

8. Digital mapping

Digital mapping of the whole Study area was carried out based on the results of aerial triangulation. Digital mapping is done to obtain topographic features as three-dimensional data from the stereo model. The topographic features to be obtained were determined by the operating rules, but not all topographic features can be obtained from the aerial digital images. It can be said that digital mapping is the work to acquire the initial topographical map data from aerial photographs.

8.1 Acquisition method of topographic feature data

Topographic feature data that make up the topographic map data divided into data acquired from aerial photographs, data acquired from materials and data acquired from field identification.

8.2 Digital mapping information

Materials and data used for digital mapping are as follows:

- 1) Digital aerial photo images
- 2) Results and description of ground control points
- 3) Table of Symbols and application rules
- 4) Digital plotting manual

8.2.1 Instruments used

The Diap system manufactured by the International Sysmap Corporation of Canada was used for the digital mapping.

8.3 Scope of digital mapping work

8.3.1 Area covered by digital mapping

Digital mapping was carried out to cover 33,000 km², composed of 48 sheets to a scale of 1:50,000 (see Figure 8.3.1).

8.3.2 Digital mapping procedure

Initial topographic map data were acquired by the following steps

- 1) Determination of mapping sheets and preparation of aerial photo image data
- 2) Four corner coordinates and results of aerial triangulation set up to mapping system
- 3) Orientation of stereo model based on the results of aerial triangulation
- 4) Acquisition of topographic feature data according to the manual.
- 5) Output by printer and inspection of acquired data.

6) Data conversion to digital compilation forms and storage of the acquired data set

The acquired data was standardized to a common format to allow data compatibility with digital compilation instruments.

8.3.3 Inspection

The quality was examined with regard to the following two elements defined in the ISO19113 Quality Principles. In the inspection emphasis was placed on checking for the completeness of the data to be acquired and the standardization of interpretation of the topographic data.

1) Completeness

All topographic features to be acquired by aerial photograph have been acquired.

-Excessive: Features outside the definition are acquired.

-Leak : Defined features are not acquired.

The totals for the topographic features acquired were sought and the number, distance extended, area, etc., were specified in a table and verified. Moreover, the presence of the features was checked through the superimposition of orthophotos.

2) Reliability of attributes

It was confirmed that there were no errors in the classification of vegetation, public facilities, etc.

8.4 Preparation of orthophotos

Orthophotos were prepared for confirmation of the digital plotting and as materials for the field verification.

8.4.1 Preparation of DTM

DTM were generated for topographic features and orthophoto.

TIN (Triangulated Irregular Network) data were prepared from random height points that were observed by the process of image correlation. Then DTM was prepared from TIN in a lattice of 100m intervals.

8.4.2 Preparation of Orthophotos

Orthophotos of each sheet were prepared based on the digital aerial photo images, the results of aerial triangulation and the DTM. The orthophotos were completed after the mosaicking and tone adjustment of each sheet.

These orthophotos were used to check acquired topographic features and in the field verification.

8.5 Data arrangement and confirmation of map sheets

After preparation of the orthophotos, it was confirmed that the Study area covered 52 sheets . Four of the map sheets contained very little land area, and were included as extensions on neighboring sheets. Therefore, the final total number of sheets was 48.

The initial topographic map data that were prepared in the digital mapping stage will be compiled in the next digital compilation stage.

The initial topographic map data were stored on CD-ROMs after conversion to a standardized format (DWG), because a different system will be used in the digital compilation stage.

Map Sheet Index for 1:50,000 Scale Topographic Map (48MapSheets)

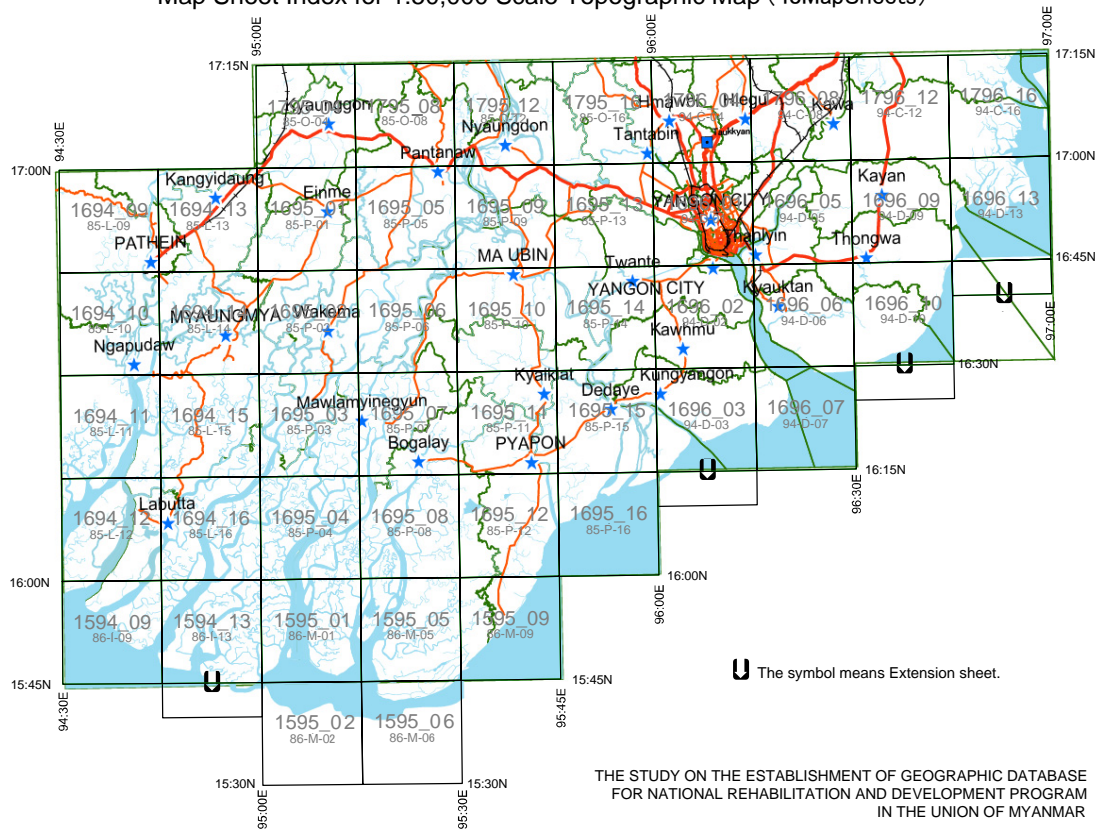


Figure 8.3.1 Final map sheets prepared in this Study

(“U” indicates the four extended sheets)