

Chapter 13 – Preparation of the Field Note Package

Policy Statement

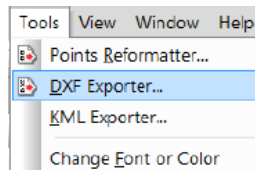
All projects initiated by a formal Survey Request shall be memorialized and archived in the format defined within this document.

Preliminary Actions

Prior to assembling the final field note package, the following files need to be generated from the Star*Net project:

DXF File:

A .DXF file can be exported from Star*Net by clicking **Tools>DXF Exporter** from the main menu.



This file provides a graphic representation of network connectivity and becomes the basis for the Control Establishment Sheets.

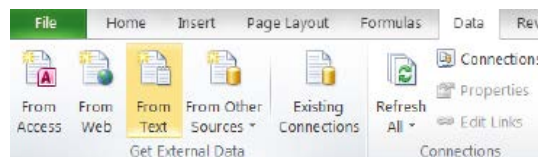
Worksheets for Conventional Observations, GPS Vector Summary, and Final Coordinates:

Excel worksheets are created for the following data sets:

- Conventional observations - extracted from the .DAT files
- GPS Vector Residual Summary - extracted from the .LST file
- Final coordinates with standard deviations (along with a note stating that coordinate standard deviations are reported at 1 sigma or 68% confidence level) - extracted from the .PTS and .LST files

Conventional observation data and the GPS Vector Residual Summary will be shown on the **Control Establishment Sheets**. The coordinate worksheet becomes a live reference for the coordinate table on the **Monument Summary Sheet**. Population of these worksheets is achieved as follows:

1. Open a blank Excel Workbook. From the main menu, click **Data>Get External Data>From Text**.



2. Browse to the desired text file and click **Import**. Follow steps 1-3 in the **Text Import Wizard** and click **Finish**.
3. Add desired column headings and fine tune formatting as needed, then save the file.

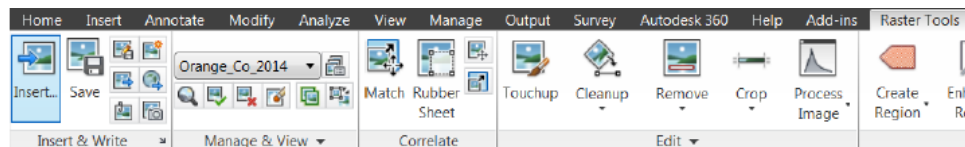
Required Elements of the Final Field Note Package

For convenience and consistency, a template file in .DWG format is located here: (\\lis017)\Civil 3d\OCS Notes.dwg. Open the drawing and save it in the desired location. This file is to be used as the basis for the project Final Note Package and will contain each of the elements described below.

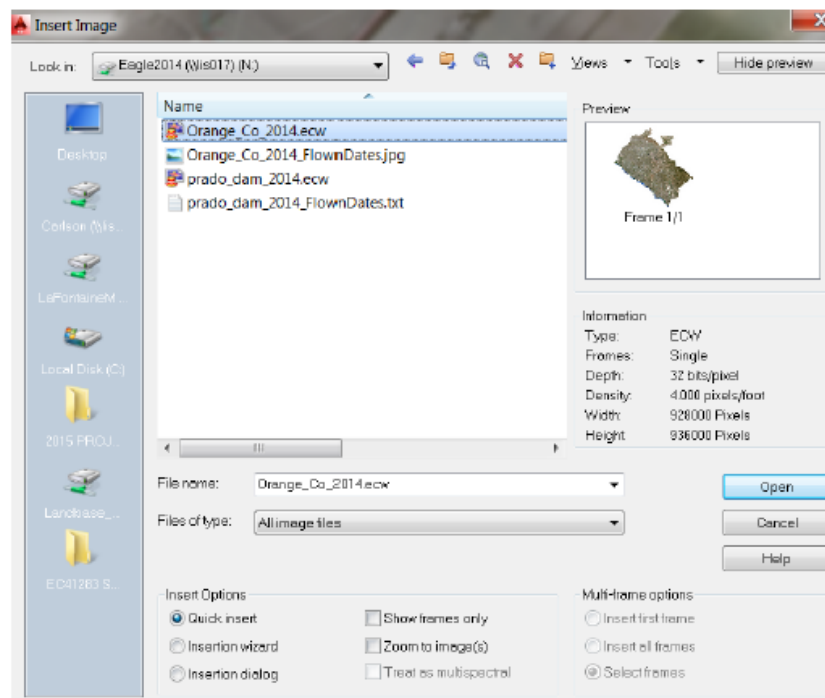
Monument Location Map / Title Sheet:

