**STATION OFFSET**

**FILTER**

**USER**

**MANUAL**

***Created August, 2011***

SOUTH CAROLINA

DEPARTMENT OF TRANSPORTATION

Station Offset Text Creation Guide

A brief tutorial of Station Offset Text information creation and the use of the Station Offset Filter.

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# Preface

Historically, land surveys for SCDOT roadway design were performed by using a Baseline method, whereas, a centerline alignment was staked in the field and topographic data was collected by measuring distances to the staked alignment. Therefore, the information in the field-book would consist of station and offset and description of all topographic features.

Modern land surveys are collected either by conventional radial surveying (total stations) or various forms of GPS methodology with field computers in which data is stored, or by photogrammetric surveys. Topographic feature data is collected into a database with their positions determined by coordinate geometry.

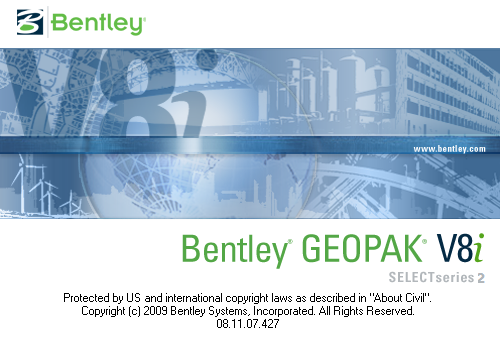
SCDOT, while graphically depicting surveyed topographic features, includes stations and offset measurement from the pre-construction alignments in all construction plans. Deriving this data for surveyed features is no longer a pre-process action, but a post-process routine using a Coordinate Geometry (COGO) program within a CADD platform.

# Procedural Overview

The basic steps required to accurately create a Station Offset Text (SOT) file is combined into two (2) major functions:

* **Extracting Survey Points** from COGO database as referenced to all survey alignment chains
* Using the **Station Offset Filter (SOF)** to eliminate unwanted data.

The instructions present herein are compiled for use with Bentley Geopak V8*i*. Other version of Geopak, newer or older, may differ significantly in process.



# Station Offset Filter Manager Contact

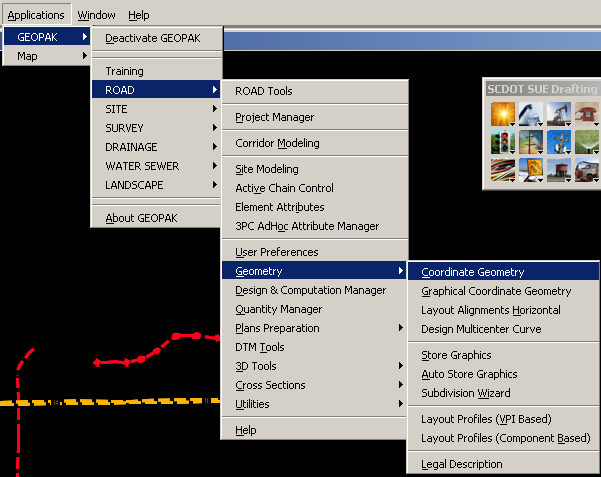
These instructions are intended to be used by personnel with working knowledge of GeoPak and Coordinate Geometry functions as well as Microsoft Excel. Any assistance or trouble shooting of the Station Offset Filter can be obtained by contacting the SOF manager Steven Bailey at 737-2047 or [baileysc@scdot.org](mailto:baileysc@scdot.org).

# Extracting Survey Data from COGO

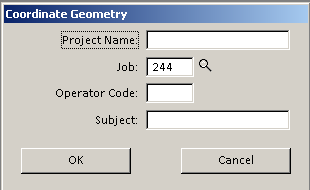
All geometric data created by the survey department is combined into the “gpk” including:

* Topographic data – spot elevations & breaklines
* Planimetric data – topographic feature points and survey chains
* Reference Alignments – best fit existing roadway alignments

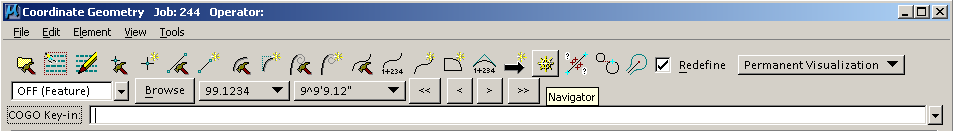
To open the COGO menu, go to Applications/GEOPAK/Road/Geometry/Coordinate Geometry



