[1]451-337 Satellite Positioning and Geodesy
Practical Assignment 5 – GPS Control Survey

Aim

The aim of this assignment is to provide students with experience in the planning, data collection, processing, adjustment and analysis of a GPS survey within a network of existing CORS stations.

Tasks

The overarching objective of the project is to use GPS to derive accurate GDA94 coordinates and orthometric heights for the three points 8000, LAWN and TRACK. A location map and sketch plans for these points are attached. The following table shows the specific tasks that will need to be completed in order to satisfy the objectives of the project.

Task	Objective
1. Mission planning	(a) Determine satellite availability and suitable observing times
2. Data collection	(b) Collect field data to allow accurate 3D coordinates of each point to be established. (c) Download CORS data from two GPSNet sites for data processing.
3. Data processing	(d) Compute baselines in *LGO* software
4. Adjustment	(e) Use DNA to compute "best estimate" coordinates for the occupied points based on measured baselines and variance information
5. Analysis	(f) Analyse the results and evaluate quality and reliability
6. Orthometric heights	(g) Convert station heights into orthometric heights using AUSGEOID98
7. Report	(h) Prepare a report describing the project and presenting final results

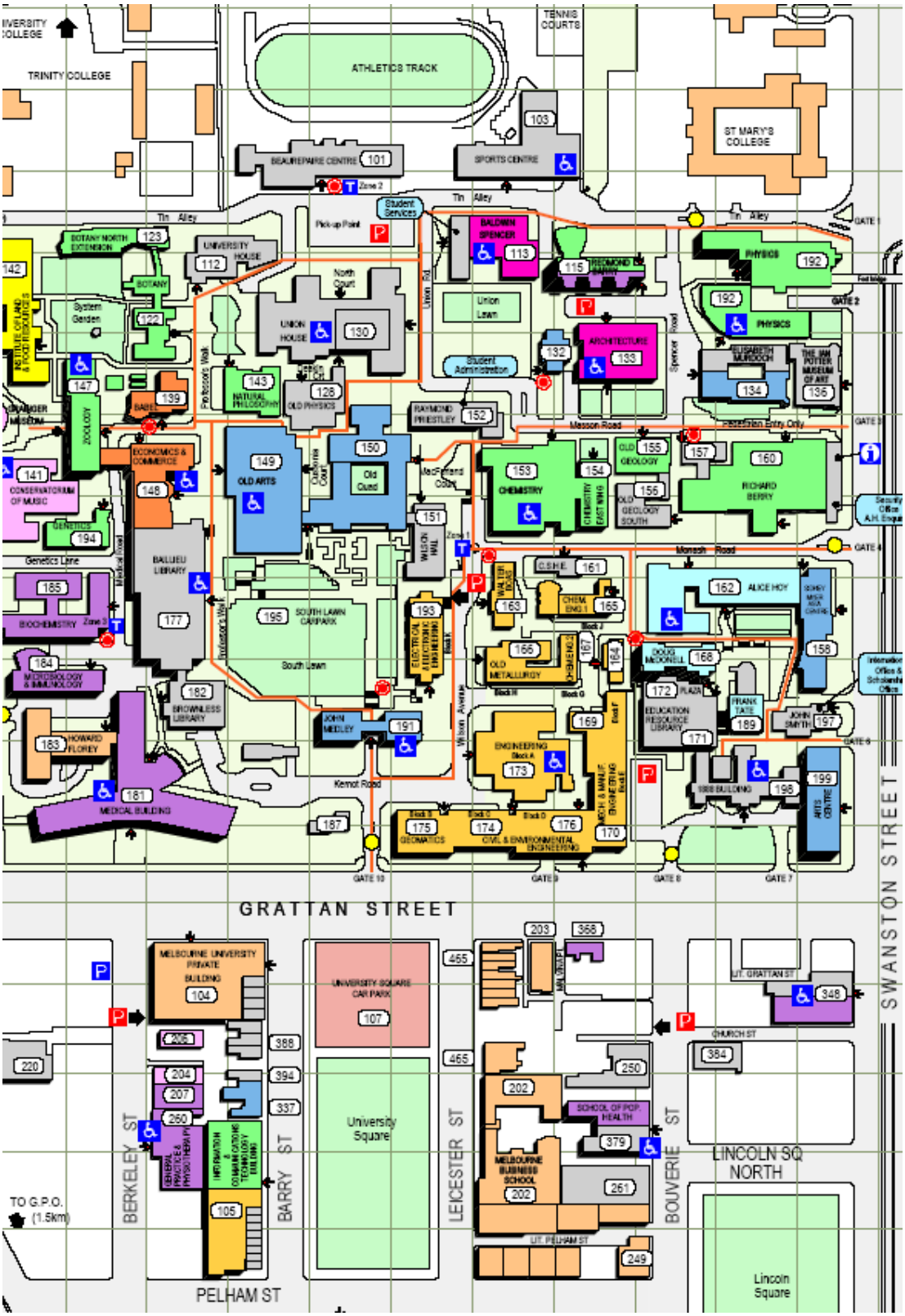
Students are to work in groups of three. A report covering the entire project is to be submitted by each group.