The Monument Location Map provides a plot of all monuments found and set, georeferenced to aerial imagery. Creation of this sheet is achieved as follows:

1. Import network control points and boundary points into the drawing
2. Add appropriate monument symbols, either by manual placement or by editing the point style. Edit point style labels to display point number only.
3. Insert the most recent Orange County Eagle Aerial imagery. **Important note:** The project coordinate system must be verified before imagery is inserted. From the **Raster Tools** tab, click **Insert Image** or type the command **"iinsert"**.



From the **Insert Image** dialog box, select **Insertion Wizard** as the desired **Insert option**. Browse to **Orange_Co_20xx.ecw** under the Eagle drive (\\lis017\Eagle20xx) and click **Open**. Click **Next** through each menu, accepting the default settings, and click **Finish**.

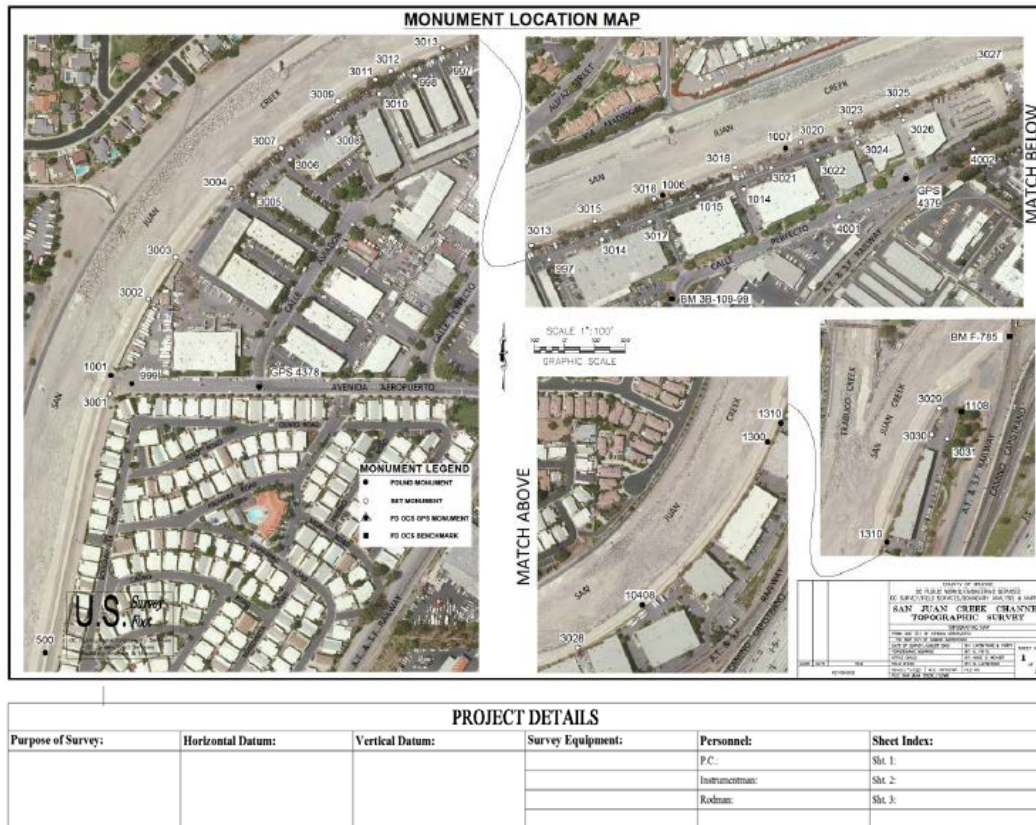


If the image does not appear in the correct location, verify coordinate system and project units.