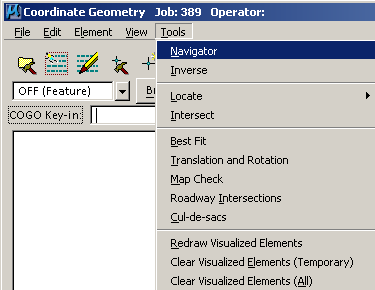
Select the project “gpk” file



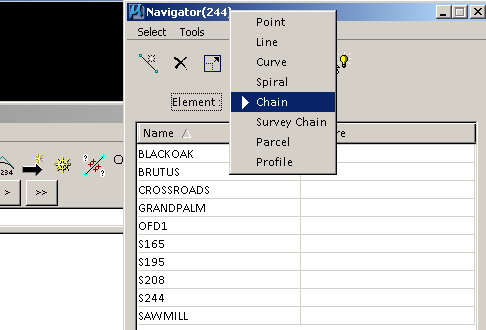
From the COGO menu, select the Navigator function to view the project database



Or open the Navigator through Tools/Navigator

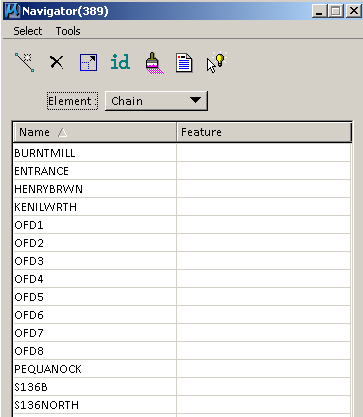


From the Navigator “Element” tab, all of the geometry of the database can be reviewed



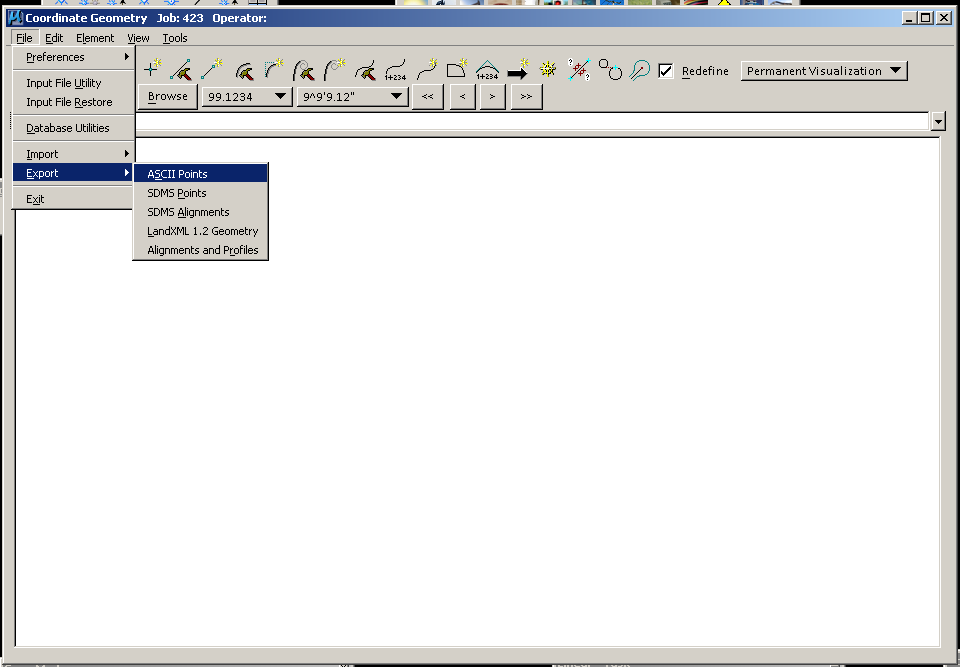
Under the “Chain” tab, all of the project reference alignments are stored. Review chains to determine which alignments will not require station offset information (outfall ditches, small side roads, etc). The Project Engineer determines which alignments will be referenced in the construction plans.

