

ACCURACY CONTROL: SURVEY REPORT MANUAL

Landeros, Jose



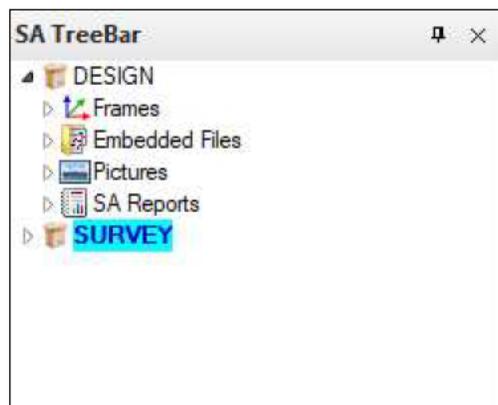
Contents

1. SETTING-UP	2
<i>a. Starting a new Spatial Analyzer file.</i>	2
<i>b. Import the necessary files.</i>	2
<i>c. Cleaning up the file.</i>	3
2. CREATING WORKING NOMINALS LIST FROM COMPLETE NOMINALS	4
<i>a. Look over the existing points and make sure all needed nominals are available.</i>	4
<i>b. Create points manually if needed.</i>	4
<i>c. Running the “Make working nominals list” MP</i>	5
<i>d. Delete all other point groups in the file except for the Working Nominals</i>	7
3. CREATING THE SURVEY REFERENCE SHEET.	7
<i>a. The Survey Reference Sheet will be used on the field as a guideline for naming the points. It should look something like the image below.</i>	7
<i>b. Making the callouts to label the points</i>	8
<i>c. Taking the pictures for the unit and callouts and paste on the Survey Ref Sheet template.</i>	9
<i>d. Change the name of the unit in the text box at the top of the document and save as the unit’s name under the appropriate folder in the N:\ drive</i>	10
4. SURVEYING	10
<i>a. Steps and things to keep in mind when surveying.</i>	10
<i>b. Using the MS60 for surveying.</i>	11
<i>c. Using the SA and laptop for surveying.</i>	11
5. ALIGNMENT	11
<i>a. Import the Survey ASCII file</i>	11
<i>b. Edit the Working Nominals Point list to match the Survey points list</i>	11
<i>c. Running the “point to point relationship fit” MP</i>	12
6. CALLOUTS AND REPORTING	17
<i>a. Creating the Callouts</i>	17
<i>b. Reporting</i>	19

1. Setting-up

a. Starting a new Spatial Analyzer file.

- i. Open a new SA file and save as
- ii. ["ship number" "name of unit" (Working)]
- iii. E.g. [REDACTED] (Working), [REDACTED] (Working)
- iv. Units settings should be in mm
- v. The file should only have two collections, DESIGN and SURVEY.
- vi. Both should be All-Caps.



b. Import the necessary files.

- i. Import the appropriate IGES file.

IGES files can be found at:



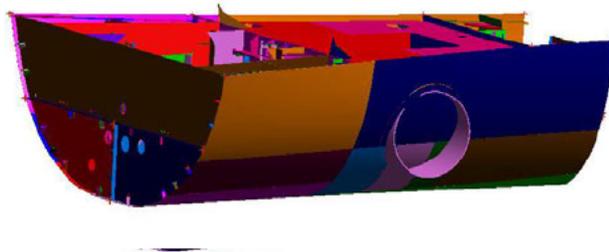
- ii. Import the appropriate COMPLETE NOMINALS list.

Nominals can be found at:



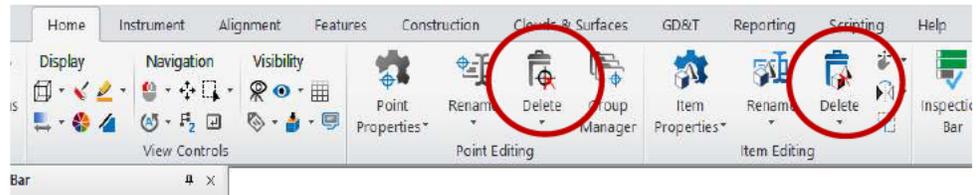
- iii. Make sure to only import excess nominals, when the excess on the unit is larger than 10mm.

- c. Cleaning up the file.



- i. Delete all unnecessary Points and items.
- ii. Only keep the surfaces and Complete Nominal points related to the project.

- iii. Use the delete option under Point Editing and Item Editing on the Home Tab in SA.