Important note regarding attachment of images: Images should be loaded prior to printing and then unloaded before closing the drawing. Leaving the image loaded may cause the drawing to create a “fatal error” which will immediately close the program, and all unsaved work will be lost!

4. Place the image on a layer of its own. This will allow the transparency to be adjusted **By Layer** to establish a suitable contrast between image and points. If points are not visible after the image is inserted, change the **Display Order** of the image to **Send to Back**.
5. After point numbers, monument symbols, and aerial image are correctly displayed, the sheets are set up in Paper Space by creating viewports in the correct layout, copying layouts if more sheets are necessary.
6. Once sheets are positioned and scaled in Paper Space, a monument legend, north arrow, scale bar, and miscellaneous text (street names, etc.) are added.
7. Fill out the **Project Details** table at the bottom of the sheet.

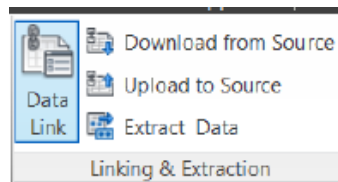
Final Sheet Appearance



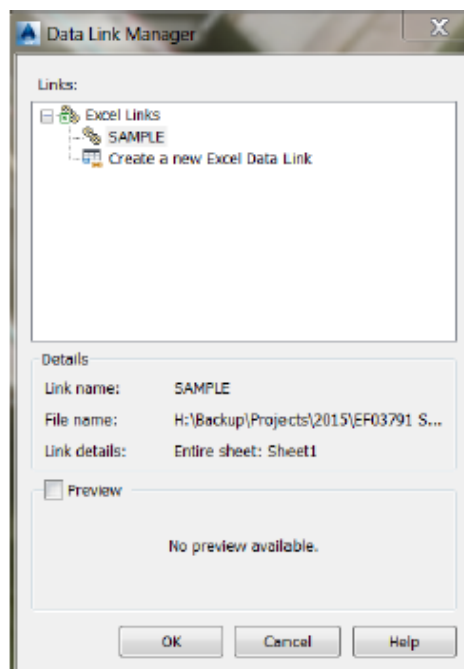
Control Establishment Sheets:

The Control Establishment Sheets provide a graphic representation of how the control points and boundary points were tied to the network. Creation of these sheets is achieved as follows:

1. Open the .DXF file exported from Star*Net, copy the linework from the .DXF, and paste into the proper layer of the new .DWG file.
2. Set up sheets in Paper Space, displaying line connectivity, point numbers, and monument symbols. Add a monument legend and north arrow.
3. **Establishment Notes**, a narrative outlining the control method, control constraints, etc. shall be included. If existing control was used as the basis of the survey, the process which was used to verify the network shall be documented within the narrative.
4. Insert the Excel worksheet containing observation data (created in **“Preliminary Actions”** on Page 1) as follows:
 - a. From the **Insert** tab click **Linking and Extraction>Data Link**, or type the command **“datalink”**.



- b. Click **Create a new Excel Data Link**, name the link, and click **OK**. Browse to the Excel file and click **OK**. Select the sheet to be linked and choose **Link Entire Sheet**, **Link to a Named Range**, or **Link to Range**. Click **OK** and again click **OK**.



- | Title | | |
|--------|--------|--------|
| Header | Header | Header |
| Data | Data | Data |
| Data | Data | Data |
| Data | Data | Data |
| Data | Data | Data |
| Data | Data | Data |
| Data | Data | Data |
| Data | Data | Data |
| Data | Data | Data |

The screenshot shows the "Insert Table" dialog box with the following settings:

 - Table style:** Column-Ctr
 - Insert options:** Start from empty table (selected)
 - Column & row settings:** Columns: 5, Column width: 2.500000, Data rows: 1, Row height: 1 Line(s)
 - Set cell styles:** First row cell style: Title, Second row cell style: Header, All other row cell styles: Data

[illegible]

