

# Nilamtec T3F

Application  
for CITF Pre-approval Product

Strobus (Far East) Ltd

Nov 25, 2020

# 產品簡介

- ▶ 申請者: Strobos (Far East) Ltd
- ▶ 產品名稱: Nilamtec T3F
- ▶ 規格: cm level GNSS tablet



- ▶ 主要功能:
  - ▶ 1. cm level surveyor grade GNSS positioning
  - ▶ 2. Android computing platform for BIM/GIS and other engineering software applications
  - ▶ UHF RFID (optional) for field asset / object tracking
- ▶ 採用之技術: GNSS RTK, Android, RFID
- ▶ 涉及的建造過程: Survey, and all outdoor engineering works
- ▶ 對建造過程的主要改善 :
  - ▶ 生產力: save cost and manpower in survey works, share engineering data with accurate location information on real time basis. Implement BIM/GIS in a single device.
  - ▶ 質素: Field supervisor can review the construction progress with accurate location by himself.
- ▶ 過往產品的應用情況:
  - ▶ 工程項目名稱 : HK Airport Multiple Projects/Applications,
  - ▶ 地點: HK Airport,
  - ▶ 試用/應用: Trial,
  - ▶ 年份: 2020

# 創新元素

- ▶ 主要技術:
  - ▶ GNSS RTK, Android, RFID
- ▶ 專利 (如適用):
  - ▶ n/a
- ▶ 與現行做法及普遍產品型號的比較:
  - ▶ 技術: triangulation
  - ▶ 規格: 3-person operated optical equipment to determine the location of a point by forming a triangle with known points
  - ▶ 得益包括成本效益 (產品價錢與效益): Triangulation is time and manpower consuming, it takes hours and days to determining the co-ordinate. T3F can find the co-ordinate of a target point in seconds in open sky.
- ▶ 與現行做法及普遍產品型號的比較:
  - ▶ 技術: GNSS Rover (Leica GS15)
  - ▶ 規格: Leica GS15 supports GPS, GLONASS , and Galileo only.
  - ▶ 得益包括成本效益 (產品價錢與效益):
    - ▶ Leica GS15 price is approx. 4 times of Nilamtec T3F.
    - ▶ Nilamtec T3F supports GPS, GLONASS, Galileo and Beidou.
    - ▶ Nilamtec T3F can reach “fixed” status in urban area, GS15 can not.
- ▶ 與預先批核名單內產品及競爭者的比較:
  - ▶ 技術: Nilamtec T2F
  - ▶ 規格:
    - ▶ Nilamtec T2F Horizontal accuracy: 1cm; vertical accuracy: 10 cm.
    - ▶ Nilamtec T3F horizontal accuracy 1cm, vertical accuracy 1cm
  - ▶ 得益包括成本效益 (產品價錢與效益): Better accuracy.
- ▶ 產品首次發布日期: Oct 2020 (產品首次發布及最新版本)

# 應用例子

- ▶ 應用相片/圖紙/影片2
  - ▶ [by integrating with Esri ArgGIS apps, Nilamtec T3F is used for underground utilities construction and management projects. The Device is used to record the precise spatial data in site, and reporting fault cases in real time basis. ]
- ▶ 工程項目例子: [Underground Utilities Management, Hong Kong Airport, 2020]
- ▶ 涉及之建造過程: Surveying, GIS
- ▶ 於工程中的用途/功能:
  - ▶ • Spatial Data Recording
  - ▶ • Report of Fault Cases

# 得益 - 生產力 (如適用)

- ▶ 改善以下生產力:
  - ▶ 方法/方面1 : record as built spatial information of underground facilities]
  - ▶ [方法/方面2 : report fault cases with precise location information in real time basis
- ▶ 傳統產量:
  - ▶ Recording 100m underground facilities spatial information/ 3 man-day
- ▶ [Nilamtec T3F]產量:
  - ▶ Recording 100m underground facilities spatial information / 0.5 man-hour
- ▶ 總共節省人日數:
  - ▶ 3人日
- ▶ 總共節省工程項目時間:
  - ▶ 1日
- ▶ (請適當地提供實際數字以茲證明)

# 得益 - 質素 (如適用)

- ▶ 改善以下質素:
- ▶ [方法/方面1 : Site supervisor use T3F to check and report if the work on specific location is complied with the design on real time basis.]
- ▶ [方法/方面2: T3F GNSS accuracy is further improved, especially in vertical error.]

