

**TEST STAND #2** Survey performed on 2-8-2024 with FARO

**ALIGNMENT 1** FARO alignment: BTVE-1 as sphere; PSI-1, PSI-2, PSI-6 as points; alignment created on 2/5/2024

designation	Designed Test Stand Local		Measured LVEA Local, FARO		Measured Test Stand Local		Difference	
	X (mm)	Y (mm)	X (mm)	Y (mm)	X (mm)	Y (mm)	$\Delta X$ (mm)	$\Delta Y$ (mm)
TS2-1	-200.0	5133.0	5652.1	43445.1	-208.0	5132.7	-8.0	-0.3
TS2-2	0.0	5133.0	5853.1	43444.3	-7.0	5131.9	-7.0	-1.1
TS2-3	200.0	5133.0	6051.8	43445.7	191.7	5133.3	-8.3	0.3
TS2-4	-200.0	-7570.0	5670.7	30740.5	-189.4	-7571.9	10.6	-1.9
TS2-5	0.0	-7570.0	5872.0	30740.5	11.9	-7571.9	11.9	-1.9
TS2-6	200.0	-7570.0	6071.0	30740.9	210.9	-7571.5	10.9	-1.5
TS2-7	-200.0	2800.0	5656.0	41111.0	-204.1	2798.6	-4.1	-1.4
TS2-8	3327.3	2800.0	9183.1	41116.0	3323.0	2803.6	-4.3	3.6
TS2-10	0.0	0.0	5860.1	38312.4	0.0	0.0	0.0	0.0
TS2-11	-2872.0	200.0	2988.1	38508.6	-2872.0	196.2	0.0	-3.8
TS2-12	-2872.0	0.0	2988.1	38308.1	-2872.0	-4.3	0.0	-4.3
TS2-15	7285.0	200.0	13149.3	38523.1	7289.2	210.7	4.2	10.7
TS2-16	7285.0	0.0	13151.3	38323.4	7291.2	11.0	6.2	11.0
TS2-17	7285.0	-200.0	13149.5	38122.7	7289.4	-189.7	4.4	10.3
TS2-18	-2872.0	-2475.7	2992.2	35832.5	-2867.9	-2479.9	4.1	-4.2
TS2-19	0.0	6540.7	5850.3	44852.1	-9.8	6539.7	-9.8	-1.0
TS2-20	5594.5	6540.7	11443.6	44860.7	5583.5	6548.3	-11.0	7.6
TS2-24	-183.9	0.0	5676.0	38312.0	-184.1	-0.4	-0.2	-0.4

**TEST STAND #2** Survey performed on 2-16-2024 with FARO

**ALIGNMENT 2** FARO alignment: BTVE-1, PSI-1, PSI-2, PSI-6 as spheres; alignment created on 1/22/2024

designation	Designed Test Stand Local		Measured LVEA Local, FARO		Measured Test Stand Local		Difference	
	X (mm)	Y (mm)	X (mm)	Y (mm)	X (mm)	Y (mm)	$\Delta X$ (mm)	$\Delta Y$ (mm)
TS2-1	-200.0	5133.0	5652.1	43444.5	-208.1	5132.6	-8.1	-0.4
TS2-2	0.0	5133.0	5853.1	43443.7	-7.1	5131.8	-7.1	-1.2
TS2-3	200.0	5133.0	6051.8	43445.1	191.6	5133.2	-8.4	0.2
TS2-4	-200.0	-7570.0	5670.9	30740.1	-189.3	-7571.8	10.7	-1.8
TS2-5	0.0	-7570.0	5872.0	30740.1	11.8	-7571.8	11.8	-1.8
TS2-6	200.0	-7570.0	6071.2	30740.5	211.0	-7571.4	11.0	-1.4
TS2-7	-200.0	2800.0	5656.1	41110.4	-204.1	2798.5	-4.1	-1.5
TS2-8	3327.3	2800.0	9183.2	41115.5	3323.0	2803.6	-4.3	3.6
TS2-10	0.0	0.0	5860.2	38311.9	0.0	0.0	0.0	0.0
TS2-11	-2872.0	200.0	2988.2	38508.1	-2872.0	196.2	0.0	-3.8
TS2-12	-2872.0	0.0	2988.3	38307.6	-2871.9	-4.3	0.1	-4.3
TS2-15	7285.0	200.0	13149.4	38522.7	7289.2	210.8	4.2	10.8
TS2-16	7285.0	0.0	13151.2	38322.9	7291.0	11.0	6.0	11.0
TS2-17	7285.0	-200.0	13149.5	38122.2	7289.3	-189.7	4.3	10.3
TS2-18	-2872.0	-2475.7	2992.3	35832.0	-2867.9	-2479.9	4.1	-4.2
TS2-19	0.0	6540.7	5850.3	44851.6	-9.9	6539.7	-9.9	-1.0
TS2-20	5594.5	6540.7	11443.6	44860.1	5583.4	6548.2	-11.1	7.5
TS2-24	-183.9	0.0	5676.1	38311.5	-184.1	-0.4	-0.2	-0.4

