Accuracy of Geometric Geoid Model of Singapore using RTK Heighting

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GPS Heighting

\[ H = h - N \]

- Ellipsoidal height (h)
- Reduced Level / Orthometric height (H)
- Survey Department's Datum (based on Mean Sea Level)
- Geoid Model (N)
- GPS

RE-ESTABLISHING OF SINGAPORE PRECISE LEVELLING NETWORK
464 PLBMs used in geoid computation but 58 of the PLBMs with RTK ellipsoidal heights are not able to fit in!

Spatial distribution of 2 sets of Check BMs:
1. The resurveyed 58 problematic benchmarks with revised RTK procedure (in red)
2. 26 BMs with post-processed and 6 BMs with RTK ellipsoidal heights (in blue)
Results of the Resurveyed 58 problematic benchmarks

SGeoid09 - “Geoid Model” or Converter for Singapore
Verification of SGeoid09

Using multiple regression forward stepwise method, RTK heighting and the precise levelling, it is able to achieve accuracy to within ±0.030 m, ±0.040 m and ±0.050 m for 82%, 95% and 99%, respectively, of the sampled data.
Recommended Procedure for RTK Heighting

• Recommended to perform 5 separate initializations and to acquire 3 readings in each, i.e. minimum of 15 reading in all, for each benchmark

Conclusions

• The SGeoid09 is suited in engineering applications which can accommodate ±5 cm uncertainty in the height