Three-Dimensional Laser Scanner Field Evaluation

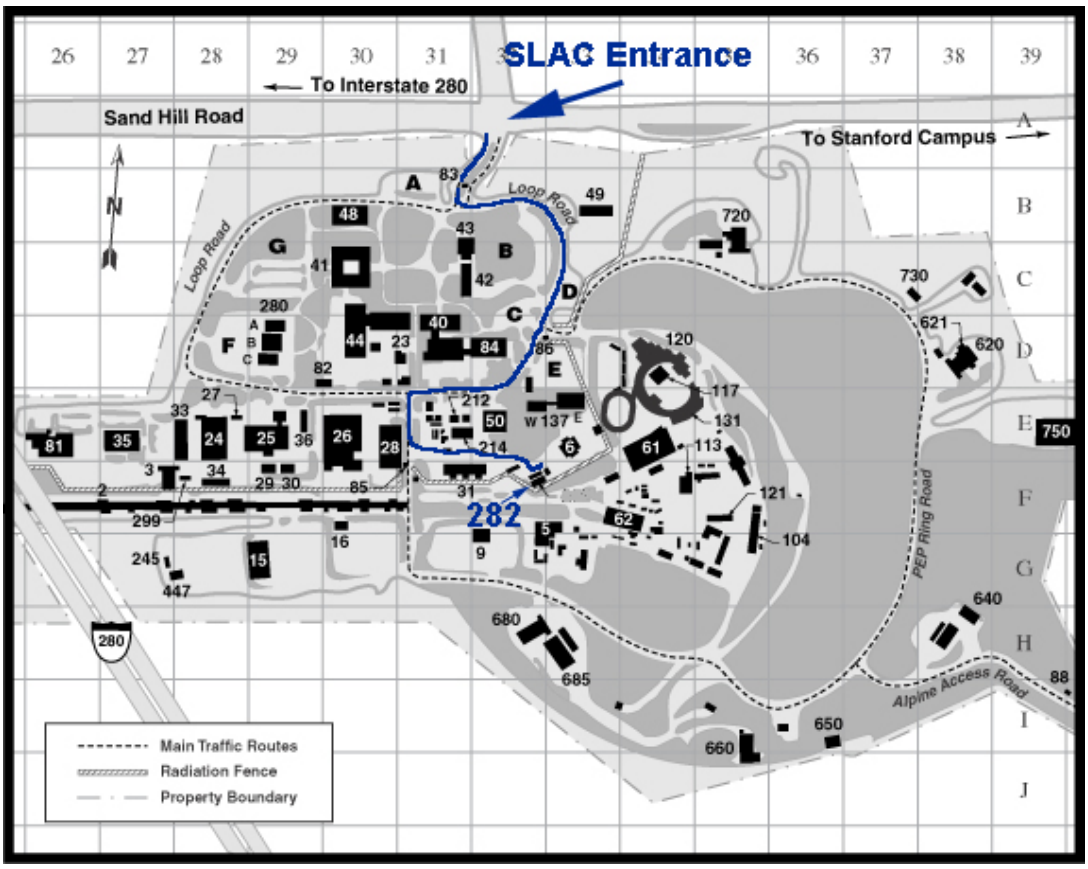
Laser Scanner Field Evaluation Schedule				
Date	Time	Test	Description	Location
Day 1	9:00 A.M	Short Introduction	Meeting and introduction between SLAC AEG personnel and vendor	Trailer 282, Room 2
	9:00 A.M. → 12:00 Noon	Test 1: Tunnel Test	Scanning beamline components and region	SLC, South Final Focus
	1:30 P.M. → 3:00 P.M.	Test 2: Building Test	Scan building and/or floor plan	TBA
	3:00 P.M. → 5:00 P.M.	Office Recap	Discussion of testing and results for day 1	Trailer 283, Conference Area
Day 2	8:00 A.M. → 10:00 A.M.	Test 3: Accuracy Test	Comparison of scanner with laser interferometer	Sector 10 Tape Bench Laboratory
	10:00 A.M. → 12:30 P.M.	Office Discussion	Final wrap-up and filing of data with discussion	Trailer 283, Conference Area

Available Dates for Field Testing at SLAC*

June 29	and	June 30
July 1	and	July 2
July 7	and	July 8
July 12	and	July 13
July 14	and	July 15
July 26	and	July 27
July 28	and	July 29

* subject to revision before confirmation

Map of SLAC and Path to Find Trailer 282



Field Test Details as per Request for Bids:

Test 1: Tunnel Test

The field testing and evaluation of the laser scanner will include a scan of an area at the Stanford Linear Accelerator Center such as a tunnel in which magnets and other typical components are present. The scan will include measurements of control points that have a common datum with existing Alignment Engineering Group control monuments. This will ensure that the laser scans can be integrated with existing and new surveying control data for a positional tie to an existing network datum. The three-dimensional scans will have the ability to be overlapped and connected due to the unique geometry of the tunnel having a limited width but substantial length.

More specifically, the location of the test will be most likely at a section of the beamline in the South Final Focus of the Stanford Linear Collider. It will be around 10 meters long and comprise at least three unique magnets plus a BPM (Beam Position Monitor) and a collimator. Scanner coverage will also include the existing pipes, wires and hoses as well as the walls in the region.

The classical tooling used at the Stanford Linear Accelerator Center consists of a series of 1½" diameter steel spheres. They are placed on a nest (also known as a Hubbs Cup) that itself fits into a ¼" hole located on a component. With this setting, the center of the sphere is straight over the axis of the ¼" hole at a height offset of exactly 1". For use with the laser scanner, the steel spheres will be painted or preferably plated for optimal scanning reflectivity. The Stanford Linear Accelerator Center will supply these for the test. The steel spheres will be mounted on all accessible ¼" holes for each magnet as well as on the tunnel walls. The tunnel is approximately 3 meters in width and height and the walls are made of shotcrete. The beamline is located closer to one wall and is on a girder approximately 1 meter wide and 1.5 meters high. Testing in this area will ensure that this typical tunnel geometry—including the minimum range requirements described in Section 2—can be adequately covered with the candidate laser scanner.

Test 2: Building Test

Another field test will be conducted to identify the GIS abilities of the scanner. This shall consist of a three-dimensional scan of an existing building at the Stanford Linear Accelerator Center and an internal 3D scan of the same building's floor plan. The geometric integration of this wide range of data with existing control monumentation will be demonstrated.

Test 3: Accuracy Test

The third test will be conducted in the Stanford Linear Accelerator Center's Sector 10 laboratory using the highly accurate interferometric tape bench for analysis. A series of spherical targets will be placed in a row along a portion of the bench at various spacings. The positions of these targets will be measured with the interoferometer and then compared to the candidate laser scanner. In one setup, the laser scanner will be placed almost in-line with the targets and measurements will then be taken. This will primarily determine the accuracy of the distance measurements of the scanner since the angular field of view will be very small. In the next setup the laser scanner will be placed off to one side of the line of targets approximately 2 or 3 meters in distance. The targets will be scanned again but this time angular accuracy will be the primary concern since the overall angular coverage will be relatively large.