- iv. Individual points can only be deleted through the Point Editing Delete button, Item Editing Delete will delete any other objects and full Point Groups.

2. Creating Working Nominals list from Complete Nominals

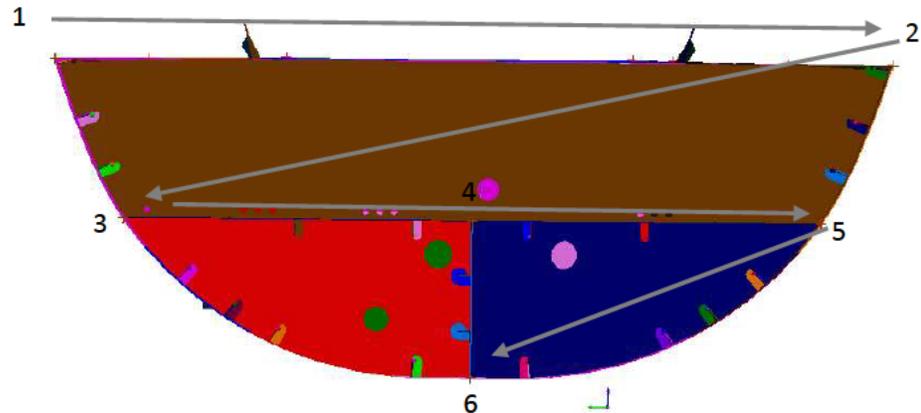
- a. Look over the existing points and make sure all needed nominals are available.
- b. Create points manually if needed.
 - i. Make sure the points created are always on molding line to avoid confusion between team members.
 - ii. Use the “points on object vertex by clicking” command to easily create points on object corners.
 - iii. Use the “Build Manually” command to create a point using defined coordinates.

- iv. Those are the two easiest methods of creating points for the Working Nominals list, but don't feel limited to only those 2 methods. Use what works best for you.
- v. The point group and name of the points created are not important at this time, but try to avoid naming them "1, 2, 3, 4, etc."
- vi. Once finished, make sure all points needed are available.

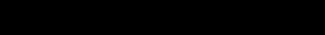
c. Running the "Make working nominals list" MP

- i. To run the MP directly from the N:\ drive, use the "Run MP Script" command under the Scripting Tab.
- ii. The location for the script is [REDACTED]
[REDACTED]
- iii. You can also embed the script onto the SA file using the "Embed Existing MP file" command under the Scripting Tab.
- iv. The first step will prompt you to type the unit you're working on and press OK.
(E.g. [REDACTED] Etc.)
- v. You then will be asked to "Select points in order (Enter when Done)". This is an important step and you will have to select all the points you want to use for the Working Nominals List.
- vi. The points will be numbered in the order of selection.

- vii. The standard is to start at the top left corner of either FWD or AFT side and work your way left to right then down in a Z pattern.



- viii. This will be the standard for Grand Blocks, but feel free to use a different pattern to adapt to the needs of different units, so long as they make it convenient for numbering and the movement of the person holding the target. (avoid an up and down zig-zag if it means the target holder will have to go up and down on a lift)
- ix. There will be times when multiple points appear in a specific area, be careful and make sure you select the correct one. Specific areas where this usually happens are bulkheads close to seams, and when two bulkheads line up on a deck.
- x. Once you're finished selecting the points, press Enter.

