

EXTRACTS FROM THE BOOK

« SPECIFICATIONS FOR FIELD INSPECTION SURVEY »

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(Identification, classification, and annotation of items to be mapped for U. S. Navy Hydrographic Office, August 1947).

FOREWORD

The Hydrographic Office has agreed, in a reciprocal agreement with the Army Map Service, to produce topographic manuscript sheets, of areas adjacent to hydrographic surveys, suitable for reproduction of both nautical charts at various scales and topographic maps at a scale of 1:25 000. This requires the Photogrammetric Section, Hydrographic Office, to produce topographic manuscript sheets, whenever possible, in keeping with standard map specifications.

The purpose of these specifications is to give the personnel conducting the hydrographic survey sufficient information so that they will clarify ambiguous or doubtful features appearing on aerial photographs and to provide all other information that will enable the photogrammetrist to compile in the office the manuscript information that is as nearly complete for publication as the quality of the photographs will permit. It is obviously impossible to cover in these specifications, all the situations that may arise, but if the field engineer engaged on this work will keep the purpose firmly fixed in his mind, it should serve as a guide in all cases where he may be faced with doubts as to the scope of his activities.

SECTION I

SCOPE

There are numerous impediments to the complete and precise interpretation of aerial photographs by stereoscopic means. Vegetation often obscures ground detail that should be mapped. The foliage may often cover roads, trails, buildings or streams and consequently these features cannot be seen on the aerial photographs. Clouds, shadows or highlights on photographs will likewise obscure pertinent detail.

As a result of the transparency of water, the disturbance due to wave and tidal action, and the effect of light and shadow, it is very difficult to accurately delineate the highwater shoreline on aerial photographs. These factors also make it impossible to interpret accurately all shoreline and off-shore features such as rocky ledges, reefs, off-shore rocks and shoals. There is no reliable photogrammetric means of determining whether these features bare at low water and if so, how much, or whether the feature is covered at high water, etc.

The accurate classification of roads by stereoscopic inspection cannot readily be undertaken because of the variance of road images on the aerial photographs. Very often, a gravel road, under certain lighting conditions, will appear very bright and distinct on aerial photographs. This appearance might confuse the office compiler into classifying such a road as a first class highway. Conversely, a first class, hard surfaced, all weather road may be discolored by automotive exhaust or oil and grease stains. These discolorations would reduce the light reflecting from the road surface and the image on the aerial photograph would have the same tone as a dirt road.

In addition to those sources of misinterpretations, field lines often have the same appearance as roads or trails. Haystacks may be mistaken for small buildings, fence lines may appear to be ditches, and fire breaks may be mistaken for power lines. Small objects are often completely indiscernable because of the minuteness of their images on the aerial photographs.

It is self evident that a source, other than the aerial photographs, is required to supply the proper names for roads, promontories, rivers, buildings and other myriad items to be mapped. Likewise it is easily understood how difficult it is to ascertain on the photograph whether a particular building is a school, a post office, a factory or a hospital. All of those and numerous other types of buildings would have the same or very similar appearance on the aerial photographs.

In recognition of these foregoing deficiencies and limitations, all of the major government mapping agencies have adopted a policy of field editing and checking of all their photogrammetric compilations. This field edit and check consists of making a very detailed and rigorous inspection of the manuscript for completeness and accuracy, in addition to supplying all supplementary information needed.

However, field editing of the manuscript would not be feasible for the Hydrographic Office by the mere virtue of the remoteness or distance of the surveyed areas. It is, therefore, essential that the field party supply information on chart items that cannot be identified, classified or located by photogrammetric means. This work can be carried out concurrently with the control survey.

The nature and extent of the information to be secured by the field party will be in accordance with Sections II through V. The methods to be employed in obtaining the required data will be left to the discretion of the chief of the field party.

