

**QUALITY CONTROL CHECK LIST FOR TOPOGRAPHICAL GROUND SURVEYS**

**SURVEY UNDERTAKEN BY:** .....

**DATE:** .....

**SURVEY PROJECT DESCRIPTION:** .....

**REPORT NO:** .....

**JOB NUMBER:** .....

I hereby confirm that this survey was checked against and complies with the project specifications and TMH11 survey requirements as stated in the survey instruction/contract documents.

The Items that do not form part of the survey instruction are marked as N/A.

	<b>SOME OF THE MOST IMPORANT REQUIREMENTS</b> <b>Note: Not all requirements have been listed</b>	<b>Confirmation by a registered Surveyor</b>
<b>1.</b>	<b>PERMANENT SURVEY CONTROL</b>	
1.1	Were the permanent survey control observations and coordinates submitted to the Client for approval prior to acceptance?	
1.2	Was a final coordinate list supplied in Excel and hard copy formats for approval	
1.3	Did the final coordinate list conform to the requirements	
1.4	Were the beacons numbered correctly	
1.5	Was the final coordinate list signed by a registered Surveyor?	
1.6	Did the positions (locations) of the permanent control meet the requirements?	
1.7	Was the spacing of the control beacons correct in terms of the requirements? (normally 300m road surveys – see specifications for bridge site surveys)	
1.8	Did the fixing of the permanent beacons (horizontal and vertical) adhere to normal survey practice and standards?	

1.9	Did the accuracy meet the requirements?		
1.10	Were the heights based on correct datum and was the datum height determined correctly?		
1.11	Was the height datum point number and height shown on the coordinate list?		
1.12	Were the calibration results between beacons for horizontal fixing submitted?		
1.13	Can the calibration results be accepted?		
1.14	Were the level comparisons between levels and check levels as well as the actual and allowable closing errors supplied?		
1.15	Were the independent height checks by GPS observation supplied?		
	<ul style="list-style-type: none"> <li>Did the independent GPS height checks conform to the requirements?</li> </ul>		
1.16	Did the level accuracies between level and check levels adhere to TMH11 requirements?		
1.17	Did the level closure between terminal points adhere to TMH11 requirements?		
1.18	What percentage of height differences between level and check exceeds 5mm?	0 – 5mm	%
	<i>Note: Acceptable if not more than 5% exceeds 5mm and 0% exceeds 10mm</i>	> 10mm	%
1.19	Were the raw survey data supplied for fixing PRMs		
1.20	Was the process of fixing control in position and elevation fully discussed in the survey report		
1.21	<b>General Comments on the Fixing of Permanent Survey Control:</b>		
<b>2.</b>	<b>VERIFICATION OF PERMENT SURVEY CONTROL</b>		
2.1	Were the verification report, results and the recommendations by the Surveyor submitted to the Client prior to acceptance of the values?		
2.2	Was a permanent beacon condition report submitted prior to final acceptance?		
2.3	Did both reports form part of the final submission to the Client on completion?		
2.4	Was the raw survey data supplied for the verification survey?		

2.5	Was the verification of permanent survey control in accordance with TMH11 and the project specifications?	
2.6	<b>General comments on the Verification of Permanent Survey Control:</b>	
<b>3.</b>	<b>DTM SURVEY</b>	
3.1	Was the road prism (toe line to toe line) surveyed using a Total Station?	
3.2	Was the road surface surveyed using laser scanners?	
3.3	Was the rest of the survey area surveyed using Total Stations?	
3.4	Were maximum 10m spot shot intervals surveyed on the road prism?	
3.5	Were the spot shots off the road prisms surveyed to a maximum of 20m intervals?	
3.6	Were break lines correctly utilized?	
3.7	Were cut and fills used as break lines?	
3.8	Were the triangles in the culvert and bridges cleaned to give a realistic representation of the culvert?	
3.9	Were the spot shot position, codes and heights shown in the 3D continuous model?	
3.10	Was the decimal point of the spot shot also the position where the spotshot was taken?	
3.11	Were the spotshot positions, codes and heights shown on three different layers in the CAD data?	
3.12	Was the DTM supplied in:	
	DWG format as per specification (No 3D faces)?	
	DGN-TIN format as per specification (No 3D faces)?	
	Model Maker format as per specification?	
	Civil Designer format as per specification?	
3.13	Could all the above files be opened from the source that was submitted?	
3.14	Was the raw survey data supplied for the DTM survey?	
3.15	Was the DTM survey in accordance with TMH11 and the project specifications	