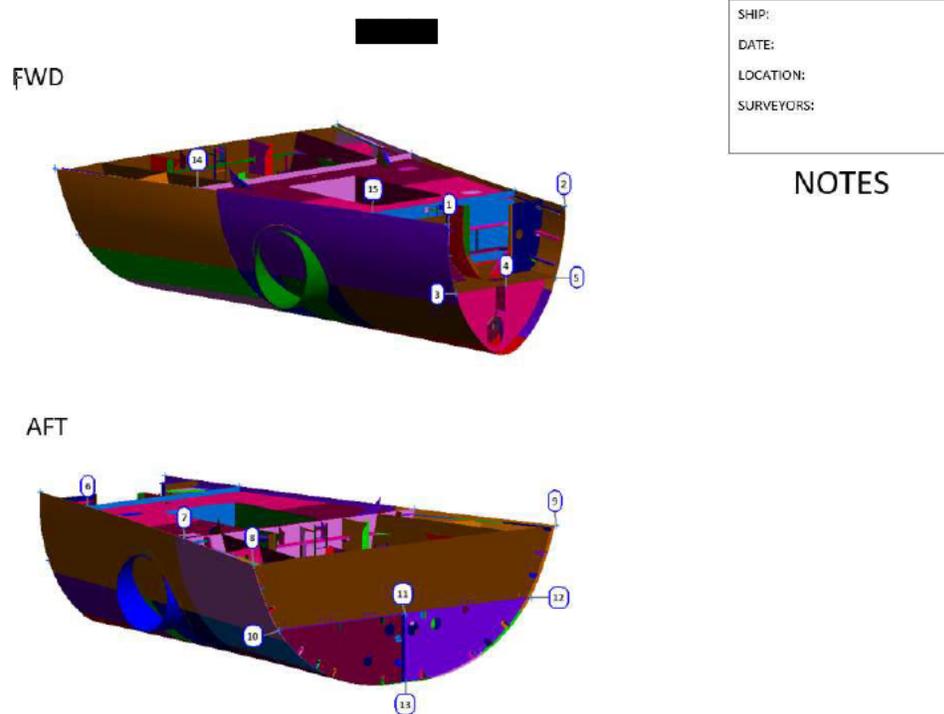
- xi. A point group should appear in the DESIGN collection with the name of the unit followed by Working Nominals. This is the point group we will be using for the project.
- xii. A dialogue box will pop-up asking if you would like to export the Working Nominals into an .txt file.
- xiii. If you click YES, a .txt document will be created in 

If you click NO, it will simply skip the export step.

- d. Delete all other point groups in the file except for the Working Nominals

3. Creating the Survey Reference Sheet.

- a. The Survey Reference Sheet will be used on the field as a guideline for naming the points. It should look something like the image below.



b. Making the callouts to label the points

- i. Position the unit in a way that you can fully see the AFT or FWD side and where you can see an outboard side as well if needed.
- ii. Go to the Reporting Tab and select "Point Label Callout" in the Callouts ribbon.
- iii. You can either individually select the points that stand in the "Front" side of the view and press Enter, or highlight all points and delete the unnecessary callouts afterwards.

- iv. A dialogue box will open up. Set it up as shown.

Point Label Callouts

Collection
 Group
 Target
 X
 Y
 Z
 Units

Offset from point to callout top-left corner

Horiz. Offset (pixels) 20
Vert. Offset (pixels) 30
 Use Default Placement

Coordinate System

Cartesian Cylindric Spherical

OK (keep callouts)
Cancel (delete callouts)

Apply

- v. Make sure the callout will remain legible when scaled down. The font size can be changed on the callout Properties.
- vi. Arrange the callouts in a neat and easy to read manner.
- vii. Repeat the process for the opposite side after taking the image.
- c. Taking the pictures for the unit and callouts and paste on the Survey Ref Sheet template.

- i. The location of the template is: [REDACTED]
- [REDACTED]
- ii. Using the Snipping Tool, crop out a picture of the view, making sure to capture all relevant information while being mindful of the image size.
- iii. Paste the image and place it according to the side in view. FWD on top and AFT on bottom.

- iv. scale to an appropriate size and arrange neatly to allow space for field notes.
- d. Change the name of the unit in the text box at the top of the document and save as the unit's name under the appropriate folder in the N:\ drive.

4. Surveying

- a. Things to keep in mind when surveying.
 - i. Check off the points from the Survey Reference Sheet, as they are being recorded.
 - ii. Keep track of all the offsets on the field notes portion of the Reference Sheet.
 - iii. At the end of the survey, cross out all points that were skipped.
 - iv. When skipping points during a survey, skip the name number and replace with the number marked in the Survey Reference Sheet.
 - v. All survey points within the Working Nominals list should be saved under the Point Group named "Survey".
 - vi. All additional points should go into separate Point Groups according to their purpose.
 - vii. **DO NOT SAVE ADDITIONAL POINTS UNDER THE "Survey" POINT GROUP.**

- b. Using the MS60 for surveying.
 - i. The Point Groups will be under “Code” in the MS60, make sure the survey points within the Working Nominals list are in the “Survey” Code.
 - ii. The point names will automatically be sorted numerically when exported into an ASCII file and imported into SA. Even when shot out of order.

- c. Using the SA and laptop for surveying.
 - i. The points will be saved in the order they were shot, so they may not be sorted numerically.
 - ii. To fix this, run the “*Sort point group by number*” MP located in:


5. Alignment

- a. Import the Survey ASCII file
 - i. Import the Survey ASCII file for the project into the “SURVEY” Collection of the existing SA file for the project.
 - ii. Select the appropriate ASCII import format.

