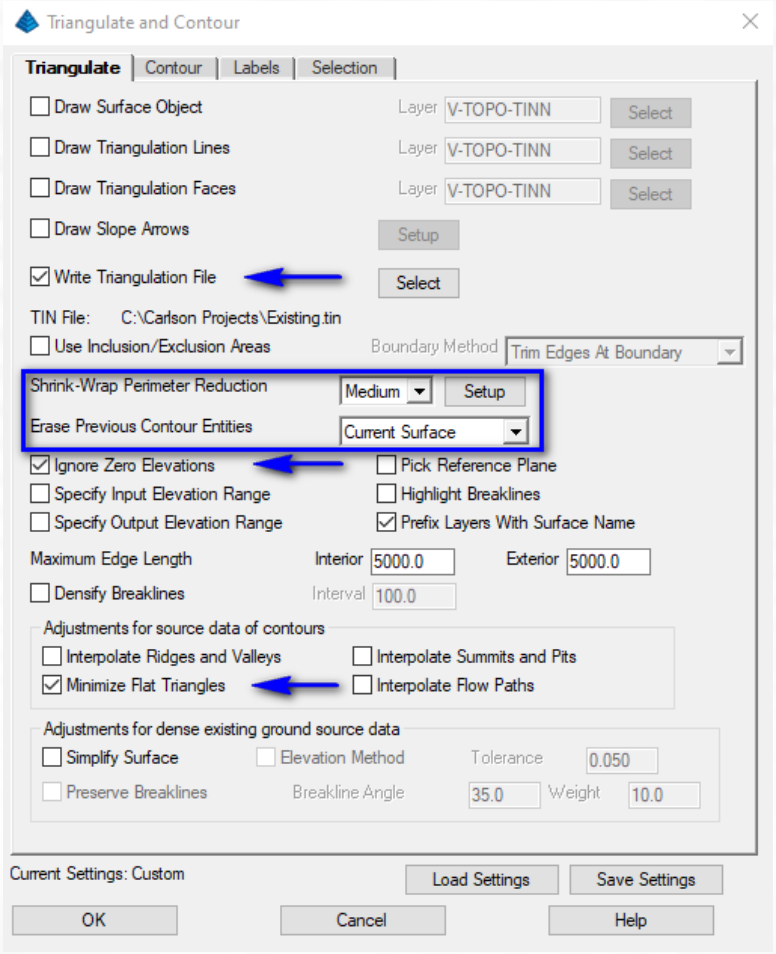
AMALGAMATION



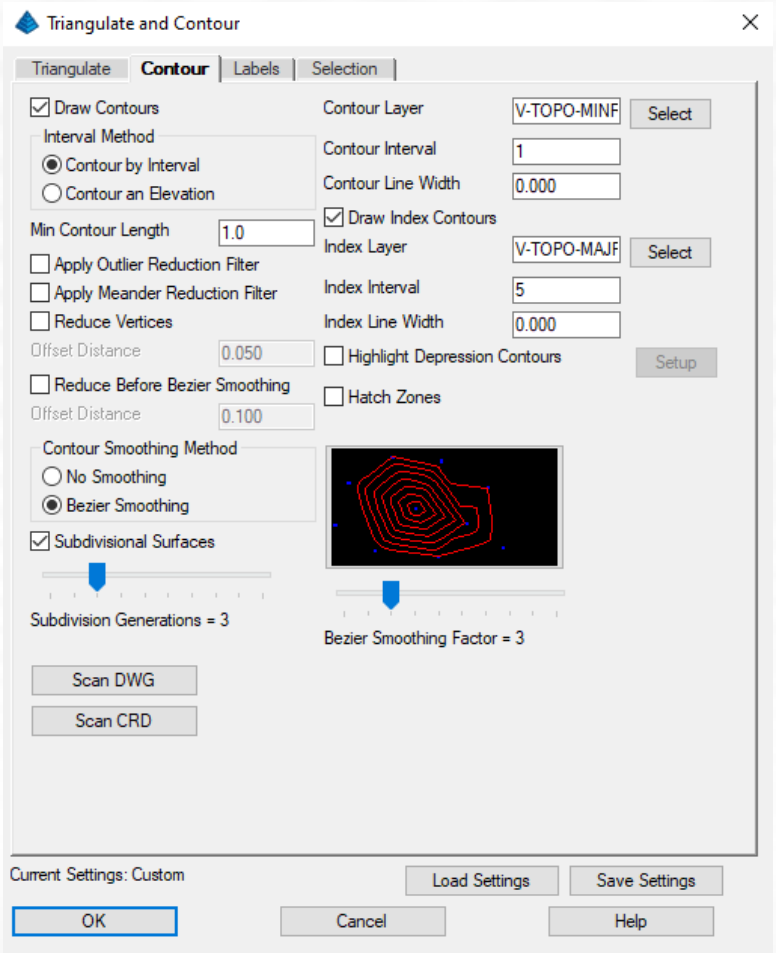
AMALGAMATION



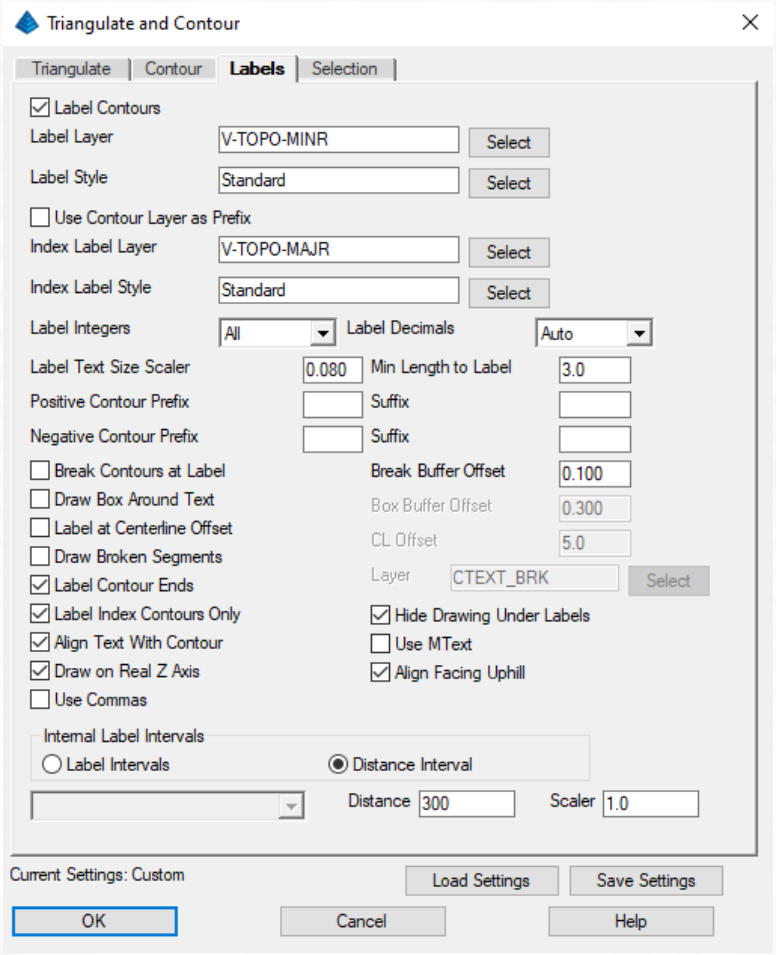
AMALGAMATION



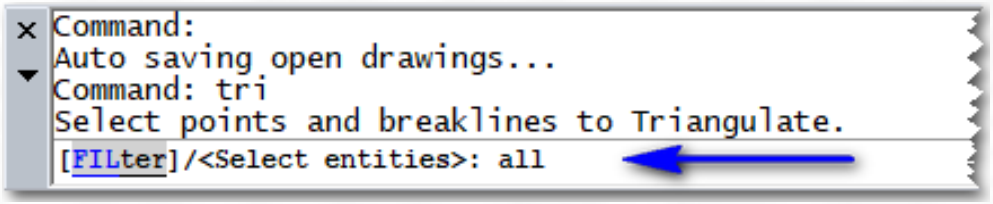