To insure completeness of classification and identification of chart items, it is recommended that an automobile or helicopter reconnaissance be made over all passable roads in the area to be mapped, and that all the required detail be annotated on the photographs. A boat or helicopter reconnaissance should be made of all shoreline or extensive inland water areas, wherever possible.

SECTION II

NAME DATA

Names shall be obtained for such features as rivers, creeks, lakes, canals, railroads, parks, cemeteries, cross-roads, communities, roads, important buildings, land grants, reservations, islets, promontories, air fields, valleys, mountains, hills, and other topographic features which bear names. Name data may be placed either on the back of the print or on the emulsion side, adjacent to the named feature. In all instances it must be clearly indicated on more than one print to insure positive association between the name selected and the feature to which it applies.

Whenever a photo index is supplied, annotation may be made on it, in addition to the field print annotations. This may facilitate the naming of large features, such as lengthy rivers, roads, railroads, large bodies of water, etc.

All name data in the area to be mapped shall be evaluated and only the most authentic source recorded.

SECTION III

IDENTIFICATION

A. Control.

All field established control, whether horizontal or vertical, must be positively identified on the field prints. This should be done by putting a needle-point prick mark on the photo, circling the point and annotating the name of the station in ink. Where the station is unidentifiable on the photo, it is essential that some nearby identifiable detail or image be selected and pricked. Then this feature should be referenced to the control station by azimuth and distance or by traverse. Another alternative would be for the field man to take a sufficient number of transit fixes on identifiable objects to permit them to be accurately located.

It must be stressed that the accurate identification of all control points is of the utmost importance. Control that is not, or cannot be, identified is of absolutely no value to the photogrammetric compilation. A liberal use of diagrams, sketches and explanatory notes is encouraged.

B. Cultural features.

The field party will be required to identify and classify only those features that are not clearly defined on the photographs or those that may be misinterpreted in the office.

The type of information required will be cited for a few of the major cultural features :

1. *Buildings and Structures*.—Only the more prominent or land mark buildings and structures need be field identified and named. For example : churches, schools, government buildings, railroad stations, factories, dams, mine or quarry works, pumping stations, graineries, radio stations, airport hangars, beacons, tanks and any other building or structure that might serve as a landmark from the surface or air. (See : *General Specifications for Photogrammetric Compilation of Topographic Maps*, First Edition, October 1945, for complete list). In addition to identifying the particular structure on the field print, it is necessary to give the nature of the building or structure, e.g., copper mine, radio tower, school house, etc. Wherever possible, supply the specific name of the building or structure, i.e., Brown's Coke Furnace, Orly Airport Control Tower, Public School No. 12, etc.

2. *Roads and railroads*.—(See : Section IV, Classification).

3. *Utility lines*.—Outside of urban areas, all utility lines of importance (landmark features) are to be field identified and classified. Included in this category are : cross-country power transmission lines, telephone and telegraph lines, pipe lines, submarine cables, etc. Since most of these features will be almost, if not completely, indiscernable on the photograph, it will be necessary to identify a sufficient number of points along the particular utility line to indicate its overall position. Location of the points where the line changes direction will suffice. In addition give the nature of the line, e.g., water pipe line, electric power transmission line, submarine telephone cable, etc. If a specific name is applicable, record it in the annotations.

4. *Aids to navigation (fixed)*.—Since these are very important features of the finished chart, all fixed aids to navigation must be identified on the field prints. The local name of each lighthouse must be supplied.

5. *Boundary line*.—All major political, civil and reservation boundaries must be delineated on the field prints or on a comprehensive sketch. In all cases indicate the nature of the boundary or reservation and supply the specific name, e.g., Anacostia Naval Air Station; Fort Brown, U.S. Army, etc.

6. *Bridges*.—(See : Section IV, Classification).