Outfall Ditch (OFD) alignments usually do not need Station Offset Data



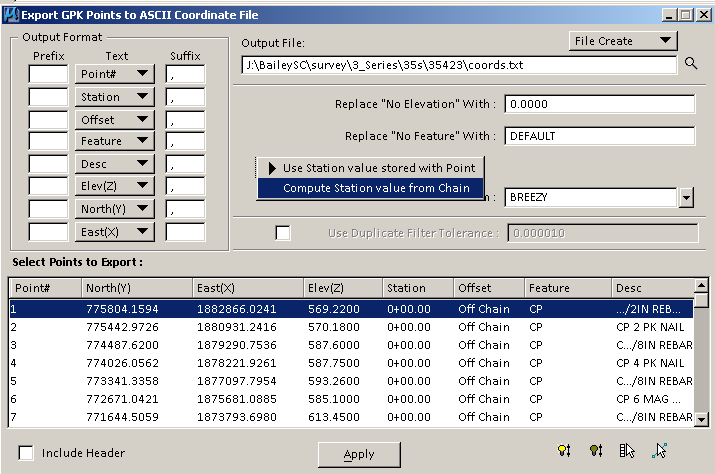
Short alignments may be entrances to parking lots of subdivision.

Once applicable chains are selected, in the COGO menu go to File/Export/ASCII



Several settings must be adjusted within the Export to ASCII menu. Here are the steps to exporting COGO points from the “gpk” to a comma delineated text file:

1. Change the Output Format to have no Prefixes, place commas for the Suffixes, and place the Text in the following order: **Point#, Station, Offset, Feature, Desc, Elev(Z), North(Y), East(X).**
2. Toggle **Use Station value stored with Point** to **Compute Station value from Chain.**
3. Select reference chain.
4. Select a file name that corresponds with the Chain name (breezy.txt).
5. Order the Points in the lower window to be listed by Station from lowest to highest.
6. Highlight points that have station values (points away from selected Chain will show “Off Chain”.
7. Select **Apply** at the bottom of the window.
8. Select the next require reference alignment/chain (3) and repeat steps 3 thru 7 for each required Chains. A separate text file needs to be created for each alignment choosen.



The resulting text file should appear as follows:

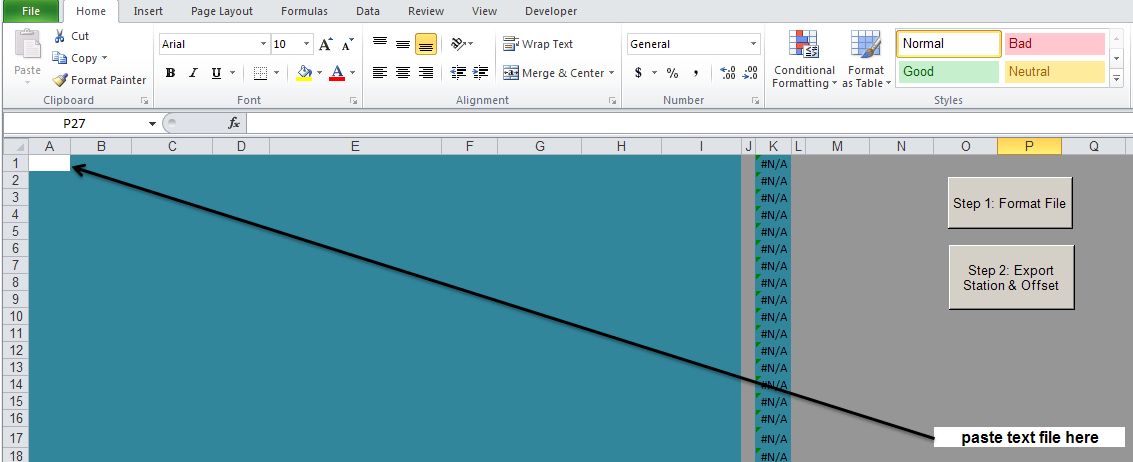
Point#, Station, Offset, Feature, Desc, Elev(Z), Noth(Y), East(X)

28,10+00.00,0.0000,PI,PI 28+52.67/10+00.00,0.0000,428877.9277,2253224.9524

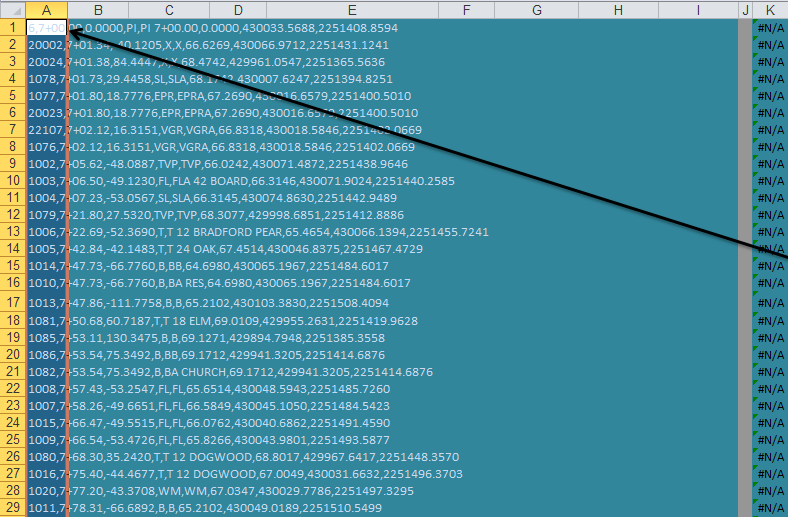
1393,10+00.15,1800.2332,FL,FL,56.0773,430059.6799,2251866.9018