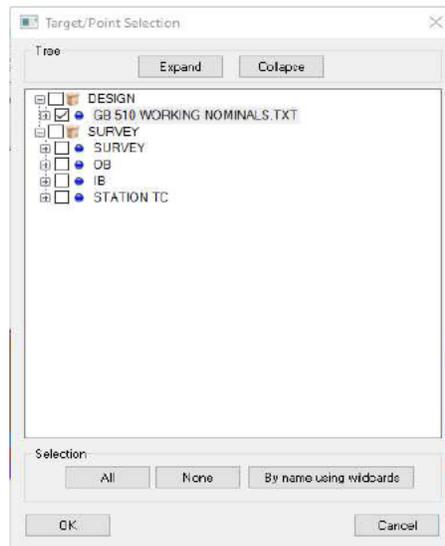
- b. Edit the Working Nominals Point list to match the Survey points list

- i. Make sure the Working Nominals point list has been extracted and saved in the Working Nominals folder. [REDACTED]
[REDACTED]
- ii. If not, export it manually before you continue.
- iii. On your Working Nominals list, delete all the points that were skipped during the survey. Use your Survey Reference Sheet as guide. (NOTE: You should only be deleting points on your Working Nominals; never on your Survey point group.)
- iv. ONLY DELETE THE POINTS THAT WERE SKIPPED!!!
- v. Review both, Working Nominals and Survey point lists. Make sure they have the exact same points in each one. Same number of points and same point names.

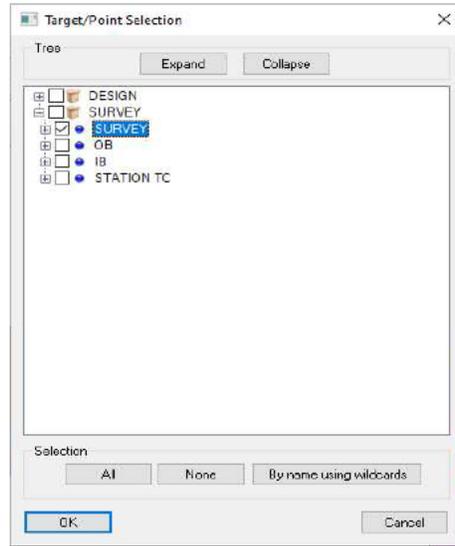
c. Running the “point to point relationship fit” MP

- i. Run “Point to point relationship fit.mp” located at:
[REDACTED]
- ii. It will ask you to “Select Nominal Point List”. For this step, press F2, and select your Working Nominals under the DESIGN Collection. Click OK then press Enter.

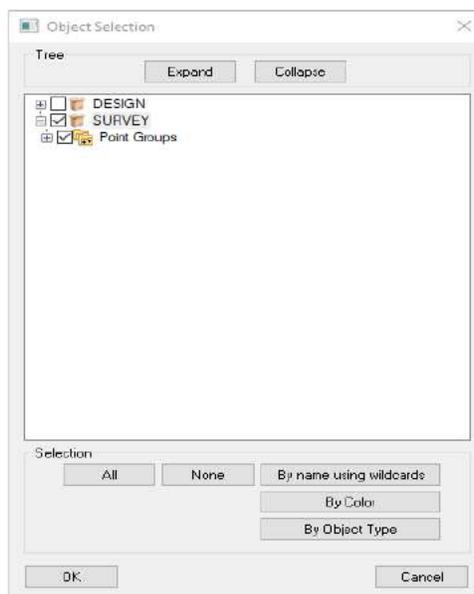
(You may need to expand the DESIGN Collection options to see the Working Nominals list.)



- iii. Next, it will ask you to “Select Survey Point List”. For this, again, press F2 and select only the Survey point group in the SURVEY Collection. Click OK then press Enter. (Make sure to not select the whole SURVEY Collection box. The point group should be right under it.)



