



## Spatial Services

## POSI SO-xxx PM140175 Smithfield Traverse GDA2020

### Adjustment Details

Adjustment By	John Surveyor	POSI Ref (If applicable)	SO-xxx
Organisation	Survey Co.	Horizontal Class	B <input checked="" type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E <input type="checkbox"/>
Adjustment Date	30/7/2021	Vertical Class	LB <input type="checkbox"/> LC <input type="checkbox"/> LD <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input checked="" type="checkbox"/> E <input type="checkbox"/>
Document Version	v1.0	Horizontal Datum	GDA2020 <input checked="" type="checkbox"/> N/A <input type="checkbox"/>
Location	Katoomba	Vertical Datum	AHD <input type="checkbox"/> GDA2020 <input checked="" type="checkbox"/> N/A <input type="checkbox"/>
Adjustment Type	Traversing <input checked="" type="checkbox"/> Trig Heighting <input type="checkbox"/> Levelling <input type="checkbox"/> GNSS Static <input type="checkbox"/> GNSS RTK <input type="checkbox"/> AUSPOS <input type="checkbox"/>		

### Field Work Details

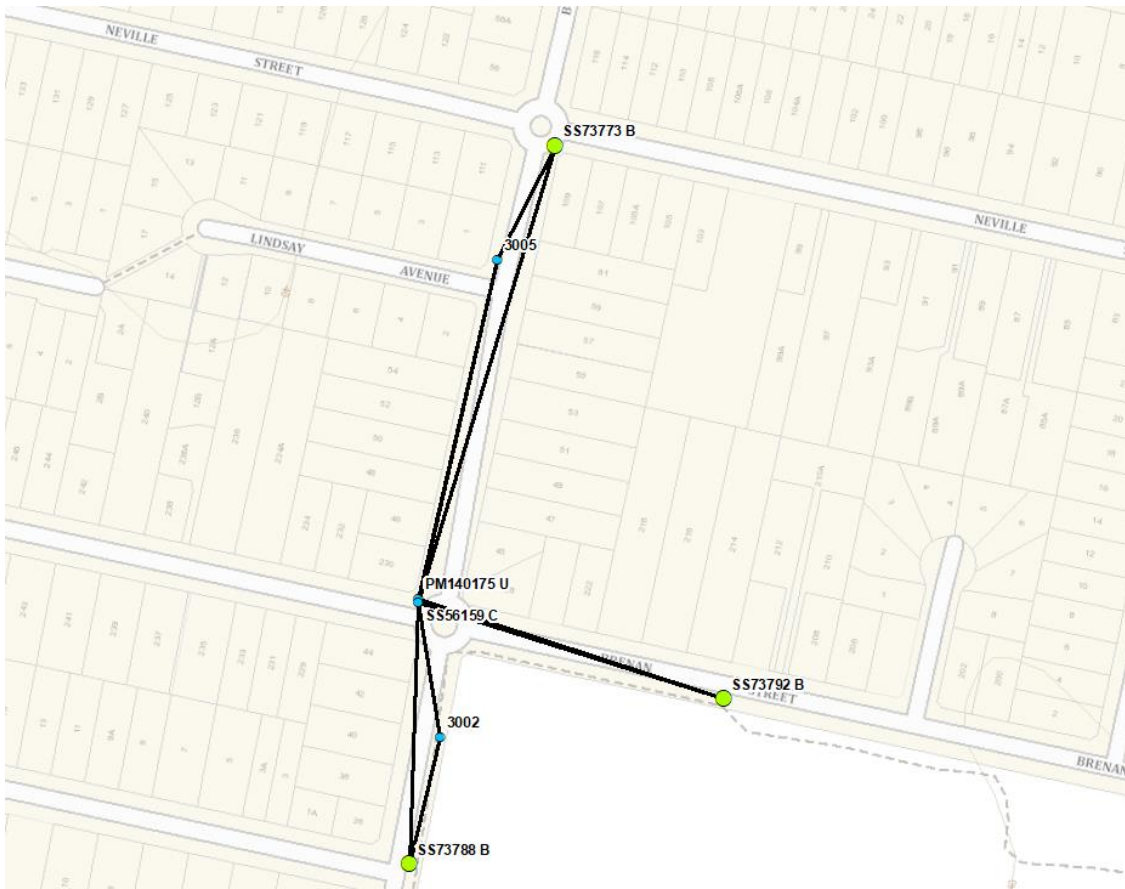
Organisation	Survey Co.
Date of Fieldwork	21/6/2021
Survey Checklist File Name	SGD12_Checklist_Smithfield_Traverse.docx
Supporting Documents	Field Notes <input checked="" type="checkbox"/> Log Sheets <input checked="" type="checkbox"/> Photos <input checked="" type="checkbox"/>

Observations to temporary station 3002 were repeated due to disagreements found in the initial setup.

### Equipment Details

Equipment Type	Equipment Make	Model No.	Serial No.	IGS14 Antenna Model Applied	Verification / Calibration Date
Total Station	Leica	TS15	Xxxx xxxx	N/A	5/2/2021

## Network Design



Traverse shown in black with survey marks that have been constrained shown via the green circles.