AMALGAMATION



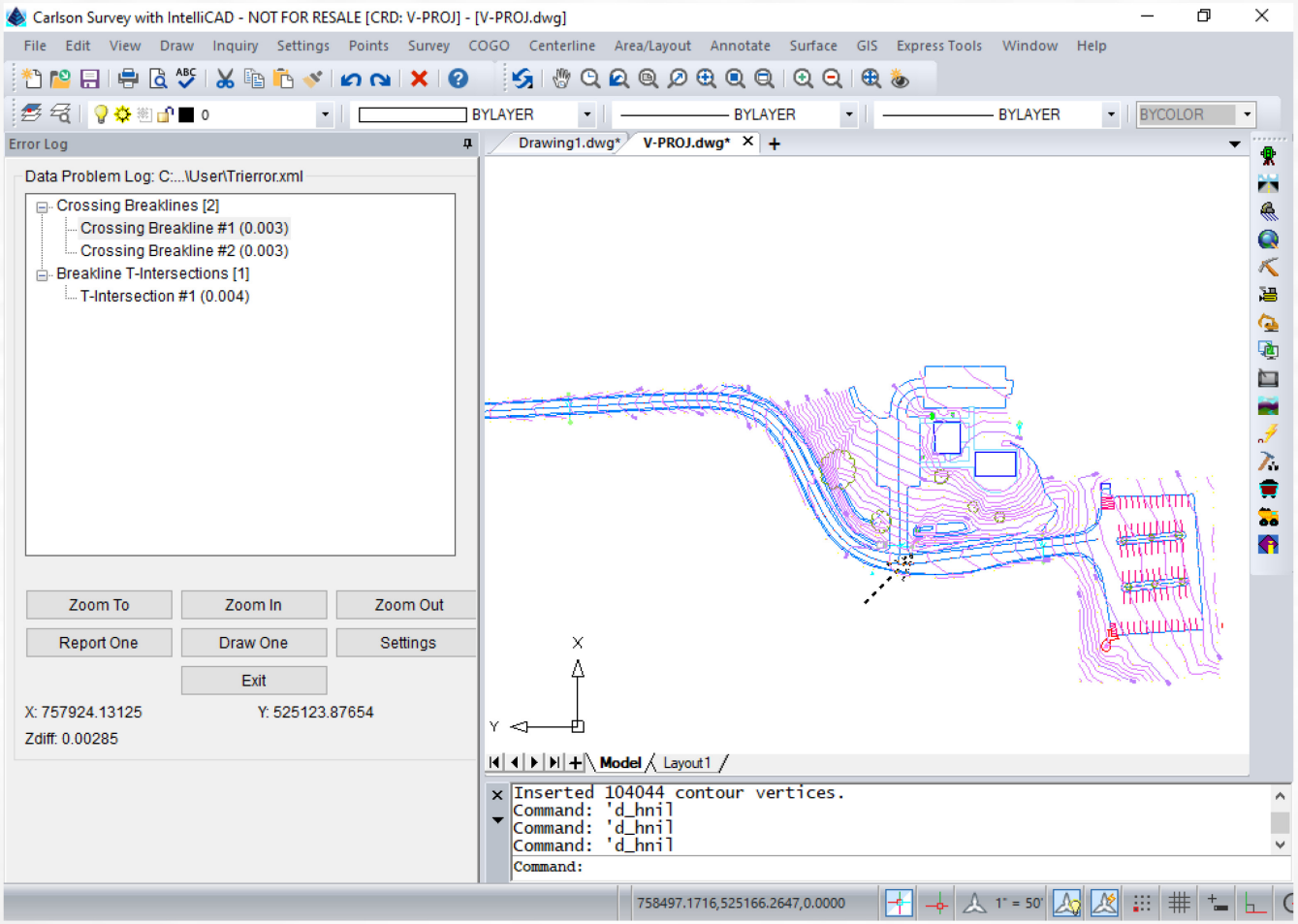
AMALGAMATION



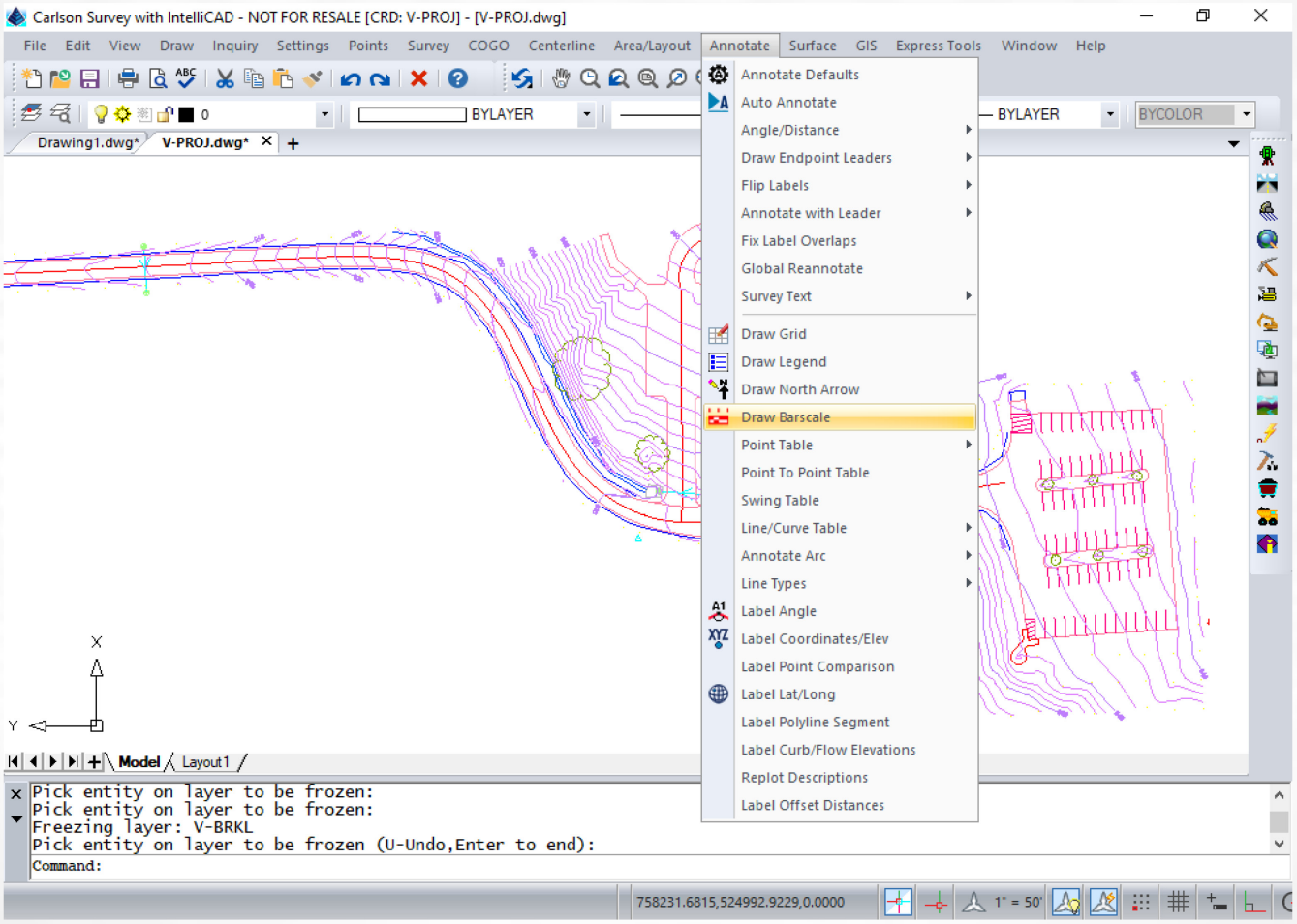
AMALGAMATION



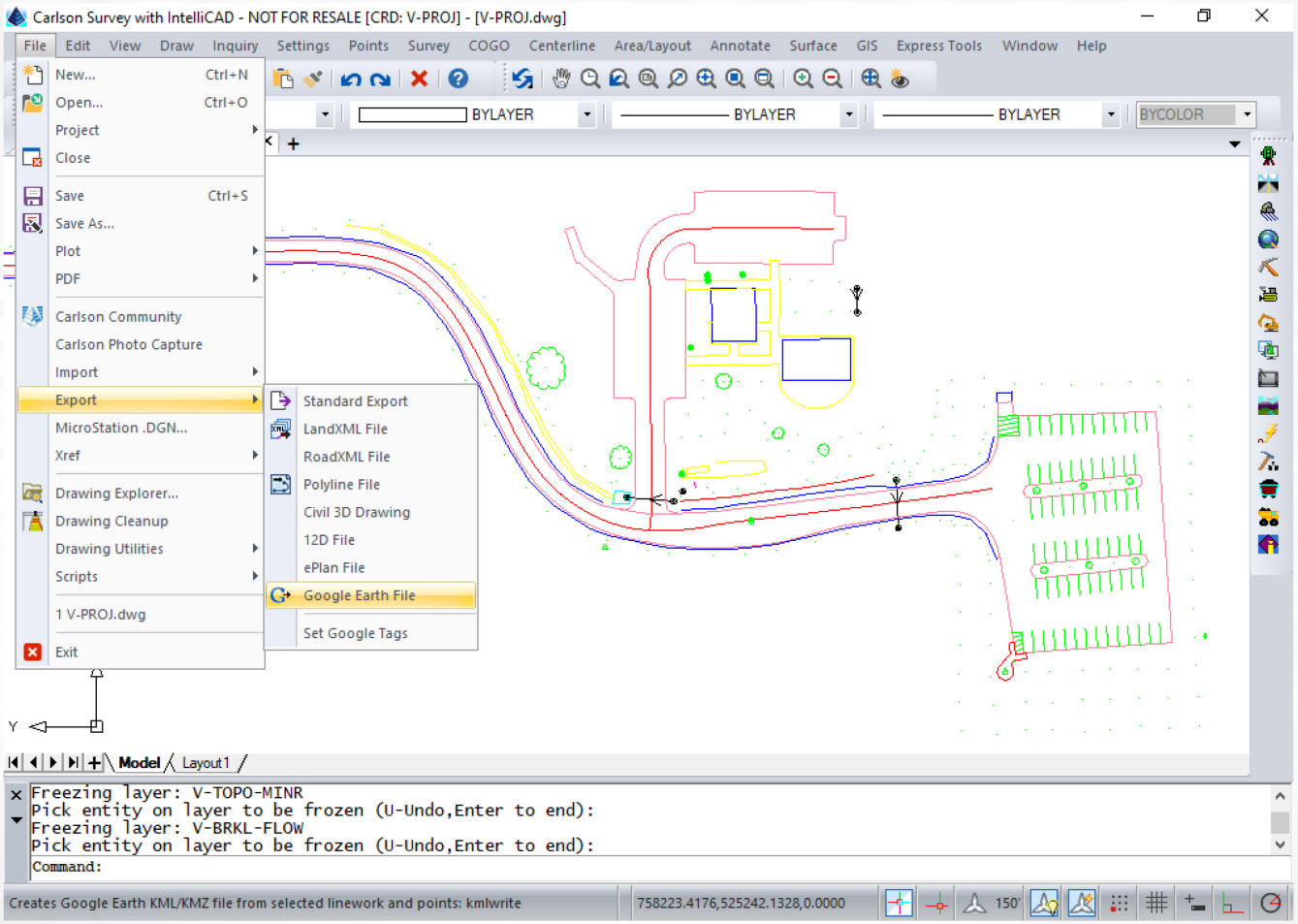
AMALGAMATION



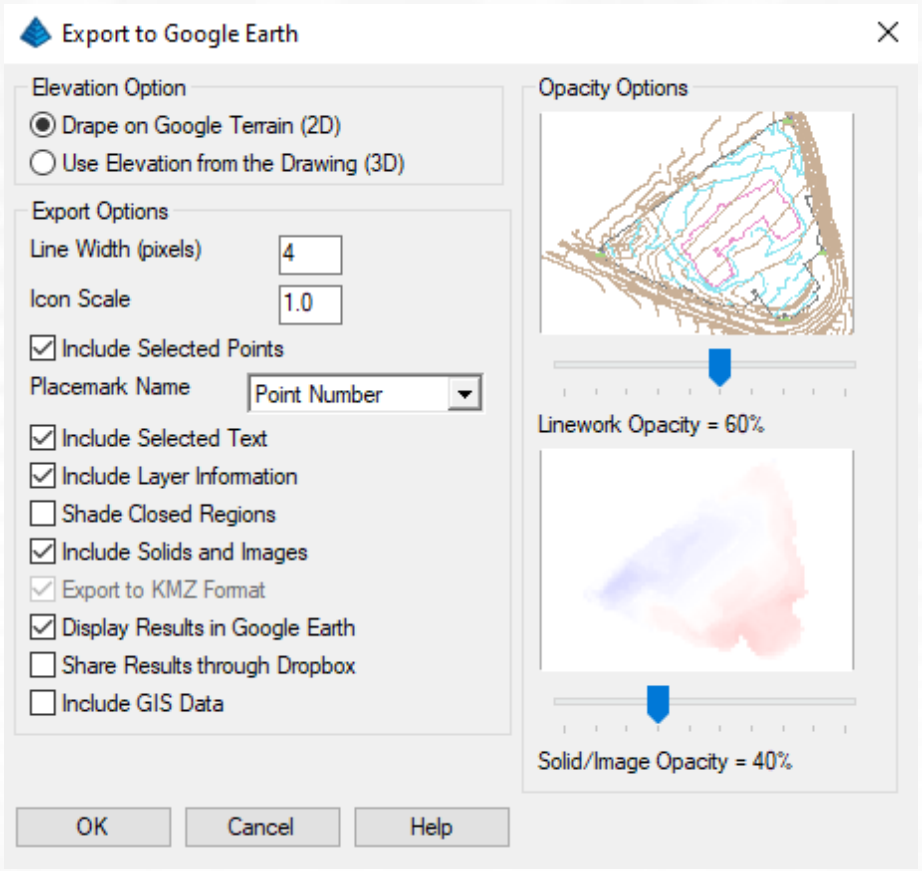