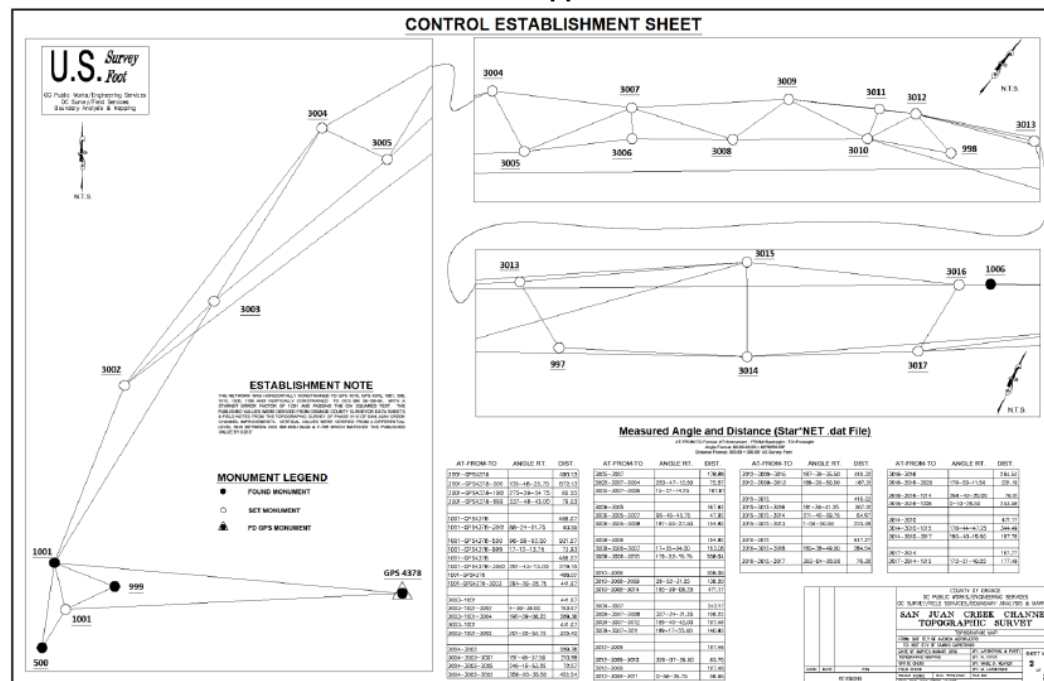
Content from .DAT File to be Imported into Civil 3d

AT-FROM-TO	ANGLE RT.	DIST.
104-5004R1		1572.42
104-5004R1-5013	151-49-10.50	1328.18
5013-104		1328.17
5013-104-105	293-08-55.00	386.16
5013-104-106	253-05-55.75	1378.79
105-5013		386.18
105-5013-103	217-56-58.50	951.53
105-5013-102	220-01-35.50	998.94
105-5013-101	221-53-52.00	1047.70
103-105		951.54
103-105-102	217-45-10.25	59.14
103-105		951.54
103-105-106	48-53-56.00	1474.56
103-105-101	217-36-12.25	118.24
106-103		1474.55
106-103-105	40-10-58.25	1111.31
106-103-5013	53-06-05.75	1378.78
106-103-107	230-46-15.00	809.27
107-106		809.28
107-106-6201	152-00-29.50	116.71