**TEST STAND #2** Survey performed on 2-21-2024 with FARO

**ALIGNMENT 3** FARO alignment: BTVE-1, PSI-1, PSI-2, PSI-6 as spheres; alignment created on 2/21/2024, new for this survey

designation	Designed Test Stand Local		Measured LVEA Local, FARO		Measured Test Stand Local		Difference	
	X (mm)	Y (mm)	X (mm)	Y (mm)	X (mm)	Y (mm)	$\Delta X$ (mm)	$\Delta Y$ (mm)
TS2-1	-200.0	5133.0	5652.1	43444.8	-207.9	5132.7	-7.9	-0.3
TS2-2	0.0	5133.0	5853.1	43444.0	-6.9	5131.9	-6.9	-1.1
TS2-3	200.0	5133.0	6051.5	43445.5	191.5	5133.4	-8.5	0.4
TS2-4	-200.0	-7570.0	5670.3	30740.2	-189.7	-7571.9	10.3	-1.9
TS2-5	0.0	-7570.0	5871.3	30740.2	11.3	-7571.9	11.3	-1.9
TS2-6	200.0	-7570.0	6070.4	30740.5	210.4	-7571.6	10.4	-1.6
TS2-7	-200.0	2800.0	5656.0	41110.6	-204.0	2798.5	-4.0	-1.5
TS2-8	3327.3	2800.0	9183.2	41115.6	3323.2	2803.5	-4.1	3.5
TS2-10	0.0	0.0	5860.0	38312.1	0.0	0.0	0.0	0.0
TS2-11	-2872.0	200.0	2987.8	38508.4	-2872.2	196.3	-0.2	-3.7
TS2-12	-2872.0	0.0	2987.9	38307.9	-2872.1	-4.2	-0.1	-4.2
TS2-13	-2872.0	-200.0	2989.2	38108.8	-2870.8	-203.3	1.2	-3.3
TS2-15	7285.0	200.0	13149.1	38522.4	7289.1	210.3	4.1	10.3
TS2-16	7285.0	0.0	13151.1	38322.5	7291.1	10.4	6.1	10.4
TS2-17	7285.0	-200.0	13149.3	38121.9	7289.3	-190.2	4.3	9.8
TS2-18	-2872.0	-2475.7	2991.8	35832.4	-2868.2	-2479.7	3.8	-4.0
TS2-19	0.0	6540.7	5850.4	44851.9	-9.6	6539.8	-9.6	-0.9
TS2-20	5594.5	6540.7	11443.8	44860.1	5583.8	6548.0	-10.7	7.3
TS2-24	-183.9	0.0	5675.9	38311.6	-184.1	-0.5	-0.2	-0.5