# Using the Station Offset Filter

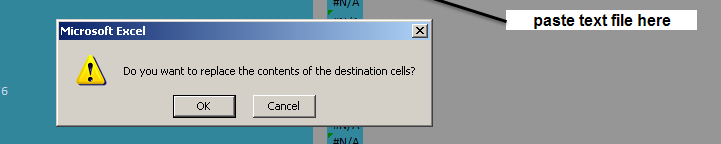
Once the files are prepared, they are ready for the **SOF** program. It is imperative that users not modify the Excel file in anyway and follow the instructions as closely as possible.



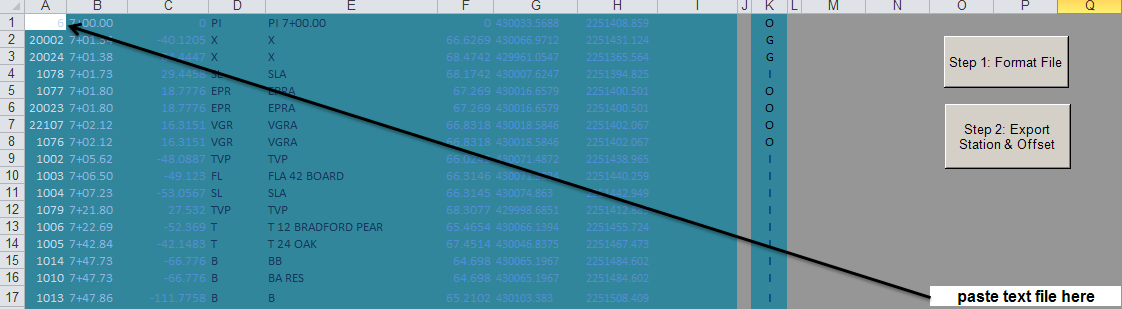
The plain, comma delineated text files will be Copied and Pasted into the **SOF** Import sheet starting in the A1 cell. All text will appear light blue.



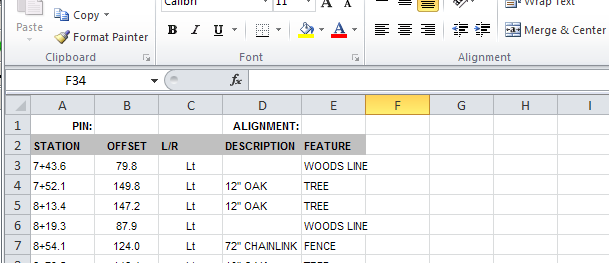
Select **Step 1: Format File** button on the right portion on the Import Worksheet. This will separate the text file into sortable cells which will be used in **Step 2**. Excel will ask if you want to replace the contents of the destination cells; click OK.



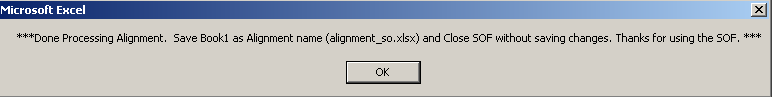
In Column K shows where the feature codes will be used in the program. Any fields showing #N/A means the feature code is either incorrect or possibly a recently added feature. Contact the **SOF** manager for updates to the **SOF** or assistance in trouble shooting this Feature field.



Now select the **Step 2: Export Station & Offset** button. A new Excel file will be created with 3 sheets. Sheet 1 will contain Station and Offsets Left of the Alignment, Sheet 2 will contain Station and Offset Right of the Alignment, and Sheet 3 will contain Station and Offset for Drainage features.

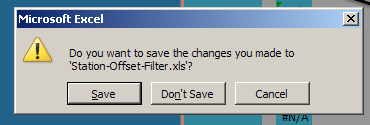


The SOF will display the following message when complete.



