Jefferson Lab Alignment Group

Data Transmittal

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DETAILS: DATA : calcs\hallc\qweak\qtor\fiducial calcs & data\fiduc\hallc\qweak\various…

The alignment group surveyed the QTor coils at Jefferson Lab after they arrived from MIT Bates. The reason for this survey was to check whether the coils had moved relative to the carrier assembly. Additiional targets were also added, which will be used during the assembly in Hall C. Unfortunately, many of the targets which were glued on the coils (points CID, CIU, COD, COU) were lost during the transportation from Bates.

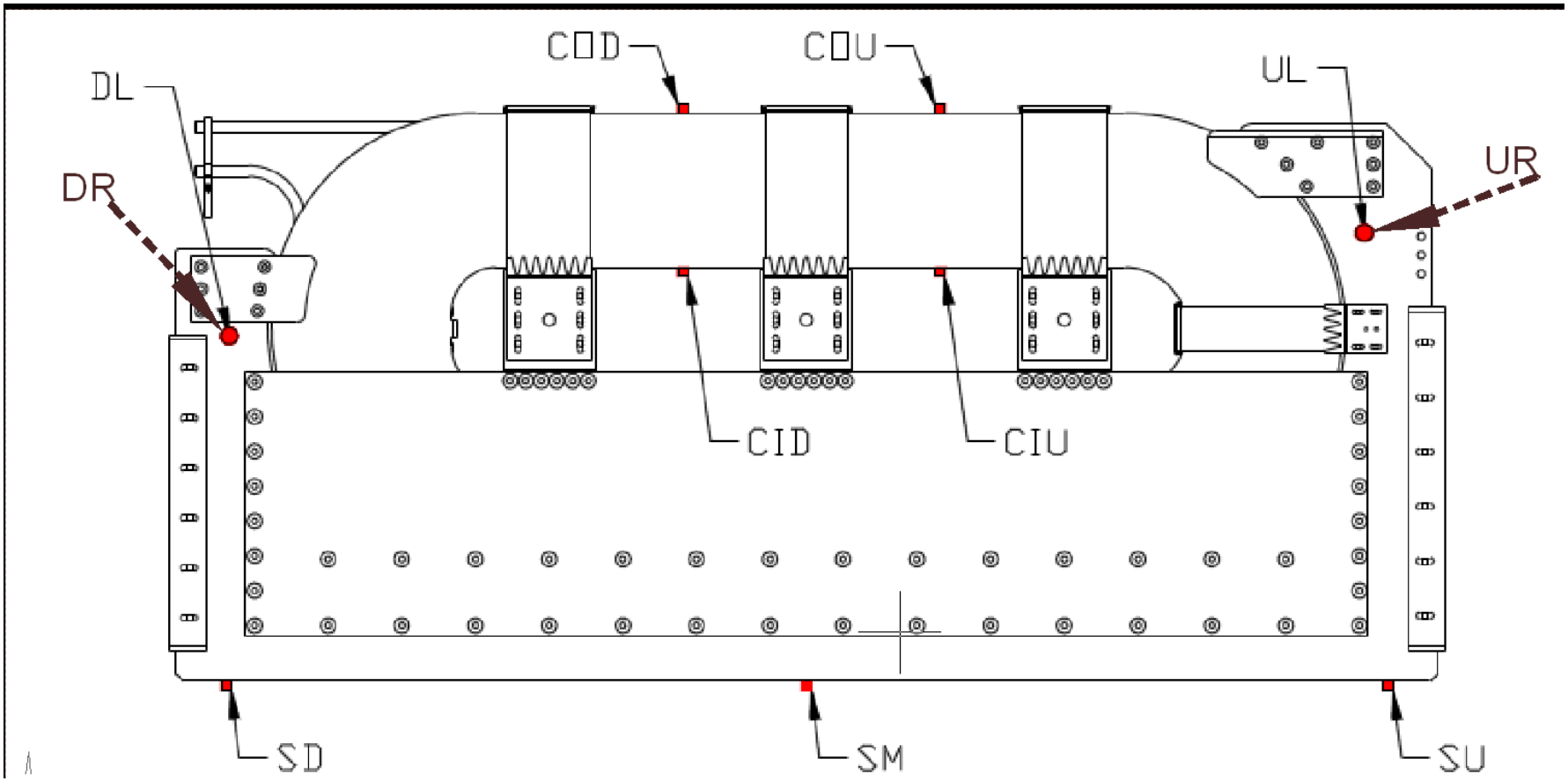
The table below has two sets of survey adjustments of the observations. During the survey, it was found that the 4 points which held the posts (refer to Qtor assembly manual) on the carrier sides (points UL, UR, DL, and DR) were poor fitting. The result was that the positions could not be repeated accurately during the surveys at Jefferson Lab and the standard deviation for these surveys was poor. For this reason, a second adjustment of the data was carried out. In the second adjustment (float posts), the posts were not held as fixed objects in the least squares adjustments. A best adjustment occurs when the standard deviation is closest to 1.00.

After the survey data adjustment, the data was then least squared transformed to the coordinates that Bates lab had established. The “fit” of the data is shown, again with 2 adjustments being carried out. The first set of data holds all the values “fixed”. The second adjustment allows post and coil data to float.

The floated data values were then used to compare the coordinates on the coils to the Bates values. Differences (rms values) are shown in millimeters.

Note not all of the coils had points remaining after transportation.

	Survey Adjustments (3dcd)		Fitting (Ninepar) mm		RMS Errors (mm)			
Coil	Survey std. deviation	Float "posts" Std.Dev.	Standard results	floated results	Coil Pt CID	Coil Pt CIU	Coil Pt COD	Coil Pt COU
2	1.57	0.98	1.26	0.36	0.26	0.56		0.50
3	1.45	1.00	0.80	0.61	0.45	0.31		
4	0.91	0.91	1.49	0.67				
5	1.03	1.03	0.97	0.30	0.18	0.29	0.79	0.72
6	1.24	0.94	0.80	0.36	0.20		0.73	
7	1.54	1.07	1.18	0.41				0.46
8	1.31	1.01	0.59	0.30	0.25		0.84	0.87
9	1.14	1.01	1.33	0.38	1.15			


COD
COU
DL
UL
DR
UR
CID
CIU
SD
SM
SU