3.16	<b>General comments on DTM Survey:</b>	
<b>4.</b>	<b>CAD WORK</b>	
4.1	Were the following supplied?:	
4.1.1	Continuous 2D drawing	
	<ul style="list-style-type: none"> <li>• Continuous 2D CAD drawing in DGN format (MicroStation)?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Continuous 2D CAD drawing in DWG format (AutoCAD)?</li> </ul>	
4.1.2	A0 Drawings	
	<ul style="list-style-type: none"> <li>• A0 drawing in DGN format</li> </ul>	
	<ul style="list-style-type: none"> <li>• A0 drawing in DWG format</li> </ul>	
	<ul style="list-style-type: none"> <li>• A0 layout key plan indicating all cadastral, permanent survey control positions and numbers, road alignment and sheet layouts (The first sheet of the A0 range)</li> </ul>	
4.1.3	Continuous 3D drawing	
	<ul style="list-style-type: none"> <li>• Was a continuous 3D drawing in DGN format (MicroStation) supplied?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Was a continuous 3D drawing in DWG format (AutoCAD) supplied?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Was the DTM-TIN (triangles) supplied as a separate layer on the 3D continuous CAD drawings</li> </ul>	
4.1.4	Survey codes	
	<ul style="list-style-type: none"> <li>• Was a list of survey codes and descriptions supplied?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Did the survey codes conform to the requirements in TMH11?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Was the survey undertaken using the supplied codes?</li> </ul>	
4.1.5	General CAD work	
	<ul style="list-style-type: none"> <li>• Has the extent been covered by the survey as specified?</li> </ul>	

	<ul style="list-style-type: none"> <li>• Was the culvert detail submitted in terms of the specifications?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Were clearance heights for all overhead services shown on the drawing?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Were clearance heights for all overpass bridges shown on the drawings?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Were the positions of bridge columns/pillars shown on the drawing?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Were Invert levels, ground levels and grid levels for manholes supplied?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Were photos of all road signs in hard copy and digital format supplied?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Were the road sign positions numbered on the drawings and on the photos?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Were major access roads and streets surveyed to the specified length?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Were access road destinations and street names shown on the drawings?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Were the positions and numbers of the permanent survey control shown on the drawing as a separate layer?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Was the cadastral data submitted on the final drawings?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Does the presentation of the cadastral data on the drawings conform to the requirements?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Were all features on different layers as specified?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Were the layers named correctly?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Did the layers conform to the requirements?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Did the lettering conform to the requirements (size and thickness)?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Were the triangles and detail of cross-roads on a separate layer or drawing?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Were the correct symbols used in accordance with TMH11?</li> </ul>	
	<ul style="list-style-type: none"> <li>• Were the lane markings correctly represented (Broken, solid, broken &amp; solid lines)?</li> </ul>	
4.1.6	Project File – Were the following supplied?:	
	<ul style="list-style-type: none"> <li>• Survey report hard copy</li> </ul>	

	<ul style="list-style-type: none"> <li>• Survey report digital</li> </ul>	
	<ul style="list-style-type: none"> <li>• Final coordinate list hard copy</li> </ul>	
	<ul style="list-style-type: none"> <li>• Final coordinate list Excel</li> </ul>	
	<ul style="list-style-type: none"> <li>• Level comparison hard copy</li> </ul>	
	<ul style="list-style-type: none"> <li>• Level comparison Excel</li> </ul>	
	<ul style="list-style-type: none"> <li>• Test results Excel</li> </ul>	
	<ul style="list-style-type: none"> <li>• Verification report and results</li> </ul>	
	<ul style="list-style-type: none"> <li>• Laser scanning reports as specified</li> </ul>	
	<ul style="list-style-type: none"> <li>• All other deliverables as specified in the specifications</li> </ul>	
4.1.7	Is the CAD work in accordance with TMH11 and the project specifications?	
4.1.8	<b>General comments on CAD Work:</b>	
<b>5.</b>	<b>QUALITY CONTROL BY THE SURVEYOR</b>	
5.1	Were the field and office checked A0 plans submitted on completion?	
5.2	Were the corrections to the field and office checked plans transferred to all the final CAD drawings?	
5.3	Were test cross-sections every 300m surveyed independently from the actual setup from where the survey was done?	
5.4	Were the 30m check points data and results submitted for laser scanning projects in addition to the 300m cross-sections?	
5.5	Did the surveyed check points represent the profile of the road?	
5.6	Do the check results conform to the accuracy standards?	
	0 - 30mm (85%) on the black top	
	0 – 150mm (85%) off the black top	
5.7	Was the quality control by the Surveyor undertaken in accordance with TMH11 and the project specifications?	

5.8	Was the quality control check list as per Annexure 24.1 submitted and signed by a registered Surveyor? (Only for use by the Client)	
5.9	<b>General comments on Quality Control by the Surveyor:</b>	
<b>6.</b>	<b>GENERAL COMMENTS</b>	
6.1	Was the project delivered on time?	
6.2	Does the labeling of CDs conform to the requirements?	
6.3	Does the naming of files and folders conform to the requirements?	
6.4	Was a delivery note, showing all data submitted, supplied on completion and any other subsequent submissions?	
6.5	Was the version number of the data shown on the CDs submitted?	
6.6	Was all the data re-submitted with the re-submission, after corrections or extension surveys have been done, in order to facilitate deletion of the previous version?	
	<b>Any other general comments not stated before:</b>	

I, the undersigned, being the representative of the appointed survey company on the above project, hereby certify that:

1. All information required in the project specifications is hereby supplied.
2. All field and office checks have been carried out in terms of the relevant requirements and specifications.
3. All data supplied conforms to the relevant requirements and specifications for this project.
4. All corrections as instructed in the previous report have been corrected and the entire survey project is re-submitted.

Signed at.....this.....day of .....

Signature: .....

Plato Registration Number: .....

Name: .....

For and on behalf of (Survey Company): .....