Save the newly create excel file after the reference alignment, for example alignment\_so.xlsx (breezy\_so.xlsx).

After **Step 2** is complete, all imported data in the **SOF** will be erased. For multiple Station Offset file creations, **SOF** and all other excel files, must be closed and restarted for each new file.



Review the newly created Station Offset file for reasonable accuracies. If, in the Description column, a survey code is not translated from the abbreviated format, make note of the abbreviated codes and email the list to the **SOF** manager. The survey description database will be updated periodically or as needed.

The newly created Excel is ready to be saved and used at the user’s discretion. **Never save changes to the SOF when finished**. Any additional Descriptions can be added by contacting **SOF** manager Steven Bailey @ 737-2047 or [baileysc@scdot.org](mailto:baileysc@scdot.org).

# Survey Codes and Station Offset Inclusion

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Survey Code | Survey Item | Station Offset Info | Survey Code | Survey Item | Station Offset Info |
| AC | A/C UNIT | Included | DTR | DITCH LINE | Excluded |
| AGT | A/G TANK | Included | EP | EDGE PVMT | Excluded |
| B | BUILDING | Included | EPL | EDGE PVMT | Excluded |
| BDL | BERM DITCH | Included | EPP | ELEC PEDESTAL | Included |
| BDR | BERM DITCH | Included | EPR | EDGE PVMT | Excluded |
| BL | BREAKLINE | Excluded | ERL | EDGE OF DIRT ORAD | Excluded |
| BM | BENCH MARK | Excluded | ERR | EDGE OF DIRT ORAD | Excluded |
| BRC | CONC BRIDGE | Included | ETB | ELEC TRANS BOX | Included |
| BRW | WOOD BRIDGE | Included | F | FLOWER BED | Included |
| BS | BOTTOM SLOPE | Excluded | FH | FIRE HYDRANT | Included |
| BSW | EDGE OF SIDEWALK | Included | FL | FENCE | Included |
| C | COLUMN | Included | FLAG | FLAG POLE | Included |
| CAP | FILL CAP - U/G TANK | Included | FLT | FLOOD/GROUND LIGHT | Included |
| CBN | CATCH BASIN | Included in Drainage | FOL | FIBER OPTIC LINE | Included |
| CEM | CEMETERY | Included | FR | FENCE | Included |
| CFL | FACE OF CURB | Excluded | FSS | UNKNOWN | Excluded |
| CFR | FACE OF CURB | Excluded | GEO | GEODETIC SURVEY MARKER | Excluded |
| CL | FACE OF CURB | Excluded | GL | GAS LINE | Included |
| CLP | FACE OF CURB | Excluded | GLT | GAS TEST PNT | Included |
| CMT | CONC MONUMENT | Included | GM | GAS METER | Included |
| CNP | CANOPY | Included | GMH | GAS MAN HOLE | Included |
| CP | SURVEY CONTROL | Excluded | GP | GUY POLE | Included |
| CPD | CONC PAD | Included | GPI | GAS PUMP ISLAND | Included |
| CRL | CREEK BANK | Excluded | GR | GUARD RAIL | Included |
| CRR | CREEK BANK | Excluded | GRV | GRAVE | Included |
| CRW | ROADWAY CROWN | Excluded | GV | GAS VALVE | Included |
| CVL | CULVERT | Included in Drainage | GW | GUY WIRE | Included |
| D | DIRT DRIVEWAY | Excluded | H | HEDGE ROW | Included |
| DAM | DAM | Included | HW | HEADWALL | Included |
| DAM1 | DAM | Included | ICL | INTERSECTION CENTERLINE | Excluded |
| DC | CONC DRIVEWAY | Included | IP | PROPERTY CORNER | Included |
| DC | CONC DRIVEWAY | Included | JB | JUNCTION BOX | Included in Drainage |
| DCR | CONC DRIVEWAY | Included | LC | UNKOWN LINE | Included |
| DF | DRAIN FIELD | Included | LP | LIGHT POLE | Included |
| DI | DROP INLET | Included in Drainage | MAR | MARSH LINE | Included |
| DP | ASPHALT DRIVEWAY | Included | MCL | MISC CURB | Excluded |
| DTL | DITCH LINE | Excluded | MCR | MISC CURB | Excluded |