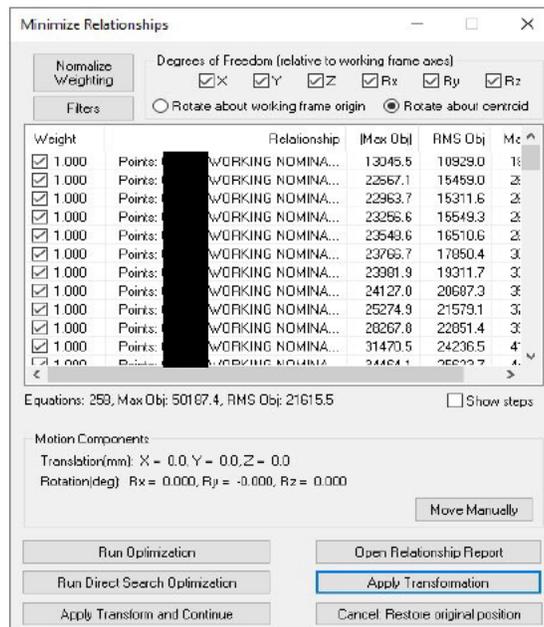
- iv. The MP will now create all the point to point relationships between the two points lists. This may take a couple of seconds.
- v. You will then need to select the “Objects to Move”



vi. When prompted, press F2 and check only the SURVEY Collection box. This will automatically add every item in the Collection.

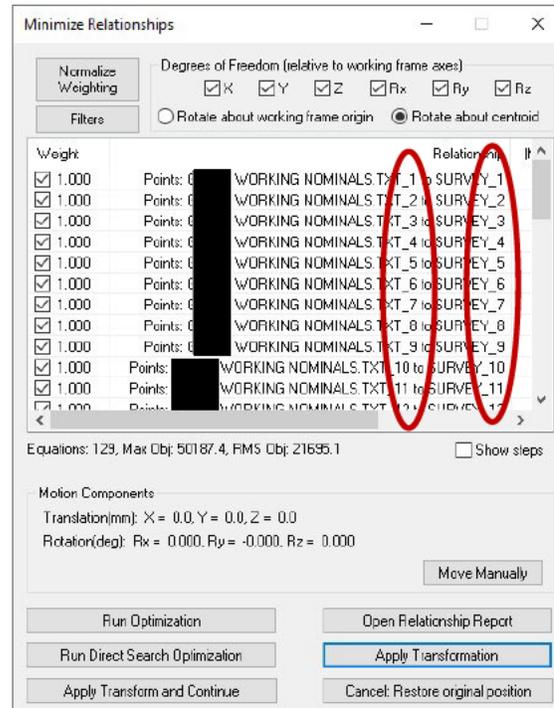
Click OK then press Enter.

vii. The Relationship Fit dialogue box should pop-up.



viii. Expand the Relationship column until you can read the name of the relationships completely.

- ix. Check that both numbers on the relationships match.



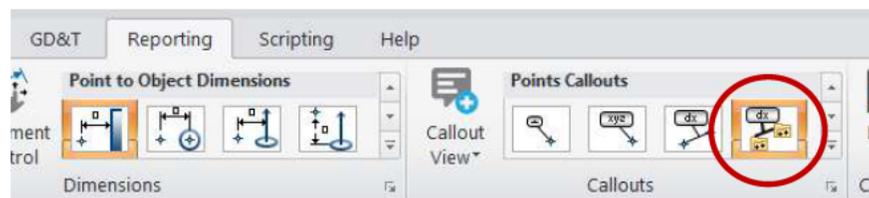
- x. If the numbers do not match, you must first click the Cancel option in the dialogue box, Exit the MP by clicking “Done” in the bottom left corner of your screen, and delete all the relationships created. Then you must edit the Working Nominals point list again until it matches the Survey Points list. Finally, you will have to run the Point to point relationship fit MP again.
- xi. If the numbers match, you must click to deselect the relationships with the points that are at loose ends, have offsets, and any points that could otherwise throw off the relationship.
- xii. Once only the points being used for the alignment are selected, click **Run Optimization**.

- xiii. Review the magnitude of discrepancies in the relationships, and adjust the points selected at your best judgment. (The goal is to deselect any points that may be bad or were missed, not to get all numbers closer to 0.)
- xiv. When you are satisfied with the results, click the option to Apply Transformation. (This step cannot be undone. Make sure everything is to your satisfaction before applying.)