C. Hydrographic features.

1.—*Shoreline*.—The high water mark must be identified, and delineated by a dashed line, on a sufficient number of photographs to enable the accurate location of the shoreline. In general, the high water mark should be spotted or delineated at least on every third photograph of coastal flights. Where trees overhang the shoreline, the high water mark must be referenced to nearby identifiable detail. This will not be necessary where mangrove, Nipa palm, and prominent marsh grows in the area between low tide and high tide. In this latter case, the seaward extremity of the marsh or swamp is carried as the shoreline for the benefit of navigators.

2. *Offshore rocks, reefs, shoals, etc.*—All of these features must be identified on the field prints. It should be indicated if the feature uncovers at low tide, uncovers at high tide, etc., wherever possible. For example : Hogsty reef, coral; Brown's shoal, mud and sand; Pinnacle rock, etc.

3. *Hazards to navigation*.—All hazards to navigation must be identified on the field prints. In addition give the nature of the navigation hazard and the name, if one is applicable.

SECTION IV

CLASSIFICATION

A. Roads.

All roads are to be classified according to the type of construction and the number of lanes. For example : Hard surfaced, heavy duty, all-weather; hard surfaced, medium duty, all-weather; loose surface, graded and drained road; trail, etc. (See : *General Specifications for Photogrammetric Compilation of Topographic Maps*, First Edition, October 1945, for information on road classification.) In addition, indicate the number of lanes and the name and/or route number of the particular road. If the number of lanes changes along the course of a road, be sure to indicate the point at which that change occurs.

B. Drainage.

All drainage should be classified as perennial or intermittent. Local names of all hydrological features should be supplied wherever possible. Drainage that is partially obscured by vegetation must be delineated on the field prints. In flat areas, trace out the drainage pattern and indicate the direction of flow of streams.

C. Vegetation.

The outline of all land mark or representative vegetation features should be delineated on the field prints. The area should then be classified according to instructions in *General Specifications for Photogrammetric Compilation of Topographic Maps*, First Edition, October 1945. Supply names, wherever possible, e.g., United Fruit Banana Plantation, Rivera's Forest, Antelope Meadows, Mangrove Swamp, etc. For all vegetation, give the average height of the particular stand. This information is essential in the plotting of contours by stereophotogrammetric means.

D. Beaches.

All beaches should be classified according to their composition, e.g., sand, shingle, etc.

E. Railroads.

All railroads shall be classified according to gauge and number of tracks.

F. Bridges, Viaducts, Overpasses, Underpasses.

Identify the structure on the photograph and give a brief description as to type, design and number of spans, e.g., double span, 2 lane concrete; bascule, one lane, wood, etc. If the structure is of importance, record the local name.

SECTION V

ANNOTATION OF FIELD PRINTS

All identification of items to be mapped shall be made directly on the emulsion side of the field prints. Consult *General Specifications for Photogrammetric Compilation of Topographic Maps*, First Edition, October 1945, for a description of the items to be mapped and for standard mapping symbols.

The annotation may consist of circling the identified feature in ink and numbering the circle, or employing standard mapping symbols directly on the photo. Notes and sketches may be made on a separate sheet of paper. However, the print and number to which the note sketch applies should be clearly indicated.

See illustrations of the recommended type of annotations of the field prints (figure). Specific requirements are embodied in Sections II thru IV.

SECTION VI

MATERIALS FOR FIELD PARTY

The field party will be supplied the following materials to assist in the amassment and compilation of the required information:—

1. Two sets of unmarked aerial photographs. (Field prints.) One set is to be annotated (see : Section v) and the other set is to remain unmarked for field stereoscopic study ;
2. Enlargements of aerial photographs covering areas of dense culture or detail. These will be supplied wherever possible ;
3. Wherever possible, one photo index ;
4. All available source maps ;
5. Applicable map preparation instructions, specifications, etc.

In the course of the work on the project, the field party should endeavor to collect copies of all official maps, charts or plans, covering any portion of the area to be mapped. Any official city plans, local highway or railroad maps, plans of utilities layout, park or reservation maps, etc., may be of value in the office compilation of the finished manuscript.