TEST STAND #2 ALIGNMENT COMPARISONS

designation	Measured LVEA Local, Alignment 1 vs Alignment 2				Measured Test Stand Local, Alignment 1 vs Alignment 2							
	Measured LVEA Local FARO Alignment 1		Measured LVEA Local FARO Alignment 2		Difference		Measured Test Stand Local FARO Alignment 1		Measured Test Stand Local FARO Alignment 2		Difference	
	X (mm)	Y (mm)	X (mm)	Y (mm)	ΔX (mm)	ΔY (mm)	X (mm)	Y (mm)	X (mm)	Y (mm)	ΔX (mm)	ΔY (mm)
TS2-1	5652.1	43445.1	5652.1	43444.5	0.0	-0.6	-208.0	5132.7	-208.1	5132.6	-0.1	-0.1
TS2-2	5853.1	43444.3	5853.1	43443.7	0.0	-0.6	-7.0	5131.9	-7.1	5131.8	-0.1	-0.1
TS2-3	6051.8	43445.7	6051.8	43445.1	0.0	-0.6	191.7	5133.3	191.6	5133.2	-0.1	-0.1
TS2-4	5670.7	30740.5	5670.9	30740.1	0.2	-0.4	-189.4	-7571.9	-189.3	-7571.8	0.1	0.1
TS2-5	5872.0	30740.5	5872.0	30740.1	0.0	-0.4	11.9	-7571.9	11.8	-7571.8	-0.1	0.1
TS2-6	6071.0	30740.9	6071.2	30740.5	0.2	-0.4	210.9	-7571.5	211.0	-7571.4	0.1	0.1
TS2-7	5656.0	41111.0	5656.1	41110.4	0.1	-0.6	-204.1	2798.6	-204.1	2798.5	0.0	-0.1
TS2-8	9183.1	41116.0	9183.2	41115.5	0.1	-0.5	3323.0	2803.6	3323.0	2803.6	0.0	0.0
TS2-10	5860.1	38312.4	5860.2	38311.9	0.1	-0.5	0.0	0.0	0.0	0.0	0.0	0.0
TS2-11	2988.1	38508.6	2988.2	38508.1	0.1	-0.5	-2872.0	196.2	-2872.0	196.2	0.0	0.0
TS2-12	2988.1	38308.1	2988.3	38307.6	0.2	-0.5	-2872.0	-4.3	-2871.9	-4.3	0.1	0.0
TS2-15	13149.3	38523.1	13149.4	38522.7	0.1	-0.4	7289.2	210.7	7289.2	210.8	0.0	0.1
TS2-16	13151.3	38323.4	13151.2	38322.9	-0.1	-0.5	7291.2	11.0	7291.0	11.0	-0.2	0.0
TS2-17	13149.5	38122.7	13149.5	38122.2	0.0	-0.5	7289.4	-189.7	7289.3	-189.7	-0.1	0.0
TS2-18	2992.2	35832.5	2992.3	35832.0	0.1	-0.5	-2867.9	-2479.9	-2867.9	-2479.9	0.0	0.0
TS2-19	5850.3	44852.1	5850.3	44851.6	0.0	-0.5	-9.8	6539.7	-9.9	6539.7	-0.1	0.0
TS2-20	11443.6	44860.7	11443.6	44860.1	0.0	-0.6	5583.5	6548.3	5583.4	6548.2	-0.1	-0.1
TS2-24	5676.0	38312.0	5676.1	38311.5	0.1	-0.5	-184.1	-0.4	-184.1	-0.4	0.0	0.0

designation	Measured LVEA Local, Alignment 2 vs Alignment 3				Measured Test Stand Local, Alignment 2 vs Alignment 3							
	Measured LVEA Local FARO Alignment 2		Measured LVEA Local FARO Alignment 3		Difference		Measured Test Stand Local FARO Alignment 2		Measured Test Stand Local FARO Alignment 3		Difference	
	X (mm)	Y (mm)	X (mm)	Y (mm)	ΔX (mm)	ΔY (mm)	X (mm)	Y (mm)	X (mm)	Y (mm)	ΔX (mm)	ΔY (mm)
TS2-1	5652.1	43444.5	5652.1	43444.8	0.0	0.3	-208.1	5132.6	-207.9	5132.7	0.2	0.1
TS2-2	5853.1	43443.7	5853.1	43444.0	0.0	0.3	-7.1	5131.8	-6.9	5131.9	0.2	0.1
TS2-3	6051.8	43445.7	6051.5	43445.5	-0.3	0.4	191.6	5133.2	191.5	5133.4	-0.1	0.2
TS2-4	5670.7	30740.1	5670.3	30740.2	-0.6	0.1	-189.3	-7571.8	-189.7	-7571.9	-0.4	-0.1
TS2-5	5872.0	30740.1	5871.3	30740.2	-0.7	0.1	11.8	-7571.8	11.3	-7571.9	-0.5	-0.1
TS2-6	6071.0	30740.5	6070.4	30740.5	-0.8	0.0	211.0	-7571.4	210.4	-7571.6	-0.6	-0.2
TS2-7	5656.1	41110.4	5656.0	41110.6	-0.1	0.2	-204.1	2798.5	-204.0	2798.5	0.1	0.0
TS2-8	9183.2	41115.5	9183.2	41115.6	0.0	0.1	3323.0	2803.6	3323.2	2803.5	0.2	-0.1
TS2-10	5860.2	38311.9	5860.0	38312.1	-0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
TS2-11	2988.2	38508.1	2987.8	38508.4	-0.4	0.3	-2872.0	196.2	-2872.2	196.3	-0.2	0.1
TS2-12	2988.3	38307.6	2987.9	38307.9	-0.4	0.3	-2871.9	-4.3	-2872.1	-4.2	-0.2	0.1
TS2-15	13149.4	38522.7	13149.1	38522.4	-0.3	-0.3	7289.2	210.8	7289.1	210.3	-0.1	-0.5
TS2-16	13151.2	38322.9	13151.1	38322.5	-0.1	-0.4	7291.0	11.0	7291.1	10.4	0.1	-0.6
TS2-17	13149.5	38122.2	13149.3	38121.9	-0.2	-0.3	7289.3	-189.7	7289.3	-190.2	0.0	-0.5
TS2-18	2992.2	35832.0	2991.8	35832.4	-0.5	0.4	-2867.9	-2479.9	-2868.2	-2479.7	-0.3	0.2
TS2-19	5850.3	44851.6	5850.4	44851.9	0.1	0.3	-9.9	6539.7	-9.6	6539.8	0.3	0.1
TS2-20	11443.6	44860.1	11443.8	44860.1	0.2	0.0	5583.4	6548.2	5583.8	6548	0.4	-0.2
TS2-24	5676.1	38311.5	5675.9	38311.6	-0.2	0.1	-184.1	-0.4	-184.1	-0.5	0.0	-0.1