AMALGAMATION



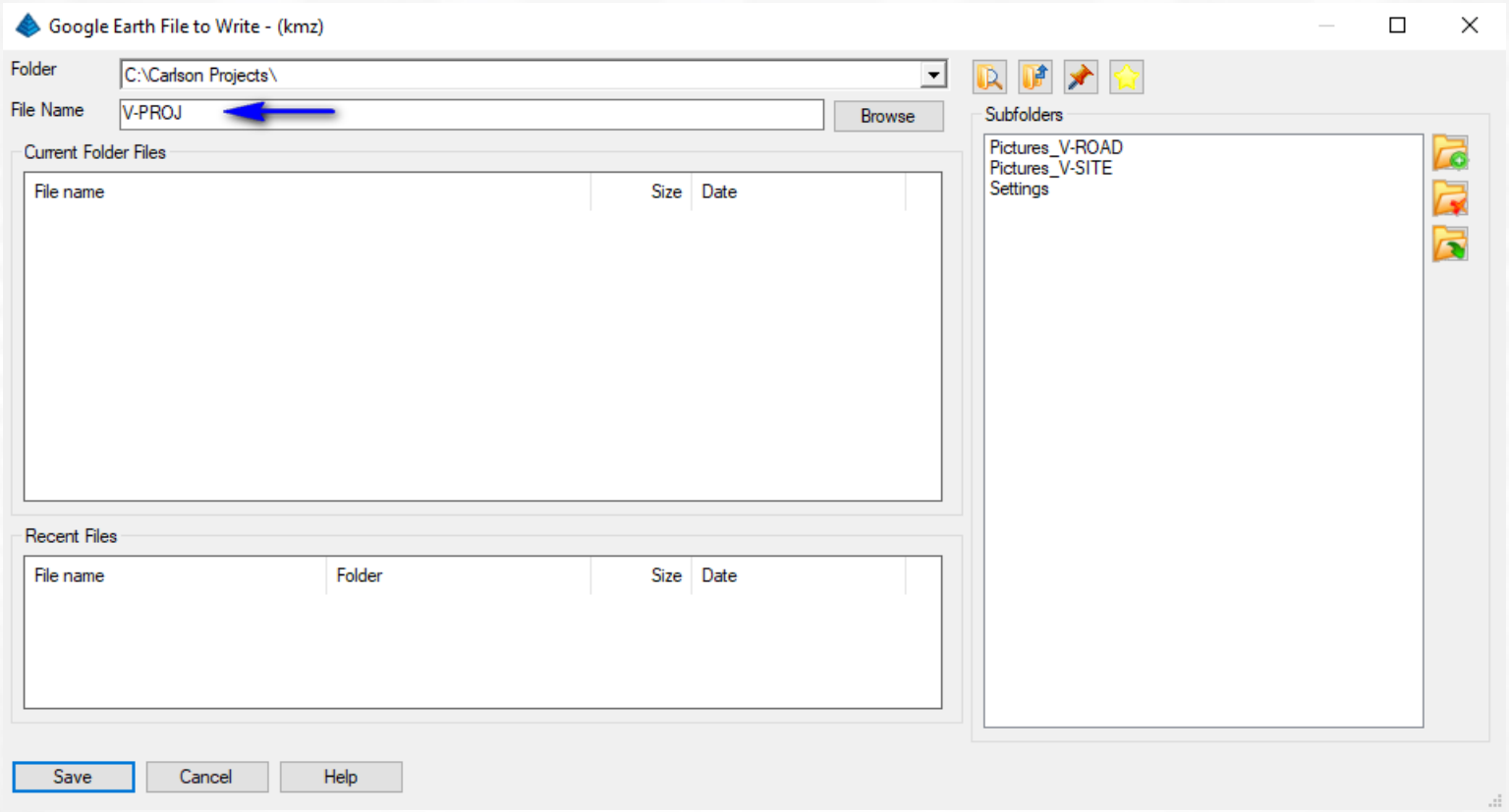
AMALGAMATION



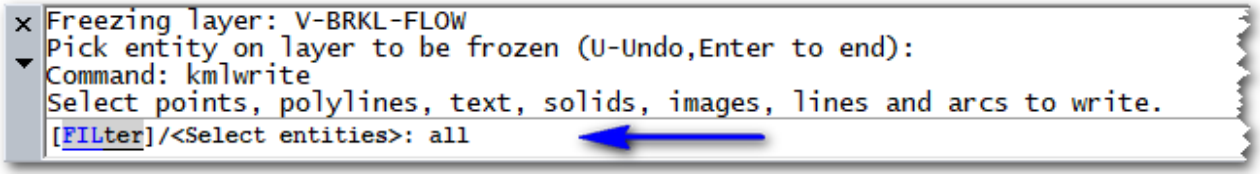
AMALGAMATION



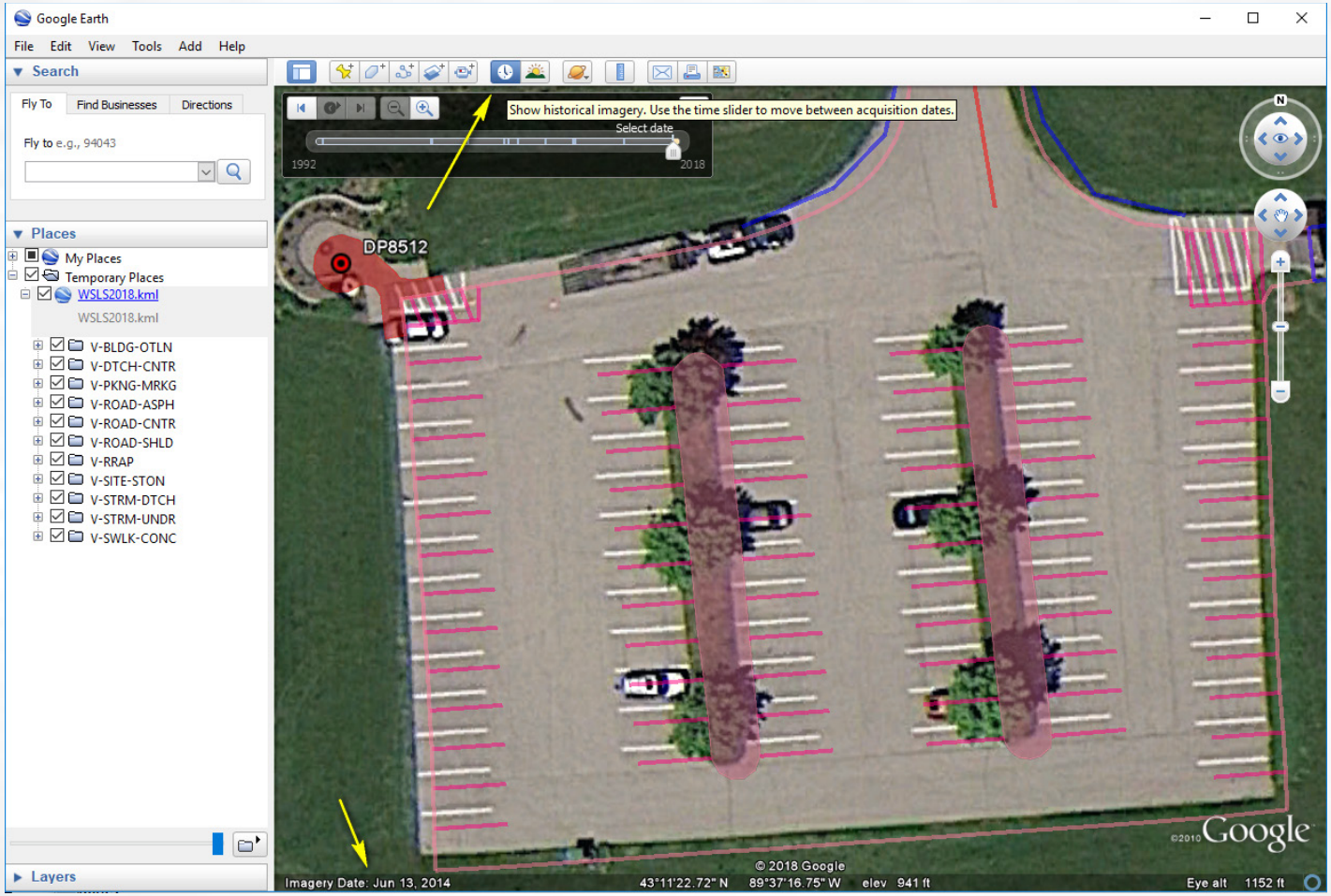
AMALGAMATION