## Survey Codes and Station Offset Inclusion (cont)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Survey Item | Station Offset Info | Survey Code | Survey Item | Station Offset Info |
| CONC MEDIAN | Excluded | RRM | RAILROAD MILE POST | Included |
| DRAIN MH | Included in Drainage | RRS | RAILROAD SIGNAL | Included |
| SEWER MH | Included | RRT | RAILROAD TRESTLE | Excluded |
| UITLITY MH | Included | RRX | RAILROAD CROSSING ARM | Included |
| SERVICE / METER POLE | Included | RSB | RAILROAD SIGNAL BOX | Included |
| MISC LINE | Included | RWE | EXISTING R/W | Included |
| MISC PNT | Included | RWM | R/W MONUMENT | Included |
| NO FEATURE | Excluded | S | SHRUB | Included |
| OUTFALL DRAIN LINE | Excluded | SAR | UNKNOWN | Excluded |
| OUTFALL DRAIN LINE | Excluded | SAT | SATELLITE DISH | Included |
| ORCHARD TREE | Included | SL | SHRUB ROW | Included |
| ORCHARD TREE LINE | Included | SN | SIGN | Included |
| ORCHARD TREE LINE | Included | SP | SIGN POST | Included |
| STORM PIPE | Included in Drainage | SPG | WATER SPIGET | Included |
| PNT OF CURVE | Excluded | SPK | SPRINKLER | Included |
| PNT OF CURVE | Excluded | SPL | SERVICE/METER POLE | Included |
| PNT OF COMPOUND CURVE | Excluded | SPR | SPRING | Included |
| PNT OF COMPOUND CURVE | Excluded | SS | SANITARY SEWER | Included |
| PNT OF INTERSECTION | Excluded | SSC | SEWER CLEANOUT | Included |
| PNT OF INTERSECTION | Excluded | ST | SEPTIC TANK | Included |
| PK NAIL | Excluded | STP | STEPS | Included |
| PROPERTY LINE (ON LINE) | Excluded | SVC | UNKNOWN | Excluded |
| CALC PROPERTY CORNER | Included | SW | SIDEWALK TO THE ROAD | Included |
| PLANTER | Included | SWL | SIDEWALK | Included |
| PNT ON CURVE | Excluded | SWP | SWAMP LINE | Included |
| PNT OF SUB-TANGENT | Excluded | SWR | SIDEWALK | Included |
| PNT ON TANGET | Excluded | T | TREE | Included |
| PNT ON TANGET | Excluded | TBX | TEL BOX | Included |
| P.POLE | Included | TC | TOP OF CURB | Excluded |
| PNT OF REVERSE CURVE | Excluded | TCW | TOWER (RADIO/TV) | Included |
| PNT OF REVERSE CURVE | Excluded | TG | TELEGRAPH POLE | Included |
| PNT OF TANGET | Excluded | THH | TEL HAND HOLE | Included |
| PNT OF TANGET | Excluded | TIE | CONTROL TIE | Excluded |
| RAD PNT | Excluded | TL | WOODS LINE | Included |
| RAD PNT | Excluded | TL1 | WOODS LINE | Included |
| RAILROAD TRACK | Excluded | TP | T.POLE | Included |
| RAILROAD TRACK | Excluded | TPP | T. PEDESTAL | Included |

## Survey Codes and Station Offset Inclusion (cont)

|  |  |  |
| --- | --- | --- |
| Survey Code | Survey Item | Station Offset Info |
| TR | WOODS LINE | Included |
| TS | TOP OF SLOPE | Excluded |
| TSJ | UNKNOWN | Excluded |
| TSP | TSP | Included |
| TVP | CTV PEDESTAL | Included |
| TW | COMMERCIAL TOWER PERIMETER | Included |
| UGC | U/G CABLE | Included |
| UGT | U/G TANK | Included |
| VGL | VALLEY GUTTER | Excluded |
| VGR | VALLEY GUTTER | Excluded |
| VOID | VOID SHOT | Excluded |
| W | WALL | Included |
| WE | EDGE OF WATER | Included |
| WEL | WELL | Included |
| WET | WETLAND | Included |
| WH | HIGH WATER MARK | Included |
| WL | WATER LINE | Included |
| WM | WATER METER | Included |
| WMH | WATER MAN HOLE | Included |
| WMW | WATER MONITORING WELL | Included |
| WTS | WITNESS MARKER | Included |
| WV | WATER VALVE | Included |
| WW | WINGWALL | Included |
| X | SPOT ELEVATION | Excluded |
| XL | SPOT ELEVATION | Excluded |
| XP | SPOT ELEVATION | Excluded |
| XR | SPOT ELEVATION | Excluded |
| DEFAULT | DEFAULT | Excluded |