# GNSS Accuracy Test Against Known Reference Points

Error Against Known Reference:

N: +0.007m  
E: -0.003m



HKBN 4G+ CMHK 16:51

Geodetic Survey...  
geodetic.gov.hk

Transform From: WGS84 (ITRF96) Geographic (DDD.DDDD)  
Transform To: HK1980 Grid

ical Transformation Geoid model refers to HKGEOID2016\_SMO20170726

Keyin Table

| Point ID    | Latitude (DDD.DDDD) | Longitude (DDD.DDDD) | Ellipsoidal Height (m) | Northing (m) | Easting (m) | Height above HKPD (m) | Remark |
|-------------|---------------------|----------------------|------------------------|--------------|-------------|-----------------------|--------|
| 22.37288450 | 113.97054100        | 0.4                  | 825981.158             | 815017.676   | 4.179       |                       |        |
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STATION NO.: **8036.017** (FORMER NO.: \_\_\_\_\_)  
LOCALITY: **WU CHUI ROAD, TUEN MUN** SURVEY SHEET NO.: **6-SW-16A**

|              |   |
|--------------|---|
| HK 80 DATUM  | HK 1980 GRID COORDINATES : N = <b>825 981.151</b> m, E = <b>815 017.679</b> m, Class : <b>H4.1</b><br>Ht = _____ m above HKPD and measured to the top of mark, Class : _____      |
| WGS 84 DATUM | GEOGRAPHICAL COORDINATES : Lat = _____ N, Long = _____ E, Class : _____<br>Ht = _____ m above Ellipsoid and measured to the top of mark, Class : _____<br>Reference Frame = _____ |

STATION PHOTO

(8036.017, USM)  
28-03-2008

(8036.017, USM)  
28-03-2008

# GNSS Accuracy Test Against Known Reference Points (Vertical Test)

| Point ID | Latitude (DDD.MMSS) | Longitude (DDD.MMSS) | Ellipsoidal Height (m) | Northing (m) | Easting (m) | Height above HKPD (m) | Remark |
|----------|---------------------|----------------------|------------------------|--------------|-------------|-----------------------|--------|
| 30781    | 22.23273150         | 114.11206694         | 193.2                  | 827963.908   | 837524.372  | 196.000               |        |
| 30779    | 22.23368124         | 114.11132066         | 183.9                  | 828256.032   | 837310.881  | 186.708               |        |

**BENCH MARK SUMMARY**  
 BENCH MARK NO. : 30779 (FORMER NO. : ) CLASS :  
 Height above HKPD : 186.7035m (To Top of Mark)  
 HK 1980 GRID COORDINATES (APPROX.) : N = 828.256 m, E = 837.311 m  
 LOCALITY : FO TAN, SHATIN  
 SURVEY SHEET NO. : 7-SW-10B

LOCATION MAP Scale: 1:5000  
 STATION SKETCH (Not to scale)  
 TYPE OF MARK : STEEL ROD

REMARKS :  
 BUILT ON CATCHPIT AND 0.2m ABOVE GROUND.

Prepared by: Geodesi/NT Checked by: LAO K.F. Approved by: YIU K.M./LSG(NT) Date: 01/05/2001  
 Geodetic Survey Section SMO, Lands Department Copyright reserved

**BENCH MARK SUMMARY**  
 BENCH MARK NO. : 30781 (FORMER NO. : ) CLASS :  
 Height above HKPD : 195.9265m (To Top of Mark)  
 HK 1980 GRID COORDINATES (APPROX.) : N = 827.954 m, E = 837.525 m  
 LOCALITY : FO TAN, SHATIN  
 SURVEY SHEET NO. : 7-SE-6C

LOCATION MAP Scale: 1:5000  
 STATION SKETCH (Not to scale)  
 TYPE OF MARK : STEEL ROD

REMARKS :  
 MARK ON R.C.C. BEAM OF PAVILION 1.3m BELOW WALL

Prepared by: Geodesi/NT Checked by: LAO K.F. Approved by: YIU K.M./LSG(NT) Date: 01/05/2001  
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## Error Against Known Reference:

30781:  $196 - 195.9265 = 0.0735 \text{ m}$

(sky window: blocked by trees, pole high: 2.2m)

30779:  $186.708 - 186.7035 = 0.0045 \text{ m}$

(sky window: open sky, pole high: 2m)



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