6. Callouts and Reporting

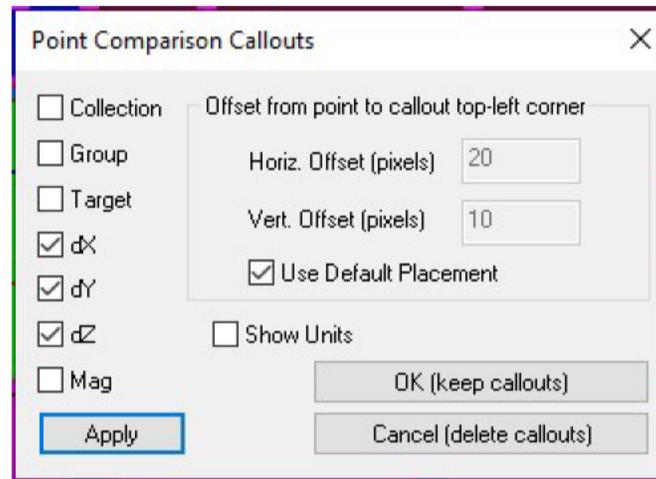
a. Creating the Callouts

- i. Under the Reporting Tab, click on Group Comparison Callout in the Callouts ribbon.

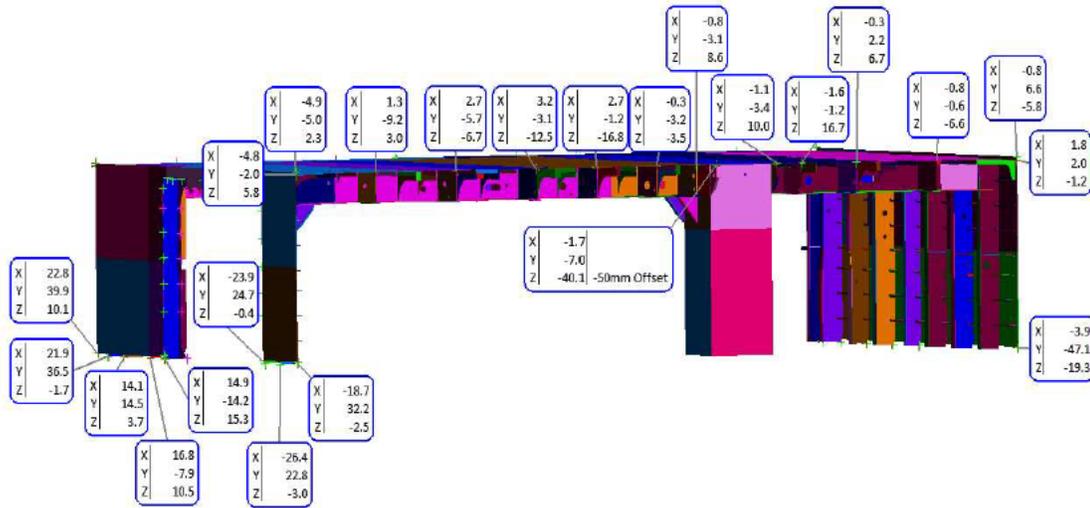


- ii. It will ask you to “Select Begin Group”. This will always be your Working Nominals. Double click on it.
- iii. Next you will be asked to “Select Ending Group”. This will always be your Survey point Group. Double click it.

- iv. A Point Comparison Callouts dialogue box will open.



- v. Make sure it matches the one above the click OK. (Target is optional)
- vi. Make a copy of the Callout that was created and name it AFT SIDE.
- vii. Rename the original Callout to FWD SIDE.
- viii. For the FWD SIDE Callout, you will begin by deleting all Callouts on the AFT side of the unit. Hold down Ctrl and click on all the desired Callouts then right-click and delete. (The Delete key will not work)
- ix. Position the Unit in a way as to see the full FWD side and an outboard side if needed.
- x. Delete any other callouts that are not in the "Front" view of the unit.
- xi. Arrange callouts in a way that's neat and easy to understand.
- xii. Make sure all leaders are clear of the position of the point being reported.



- xiii. Add a comment with the offsets to all points that have one on the right value.
- xiv. To edit the properties or add comments to the callout, simply right click on the callout and select Callout Properties.
- xv. To edit the font and box, select Callout Styling.
- xvi. Lock viewport.
- xvii. Repeat the process with the AFT SIDE.

b. Reporting

- i. Making the Report
- ii. Take an Accuracy Control Report template Excel file and fill out the required information.
- iii. Copy the format of the whole first page once the info has been filled out.
- iv. Paste as many pages as needed for the report.

- v. Using the Snipping Tool get a picture of the callout view and place it in the report, starting on the second page.
 - i. Fill out any additional information as needed.
 - ii. Make sure the pages are formatted right
 - iii. Make the excel file into a PDF and save to the appropriate folder in N:\ drive.