## Processing / Reduction Strategy

<b>Processing / Reduction Software</b>		FB04 v10.0.1
<b>Raw Data (Original) File Name</b>	<input checked="" type="checkbox"/>	21-000 Post Construction.gsi
<b>Raw Data (Spatial Services) Format File Name</b>	<input checked="" type="checkbox"/>	21-000 Post Construction.asc
<b>Raw Data (Edited) File Name</b>	<input checked="" type="checkbox"/>	Final adjustment Post Construction Version 4.asc

The raw data (in GSI and DCS Spatial Services format) was downloaded from the instrument, uncorrected for temperature and pressure.

In-house program FB04 was used to apply temperature and pressure corrections as well as prism constants to reduce distances to the ellipsoid. All angle and direction observations have been appropriately reduced to grand means in preparation for the least squares adjustment. Station names have been corrected for SCIMS (e.g., SS73788, PM140175)

## Adjustment Strategy and Option Used

<b>Adjustment Software</b>	Microsearch Geolab 2001 v2001.9.20.0
<b>GNSS Static Baseline Weightings</b> (final) <input type="checkbox"/>	N/A
<b>Total Station Observation Weightings</b> (final) <input checked="" type="checkbox"/>	EDIST: 3mm + 3ppm, 1mm centering from/to DIR: 3", 1mm centering from/to HDF: 8mm + 20ppm, 1mm centering from/to
<b>Levelling Weightings</b> (final) <input type="checkbox"/>	N/A
<b>Other Weightings</b> (final) <input type="checkbox"/>	N/A

A 3D minimally constrained adjustment has been run to check the quality of the survey and determine Class.

No fully constrained adjustment has been run as no current SCIMS survey control is available. This has been discussed with and agreed to by DCS Spatial Services. As such, provisional coordinates, heights and uncertainties will not be determined via this adjustment.

## Minimally Constrained Adjustment

<b>File Name</b>	21-000_GDA2020-MC.iob		
<b>Variance Factor</b>	0.5751	<b>No. of Flagged Residuals</b>	0
<b>Chi Square Test</b>	Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A <input type="checkbox"/>	<b>Maximum Std Res</b>	3.378
<b>Horizontal Class</b>	B <input checked="" type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/>	<b>Associated Mark / Line</b>	SS56159 to SS73788
<b>Vertical Class</b>	LB <input type="checkbox"/> LC <input type="checkbox"/> LD <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input checked="" type="checkbox"/> E <input type="checkbox"/>	<b>Corresponding Residual</b>	DIST 0.009m

**SS73773 (B)** and **SS73778 (B)** have been **fixed** in GDA2020 horizontal coordinates and ellipsoid height. Coordinates and height have been sourced from the processed AUSPOS observations for SS73773 and SS73788.

The initial variance factor (VF) from the adjustment is elevated at 1.3399, which fails the Chi-Square test. Inspecting the group VFs, the distance component (EDIS) is extremely elevated at 3.771 and completely unbalanced when compared to the direction (DIR) and height difference (OHDF) components of the traverse. This indicates that there is a high degree of tension in the network and that the input standard deviations are not appropriate, particularly for the distance component.

The input standard deviations have been loosened for distances (**EDIS**) from 3mm +/- 3ppm to (**5mm +/- 5ppm**) and the adjustment re run. Final adjustment statistics are shown in the table above.

Based on the statistical results of this adjustment, survey practice adopted, equipment/instrumentation used and reduction techniques employed, it is recommended to award the survey a GDA2020 **horizontal Class B** and **vertical Class D**.

## Adjustment Constraints

<b>GDA2020 Constraints</b>	Yes <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	
<b>AHD71 Constraints</b>	Yes <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	

**Fully Constrained Adjustment**

<b>File Name</b>	N/A		
<b>Variance Factor</b>	N/A	<b>No. of Flagged Residuals</b>	N/A
<b>Chi Square Test</b>	Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	<b>Maximum Std Res</b>	N/A
<b>Horizontal PU Calculated</b>	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	<b>Associated Mark / Line</b>	N/A
<b>Vertical PU Calculated</b>	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	<b>Corresponding Residual</b>	N/A

**Recommendation**

<b>Horizontal Class</b>	B <input checked="" type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E <input type="checkbox"/>	<b>Vertical Class</b>	LB <input type="checkbox"/> LC <input type="checkbox"/> LD <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input checked="" type="checkbox"/> E <input type="checkbox"/>
<b>PU Calculated</b>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>FC Adjustment Date</b>	N/A

**Submission Statement**

I, **John Surveyor**, of **Survey Co.**, present the survey outlined in this report as meeting the requirements of a horizontal Class **B** and / or vertical Class **D** control survey as per *Surveyor-General's Direction No. 12*.

I understand that the inclusion of these results in SCIMS and their final Class and uncertainty classification is at the sole discretion of DCS Spatial Services.

A signed checklist, as per the requirements of *Surveyor-General's Direction No. 12* is attached.

**Signed:** *Include signature here*

**Dated:** *Include date of signature here*

**End of Report**

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*DCS Spatial Services use only*

**Analysis by DCS Spatial Services:**

**Comments by DCS Spatial Services Senior Surveyor or nominated representative:**

**Approved for SCIMS update:**

**Transaction Number:**

**SCIMS Updated:**