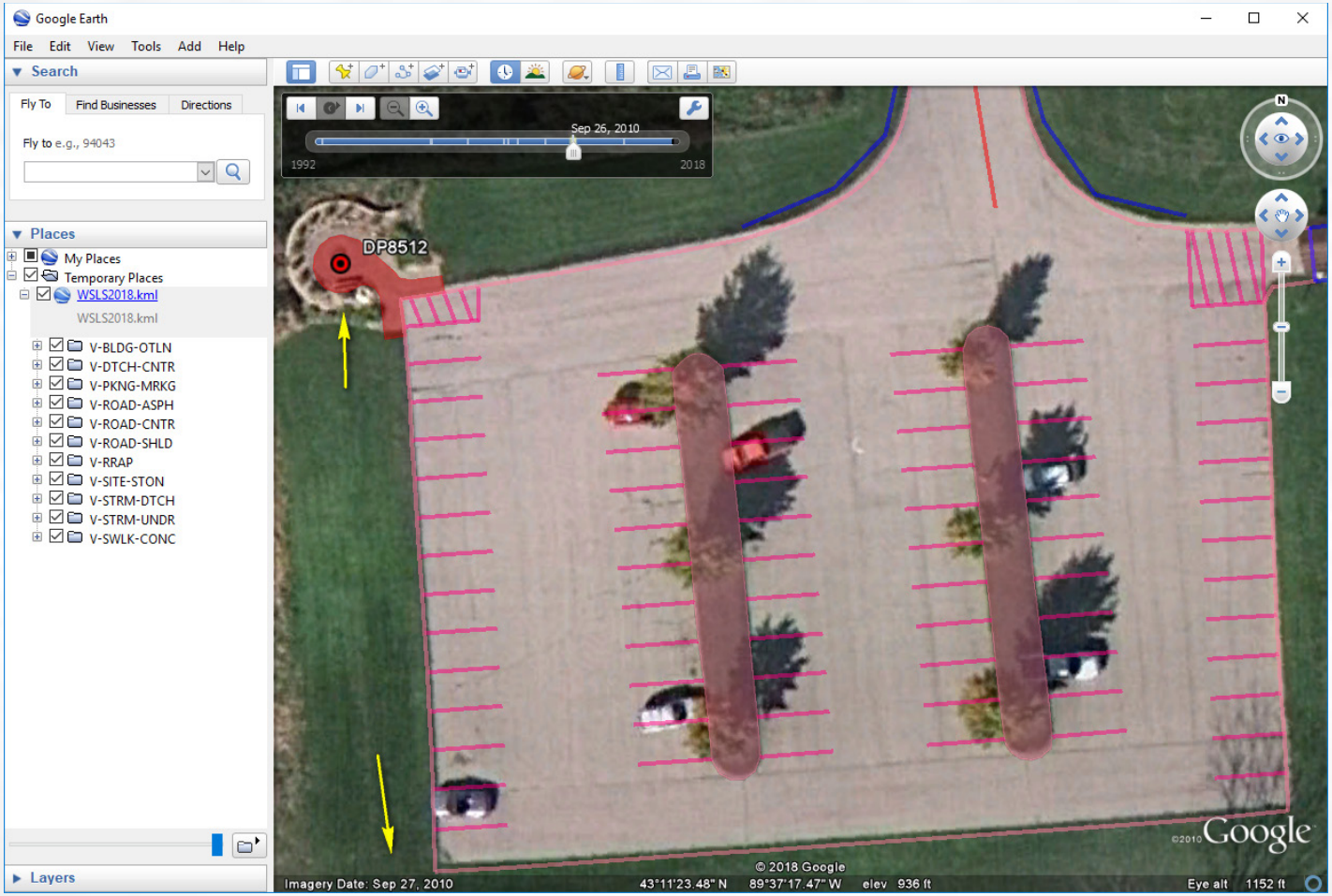
AMALGAMATION



AMALGAMATION



AMALGAMATION



CONCLUSION


THEY CAN JUST CONNECT IT ALL IN THE OFF....
CHAIN IT WHEN YOU SHOOT IT!!!!!!
STFUHERO.COM

It’s An Artist’s World!

Summary

- Feature Coding and Special Code usage in the Field can dramatically simplify office work
- One shot, multiple lines
- See ftp://ftp.dot.wi.gov/dtsd/bpd/methods/survey/ for DOT Code Library
- Prepare Your Drawings for Generations to Come! National CAD Standards can Help!

Summary

- NGS Control - https://www.ngs.noaa.gov/cgi-bin/ds_mark.prl?PidBox=DP8512
- For Better Looking Contours, Attempt Uniformly Spaced Data When Possible
- SurvPC vs. SurvCE, Consider life-span of Windows Mobile Operating System
- Todays Rugged PC Tablets Have the Horsepower to Process Geoids and Larger Data Sets
- Edit-Process Raw Data, Different Job Settings (NAD83, UTM, etc)

For Questions, contact:

- **Ladd Nelson**
  Sales Director - Midwest
  Carlson Software
  563-583-8552 (o)
  402-321-6638 (m)
- lnelson@carlsonsw.com

Thank You!

Carlson
BREAK NEW GROUND