designation	Measured LVEA Local, Alignment 1 vs Alignment 3				Measured Test Stand Local, Alignment 1 vs Alignment 3							
	Measured LVEA Local FARO Alignment 1		Measured LVEA Local FARO Alignment 3		Difference		Measured Test Stand Local FARO Alignment 1		Measured Test Stand Local FARO Alignment 3		Difference	
	X (mm)	Y (mm)	X (mm)	Y (mm)	ΔX (mm)	ΔY (mm)	X (mm)	Y (mm)	X (mm)	Y (mm)	ΔX (mm)	ΔY (mm)
TS2-1	5652.1	43445.1	5652.1	43444.8	0.0	-0.3	-208.0	5132.7	-207.9	5132.7	0.1	0.0
TS2-2	5853.1	43444.3	5853.1	43444.0	0.0	-0.3	-7.0	5131.9	-6.9	5131.9	0.1	0.0
TS2-3	6051.8	43445.7	6051.5	43445.5	-0.3	-0.2	191.7	5133.3	191.5	5133.4	-0.2	0.1
TS2-4	5670.7	30740.5	5670.3	30740.2	-0.4	-0.3	-189.4	-7571.9	-189.7	-7571.9	-0.3	0.0
TS2-5	5872.0	30740.5	5871.3	30740.2	-0.7	-0.3	11.9	-7571.9	11.3	-7571.9	-0.6	0.0
TS2-6	6071.0	30740.9	6070.4	30740.5	-0.6	-0.4	210.9	-7571.5	210.4	-7571.6	-0.5	-0.1
TS2-7	5656.0	41111.0	5656.0	41110.6	0.0	-0.4	-204.1	2798.6	-204.0	2798.5	0.1	-0.1
TS2-8	9183.1	41116.0	9183.2	41115.6	0.1	-0.4	3323.0	2803.6	3323.2	2803.5	0.2	-0.1
TS2-10	5860.1	38312.4	5860.0	38312.1	-0.1	-0.3	0.0	0.0	0.0	0.0	0.0	0.0
TS2-11	2988.1	38508.6	2987.8	38508.4	-0.3	-0.2	-2872.0	196.2	-2872.2	196.3	-0.2	0.1
TS2-12	2988.1	38308.1	2987.9	38307.9	-0.2	-0.2	-2872.0	-4.3	-2872.1	-4.2	-0.1	0.1
TS2-15	13149.3	38523.1	13149.1	38522.4	-0.2	-0.7	7289.2	210.7	7289.1	210.3	-0.1	-0.4
TS2-16	13151.3	38323.4	13151.1	38322.5	-0.2	-0.9	7291.2	11.0	7291.1	10.4	-0.1	-0.6
TS2-17	13149.5	38122.7	13149.3	38121.9	-0.2	-0.8	7289.4	-189.7	7289.3	-190.2	-0.1	-0.5
TS2-18	2992.2	35832.5	2991.8	35832.4	-0.4	-0.1	-2867.9	-2479.9	-2868.2	-2479.7	-0.3	0.2
TS2-19	5850.3	44852.1	5850.4	44851.9	0.1	-0.2	-9.8	6539.7	-9.6	6539.8	0.2	0.1
TS2-20	11443.6	44860.7	11443.8	44860.1	0.2	-0.6	5583.5	6548.3	5583.8	6548	0.3	-0.3
TS2-24	5676.0	38312.0	5675.9	38311.6	-0.1	-0.4	-184.1	-0.4	-184.1	-0.5	0.0	-0.1