GPS Vector Residual Summary

GPS Vector Residual Summary (FeetUS)							
(Sorted by 2D Residual Length)							
From	To	N	E	Up	2D	3D	Length
OEOC	900	-0.017	0.062	0.148	0.064	0.161	48208
MJPK	957	0.005	0.04	0.036	0.041	0.055	65723
MJPK	957	-0.005	-0.041	-0.162	0.041	0.167	65723
MJPK	933	0.012	-0.032	0.042	0.034	0.054	39843
MJPK	900	0.001	-0.033	-0.006	0.033	0.034	24602
WHYT	957	0.014	0.026	-0.089	0.029	0.093	51049
OEOC	MJPK	0.012	-0.021	-0.008	0.024	0.025	61903
OEOC	933	-0.006	0.022	0.088	0.023	0.091	22158
OEOC	900	0.02	0.004	-0.006	0.02	0.021	48208
OEOC	949	-0.011	0.014	-0.004	0.018	0.019	7048
MJPK	933	0.014	0.01	-0.062	0.017	0.065	39843
WHYT	900	-0.013	-0.01	-0.01	0.016	0.019	7567
WHYT	933	0.015	0	0.02	0.015	0.025	28393
OEOC	949	-0.002	-0.015	-0.031	0.015	0.034	7048
941	933	-0.014	0.005	-0.01	0.014	0.017	7316
949	941	-0.013	0.005	-0.017	0.014	0.022	8788
OEOC	957	0	-0.013	0.019	0.013	0.023	6473
WHYT	900	-0.002	-0.013	0.022	0.013	0.025	7567
910	933	-0.008	0.009	-0.006	0.012	0.014	20494
OEOC	957	-0.003	-0.011	0.006	0.011	0.013	6473
910	900	0.009	-0.005	-0.006	0.01	0.011	8501
WHYT	957	-0.009	-0.004	-0.086	0.01	0.087	51049
MJPK	900	0.001	0.009	-0.033	0.009	0.034	24602
OEOC	WHYT	0.003	-0.009	-0.036	0.009	0.037	45200
933	923	0.007	0.005	-0.003	0.008	0.009	9120

Final Sheet Appearance



Monument Summary Sheets:

The Monument Summary Sheets compile photographs, descriptions, and coordinates of all monuments found or set during the course of the survey. Statistical data, such as coordinate standard deviations or semi-major error ellipses may also be required. Creation of these sheets is achieved as follows:

1. Set up sheets in Paper Space. Insert monument photos – quick insert method can be used, as the photos are not georeferenced.
2. Label monument photos with point numbers and descriptions – type the command “mtext” for multi-line text input.
3. Insert the Excel worksheet containing coordinate data (created in **“Preliminary Actions”** on Page 12-1) by creating a data link (follow the procedures outlined in **“Control Establishment Sheets”**, steps 4a-c on Pages 12-4 through 12-6). Note: Edits to coordinate data should be made within the Excel file – once the changes are saved in Excel, Civil 3d will prompt for update.

Final Sheet Appearance

MONUMENT DESCRIPTION & COORDINATE LIST

MONUMENT DESCRIPTIONS

#997
SET SURVEY MARKER SPIKE & WOOD CAP
WASHER, FLUSH IN ASPHALT

#998
SET 1/2" BANG SPIKE & WOOD CAP WASHER,
FLUSH IN ASPHALT

#999
FOUND 1/2" BANG SPIKE & WOOD CAP WASHER,
FLUSH IN ASPHALT

#1000
FOUND 1" BANG SPIKE & WOOD CAP WASHER,
FLUSH IN ASPHALT

#1001
FOUND 1" BANG SPIKE & WOOD CAP WASHER,
FLUSH IN ASPHALT

#1002
FOUND 1" BANG SPIKE & WOOD CAP WASHER,
FLUSH IN ASPHALT

#1003
FOUND 1" BANG SPIKE & WOOD CAP WASHER,
FLUSH IN ASPHALT

#1004
FOUND 1" BANG SPIKE & WOOD CAP WASHER,
FLUSH IN ASPHALT

#1005
FOUND 1" BANG SPIKE & WOOD CAP WASHER,
FLUSH IN ASPHALT

#1006
FOUND 1" BANG SPIKE & WOOD CAP WASHER,
FLUSH IN ASPHALT

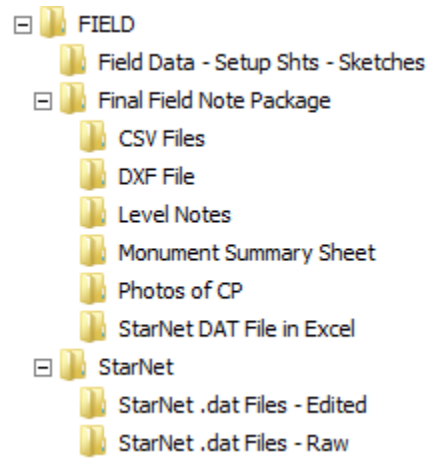
#1007
FOUND 1" BANG SPIKE & WOOD CAP WASHER,
FLUSH IN ASPHALT