Submission details

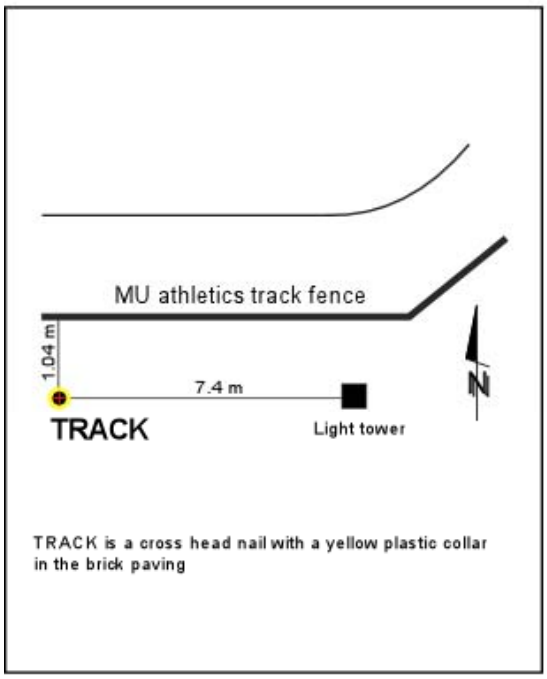
Due : 29 October 2008 Weight : 10%

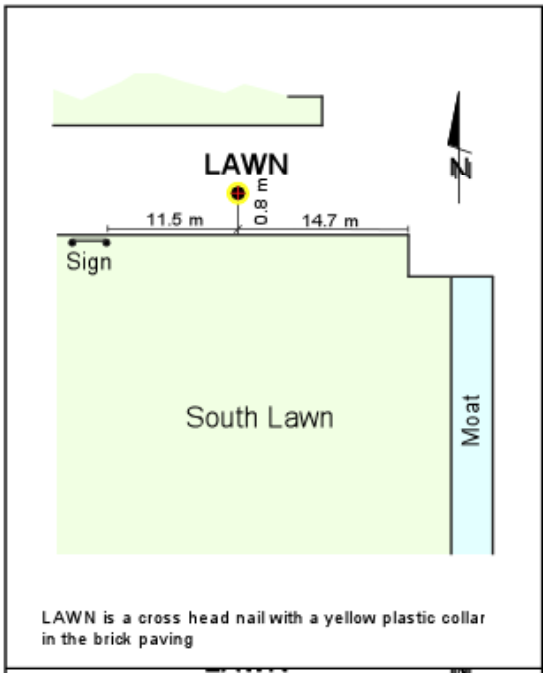
[1]

Location map



Sketch plans





Marking Guide :

Task	Marks available	Marks given
1. Mission planning (6 marks)		
• Site reconnaissance	2	
• Satellite availability	1	
• Network map	1	
• Session logistics	2	
2. Data collection (10 marks)		
• Field work	7	
• CORS data	3	
3. Data processing (10 marks)		
• Compute all non-trivial baselines	5	
• Ambiguities assessed	3	
• Problems identified and dealt with	2	
4. Adjustment and analysis (12 marks)		
• Minimum constraint adjustment	3	
• Outliers deleted	2	
• Variance matrix scaled appropriately	2	
• Constrained adjustment	2	
• GDA coordinates and precision achieved	3	
5. Orthometric heights (4 marks)		
• AUSGEOID N-values	2	
• Orthometric heights	2	
6. Report (8 marks)		
• Quality of presentation	4	
• Discussion and conclusions	4	
7. Final mark	**50**	