

1. Introduction

1.1 Outline of Survey Results

1.1.1 Table of survey results and lists of survey results

- 1) Survey results prepared in the year 1999 consist of six types of coordinate results where four are based respectively on local, horizontal, GRS80 and ITRF94 coordinate systems and two are based respectively on local and horizontal coordinate systems with geoid correction.
- 2) Furthermore, the results of the survey conducted once every year between 1996 and 1998 have been revised in the same format as the survey results in 1999 after recalculating.
- 3) As shown in Table 1 below, all of these aforesaid survey results are compiled in the following two formats: (1) "Table of Survey Results" where all the six types of survey results have been compiled separately by location (observation station) and by year; and (2) "List of Survey Results" where coordinate results based on horizontal coordinate system (with geoid correction) for the last four years (from 1996 to 1999) are displayed collectively.

Table 1 Types of survey results

Types	Coordinate system	Geoid correction	Coordinate value
Table of survey results	Local coordinate system	Without	X, Y, Z
	Ditto	With	X, Y, Z
	Horizontal coordinate system	Without	N, E, U
	Ditto	With	N, E, U
	GRS80 coordinate system	Without	Latitude, longitude, ellipsoidal height
	ITRF94 coordinate system	Without	X, Y, Z
List of survey results	Horizontal coordinate system	With	N, E, U

4) Four types of coordinate system shown in Table 1 are as follows:

(a) Local coordinate system

This is a coordinate system that ITRF94 earth-centered orthogonal coordinate system be shifted to the reference point ("station datum" from hereafter). There is one station datum for each station..

Station datum: Koganei station -> S3, Kashima station -> S3, Miura station -> S3, Tateyama station -> L2

(b) Horizontal coordinate system

Orthogonal coordinate system with plumb line axis set as U-axis, east as E-axis and north as N-axis at station datum (set in each observation station).

(c) GRS80 coordinate system

The geodetic coordinate system in ITRF94 frame where GRS80 ellipsoid is used.

(d) ITRF94 coordinate system

Earth-centered orthogonal coordinate system with Greenwich direction set as X-axis, earth's axis as Z-axis and the direction of X-axis around Z-axis that has been turned 90 degrees counterclockwise as Y-axis.

1.1.2 Observation values of SLR reference point (using survey method B)

- 1) Observation values of SLR reference point using survey method B are the observation values of horizontal angle, vertical angle and slope range of survey points shown in Table 2 below that have been measured by NET-2B.

Table 2 Horizontal angle reference directional point and survey points at each station (observation station)

	Koganei station	Kashima station	Miura station	Tateyama station
Horizontal angle reference directional point	H1	Survey suspended	S1	H1
Survey points	L1, L2, L3, H1, H2 SR-L1, SR-L2, SR-L3 SR-H1, SR-H2		L1, L2, L3, H1 SR-L1, SR-L2, SR-L3 SR-H1	L1, L2, L3, H1, H2 SR-L1, SR-L2, SR-L3 SR-H1, SR-H2

- 2) Survey points SR-** in Table 2 indicate the position of the center of the secondary mirror (reflection sheet for surveying has been attached) inside SLR telescope while SLR telescope aimed at long pillars L1, L2, L3 and leveling pillars H1, H2, respectively.
- 3) Horizontal angles shown in survey results are the values observed when the horizontal angle reference directional point was set as the reference point (0 deg. 0' 0") and the vertical angles are the values observed when the zenith was set as the reference point (0 deg. 0' 0").
- 4) L2 point at Koganei station was not possible to be measured by NET-2B, because of interference of visibility. Therefore, this point was measured by lifting a reflection sheet (241.8mm above L2 point).
- 5) At Kashima station, the survey was suspended due to some unknown reasons caused at the SLR telescope side that made it impossible to measure the range by NET2B.
- 6) At Miura station, observation values could not gained from H2 point due to a structure that blocked the optical route between SLR telescope and this point.