Coordinate List (Adjusted using StarNET)

POINT	NORTHING	EASTING	HEIGHT
1001	1001.000	1001.000	1001.000
1002	1002.000	1002.000	1002.000
1003	1003.000	1003.000	1003.000
1004	1004.000	1004.000	1004.000
1005	1005.000	1005.000	1005.000
1006	1006.000	1006.000	1006.000
1007	1007.000	1007.000	1007.000
1008	1008.000	1008.000	1008.000
1009	1009.000	1009.000	1009.000
1010	1010.000	1010.000	1010.000
1011	1011.000	1011.000	1011.000
1012	1012.000	1012.000	1012.000
1013	1013.000	1013.000	1013.000
1014	1014.000	1014.000	1014.000
1015	1015.000	1015.000	1015.000
1016	1016.000	1016.000	1016.000
1017	1017.000	1017.000	1017.000
1018	1018.000	1018.000	1018.000
1019	1019.000	1019.000	1019.000
1020	1020.000	1020.000	1020.000
1021	1021.000	1021.000	1021.000
1022	1022.000	1022.000	1022.000
1023	1023.000	1023.000	1023.000
1024	1024.000	1024.000	1024.000
1025	1025.000	1025.000	1025.000
1026	1026.000	1026.000	1026.000
1027	1027.000	1027.000	1027.000
1028	1028.000	1028.000	1028.000
1029	1029.000	1029.000	1029.000
1030	1030.000	1030.000	1030.000
1031	1031.000	1031.000	1031.000
1032	1032.000	1032.000	1032.000
1033	1033.000	1033.000	1033.000
1034	1034.000	1034.000	1034.000
1035	1035.000	1035.000	1035.000
1036	1036.000	1036.000	1036.000
1037	1037.000	1037.000	1037.000
1038	1038.000	1038.000	1038.000
1039	1039.000	1039.000	1039.000
1040	1040.000	1040.000	1040.000
1041	1041.000	1041.000	1041.000
1042	1042.000	1042.000	1042.000
1043	1043.000	1043.000	1043.000
1044	1044.000	1044.000	1044.000
1045	1045.000	1045.000	1045.000
1046	1046.000	1046.000	1046.000
1047	1047.000	1047.000	1047.000
1048	1048.000	1048.000	1048.000
1049	1049.000	1049.000	1049.000
1050	1050.000	1050.000	1050.000
1051	1051.000	1051.000	1051.000
1052	1052.000	1052.000	1052.000
1053	1053.000	1053.000	1053.000
1054	1054.000	1054.000	1054.000
1055	1055.000	1055.000	1055.000
1056	1056.000	1056.000	1056.000
1057	1057.000	1057.000	1057.000
1058	1058.000	1058.000	1058.000
1059	1059.000	1059.000	1059.000
1060	1060.000	1060.000	1060.000
1061	1061.000	1061.000	1061.000
1062	1062.000	1062.000	1062.000
1063	1063.000	1063.000	1063.000
1064	1064.000	1064.000	1064.000
1065	1065.000	1065.000	1065.000
1066	1066.000	1066.000	1066.000
1067	1067.000	1067.000	1067.000
1068	1068.000	1068.000	1068.000
1069	1069.000	1069.000	1069.000
1070	1070.000	1070.000	1070.000
1071	1071.000	1071.000	1071.000
1072	1072.000	1072.000	1072.000
1073	1073.000	1073.000	1073.000
1074	1074.000	1074.000	1074.000
1075	1075.000	1075.000	1075.000
1076	1076.000	1076.000	1076.000
1077	1077.000	1077.000	1077.000
1078	1078.000	1078.000	1078.000
1079	1079.000	1079.000	1079.000
1080	1080.000	1080.000	1080.000
1081	1081.000	1081.000	1081.000
1082	1082.000	1082.000	1082.000
1083	1083.000	1083.000	1083.000
1084	1084.000	1084.000	1084.000
1085	1085.000	1085.000	1085.000
1086	1086.000	1086.000	1086.000
1087	1087.000	1087.000	1087.000
1088	1088.000	1088.000	1088.000
1089	1089.000	1089.000	1089.000
1090	1090.000	1090.000	1090.000
1091	1091.000	1091.000	1091.000
1092	1092.000	1092.000	1092.000
1093	1093.000	1093.000	1093.000
1094	1094.000	1094.000	1094.000
1095	1095.000	1095.000	1095.000
1096	1096.000	1096.000	1096.000
1097	1097.000	1097.000	1097.000
1098	1098.000	1098.000	1098.000
1099	1099.000	1099.000	1099.000
1100	1100.000	1100.000	1100.000
1101	1101.000	1101.000	1101.000
1102	1102.000	1102.000	1102.000
1103	1103.000	1103.000	1103.000
1104	1104.000	1104.000	1104.000
1105	1105.000	1105.000	1105.000
1106	1106.000	1106.000	1106.000
1107	1107.000	1107.000	1107.000
1108	1108.000	1108.000	1108.000
1109	1109.000	1109.000	1109.000
1110	1110.000	1110.000	1110.000
1111	1111.000	1111.000	1111.000
1112	1112.000	1112.000	1112.000
1113	1113.000	1113.000	1113.000
1114	1114.000	1114.000	1114.000
1115	1115.000	1115.000	1115.000
1116	1116.000	1116.000	1116.000
1117	1117.000	1117.000	1117.000
1118	1118.000	1118.000	1118.000
1119	1119.000	1119.000	1119.000
1120	1120.000	1120.000	1120.000
1121	1121.000	1121.000	1121.000
1122	1122.000	1122.000	1122.000
1123	1123.000	1123.000	1123.000
1124	1124.000	1124.000	1124.000
1125	1125.000	1125.000	1125.000
1126	1126.000	1126.000	1126.000
1127	1127.000	1127.000	1127.000
1128	1128.000	1128.000	1128.000
1129	1129.000	1129.000	1129.000
1130	1130.000	1130.000	1130.000
1131	1131.000	1131.000	1131.000
1132	1132.000	1132.000	1132.000
1133	1133.000	1133.000	1133.000
1134	1134.000	1134.000	1134.000
1135	1135.000	1135.000	1135.000
1136	1136.000	1136.000	1136.000
1137	1137.000	1137.000	1137.000
1138	1138.000	1138.000	1138.000
1139	1139.000	1139.000	1139.000
1140	1140.000	1140.000	1140.000
1141	1141.000	1141.000	1141.000
1142	1142.000	1142.000	1142.000
1143	1143.000	1143.000	1143.000
1144	1144.000	1144.000	1144.000
1145	1145.000	1145.000	1145.000
1146	1146.000	1146.000	1146.000
1147	1147.000	1147.000	1147.000
1148	1148.000	1148.000	1148.000
1149	1149.000	1149.000	1149.000
1150	1150.000	1150.000	1150.000
1151	1151.000	1151.000	1151.000
1152	1152.000	1152.000	1152.000
1153	1153.000	1153.000	1153.000
1154	1154.000	1154.000	1154.000
1155	1155.000	1155.000	1155.000
1156	1156.000	1156.000	1156.000
1157	1157.000	1157.000	1157.000
1158	1158.000	1158.000	1158.000
1159	1159.000	1159.000	1159.000
1160	1160.000	1160.000	1160.000
1161	1161.000	1161.000	1161.000
1162	1162.000	1162.000	1162.000
1163	1163.000	1163.000	1163.000
1164	1164.000	1164.000	1164.000
1165	1165.000	1165.000	1165.000
1166	1166.000	1166.000	1166.000
1167	1167.000	1167.000	1167.000
1168	1168.000	1168.000	1168.000
1169	1169.000	1169.000	1169.000
1170	1170.000	1170.000	1170.000
1171	1171.000	1171.000	1171.000
1172	1172.000	1172.000	1172.000
1173	1173.000	1173.000	1173.000
1174	1174.000	1174.000	1174.000
1175	1175.000	1175.000	1175.000
1176	1176.000	1176.000	1176.000
1177	1177.000	1177.000	1177.000
1178	1178.000	1178.000	1178.000
1179	1179.000	1179.000	1179.000
1180	1180.000	1180.000	1180.000
1181	1181.000	1181.000	1181.000
1182	1182.000	1182.000	1182.000
1183	1183.000	1183.000	1183.000
1184	1184.000	1184.000	1184.000
1185	1185.000	1185.000	1185.000
1186	1186.000	1186.000	1186.000
1187	1187.000	1187.000	1187.000
1188	1188.000	1188.000	1188.000
1189	1189.000	1189.000	1189.000
1190	1190.000	1190.000	1190.000
1191	1191.000	1191.000	1191.000
1192	1192.000	1192.000	1192.000
1193	1193.000	1193.000	1193.000
1194	1194.000	1194.000	1194.000
1195	1195.000	1195.000	1195.000
1196	1196.000	1196.000	1196.000
1197	1197.000	1197.000	1197.000
1198	1198.000	1198.000	1198.000
1199	1199.000	1199.000	1199.000
1200	1200.000	1200.000	1200.000
1201	1201.000	1201.000	1201.000
1202	1202.000	1202.000	1202.000
1203	1203.000	1203.000	1203.000
1204	1204.000	1204.000	1204.000
1205	1205.000	1205.000	1205.000
1206	1206.000	1206.000	1206.000
1207	1207.000	1207.000	1207.000
1208	1208.000	1208.000	1208.000
1209	1209.000	1209.000	1209.000
1210	1210.000	1210.000	1210.000
1211	1211.000	1211.000	1211.000
1212	1212.000	1212.000	1212.000
1213	1213.000	1213.000	1213.000
1214	1214.000	1214.000	1214.000
1215	1215.000	1215.000	1215.000
1216	1216.000	1216.000	1216.000
1217	1217.000	1217.000	1217.000
1218	1218.000	1218.000	1218.000
1219	1219.000	1219.000	1219.000
1220	1220.000	1220.000	1220.000
1221	1221.000	1221.000	1221.000
122			

Field File Organization

Data for all projects initiated by a formal Survey Request shall be organized on the Field Survey Server as detailed below:



1. Field Data - Setup Shts - Sketches: Setup sheets; field sketches; raw files (JOB, DC, CSV attribute files, etc.)
2. Final Field Note Package:
 - a. (Root): Final Field Note Package DWG and signed PDF files
 - b. CSV Files: CSV files with final adjusted coordinates of control and boundary points in P,N,E,Z format
 - c. DXF File: DXF file(s) exported from Star*Net project(s) (see page 12-1 for instructions on creating DXF files)
 - d. Level Notes: Level notes in spreadsheet format, showing closures
 - e. Monument Summary Sheet: Excel spreadsheet listing coordinates and descriptions of all monuments tied to the survey, along with horizontal and vertical datum statements and a detailed narrative explaining the horizontal and vertical control strategy; points searched for and not found (SNF) should also be listed, along with a description of the search process
 - f. Photos of CP: Photos of control points (only necessary if the Monument App was down at the time the photos were captured); photos of the search area of points searched for and not found (SNF) should also be included
 - g. StarNet DAT File in Excel: Excel spreadsheet showing Star*Net DAT file data (follow steps 4a-4c on Pages 12-4 through 12-6 for instructions on creating this spreadsheet)
3. StarNet: Star*Net project files (.SNPROJ)
 - a. StarNet .dat Files - Edited: Topo edit logs; edited DAT files, following this required naming convention: [Abbreviated Project Name] [Task] [Date] [Crew – if more than one crew is involved] Edited.dat (e.g. Hazard Topo 8-25-18 EM Edited.dat)
 - b. StarNet .dat Files - Raw: Unedited DAT files, following this required naming convention: [Abbreviated Project Name] [Task] [Date] [Crew – if more than one crew is involved] Raw.dat (e.g. Hazard Topo 8-25-18 EM Raw.dat)