NAME OF SYSTEM:

Engineering Drawings Storage and Reproduction (with Color Overlays)

ORIGINATOR:

U.S. Army Engineer District, Savannah

Corps of Engineers

Savannah, Georgia 31402

OBJECTIVE. To develop and operate a microfilm and half-size construction drawing system that will effectively serve the internal needs of the Corps of Engineers and be acceptable to the engineering-construction community.

BACKGROUND. The Army Corps of Engineers is the largest and most diversified engineering organization in the world. As the primary agency for engineering and construction, the Corps builds structures for the space program and national defense, as well as nationwide systems of civil works for flood protection, harbor development, and hundreds of other essential purposes.

The Savannah Engineer District is principally responsible for the maintenance and improvement of harbors, waterways, and civil works construction within its area of jurisdiction. The major work in support of these varied construction activities is that of engineering design. Responsibility for the district's reproduction of drawings and specifications rests with the Reproduction Branch of the Office of Administrative Services. This activity reproduces original drawings in both paper format and microform. Typically some 70–100 construction projects are supported each year, with each requiring about 80 architectural drawings and hundreds of pages of specifications.

The Reproduction Branch workload has doubled over the last 5 years. Because of this trend, coupled with new and improved capabilities offered in paper reproductions and microform methods, the district has been converting many of the old procedures to improved methods of information handling. Previously, a typical standard engineering drawing was produced on linen or paper and reproduced full-size on a blueprint, whiteprint, or diazo-type machine and distributed as required.

THE NEW METHOD. The system that is gradually being installed utilizes new techniques and equipment to better satisfy economic, operational, and user requirements.

The basic input to the system is construction drawings originated internally or by contract. These drawings facilitate prospective contract documentation by displaying the plan in a graphic form. Prospective contractors are given early notice of planned new construction, and those interested are sent "bid packages" for study and possible bid action.

In support of these contractor requirements, the original drawings are directly reproduced as full-sized or half-sized copies through use of an Itek platemaker and an offset press. The copy reproduction system has the added capability of duplicating the original engineering drawings for use as multicolor, line drawing overlays. For example, a construction drawing can show existing features in black; aboveground new construction in green; and belowground work in red. Thus, in a brief glance, a technician or engineer can readily distinguish between existing facilities and the new work to be accomplished.

After a construction contract has been awarded, the contractor has the choice of receiving one set of drawings in full-size format and an appropriate number of copies in half-size with color overlays.

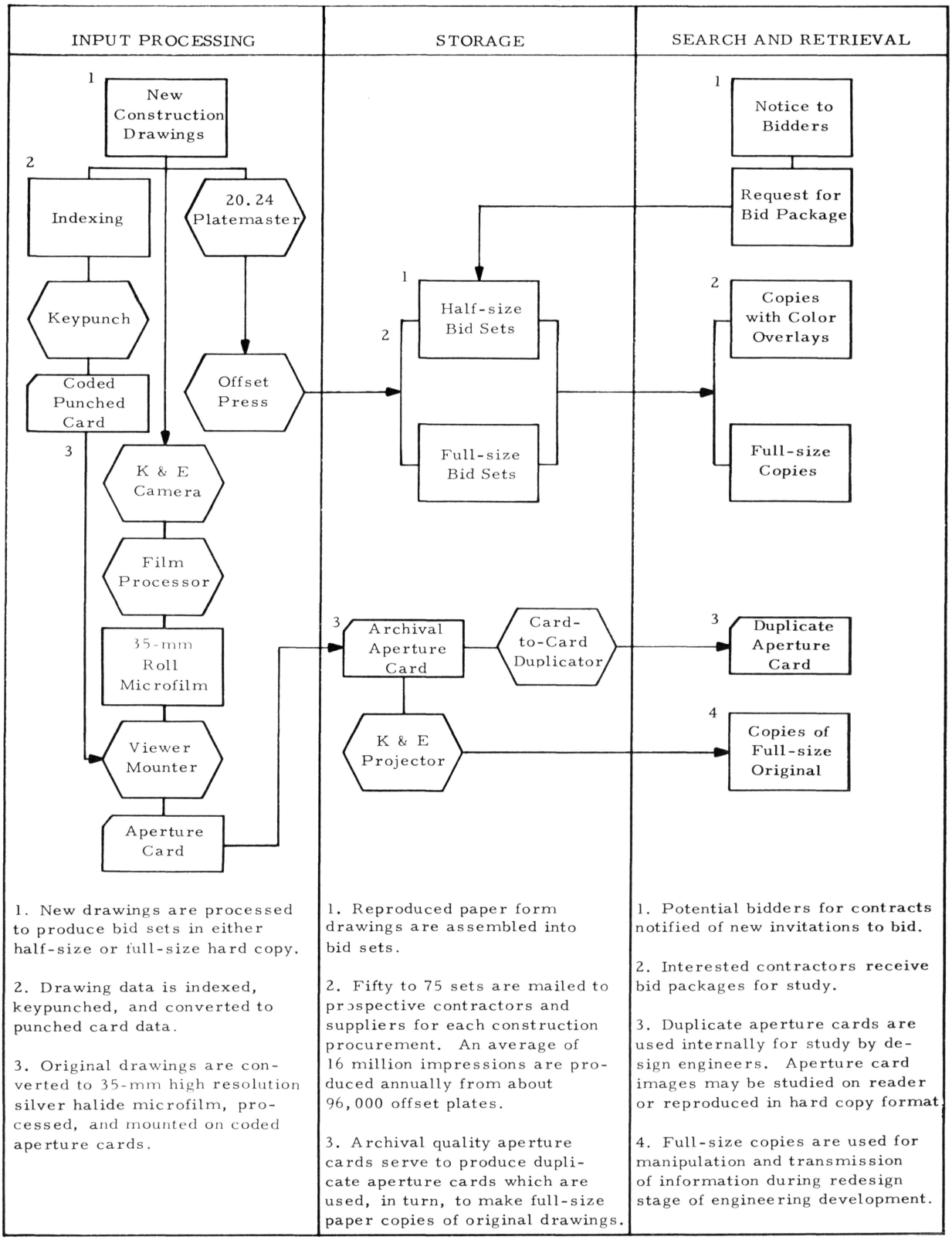
The original drawings are also used to produce archival-quality, 35-mm. silver halide, black-and-white microfilm for mounting on index-coded standard aperture cards. These aperture cards are then used to create duplicate aperture cards using a card-to-card duplicator device. These new sets of cards are used

internally to make full-sized, hard-copy, black-and-white engineering drawing images for manipulation and transmission of information during any redesign phase of existing engineering specifications.

REMARKS. The use of the Itek platemaker for satisfying contractor "bid set" requirements permits reduction of a drawing to half-size paper plates costing about 60 percent less than the full-size prints. This savings is especially significant in terms of a year's production under the half-size format. Some contractors still desire full-size copies, but their number is diminishing as they realize the greater adaptability, legibility, and multicolor advantages of the half-size format.

The use of microform for the reproducing of original engineering drawings is just beginning to be realized. For example, the camera used in such a system, when equipped with a projection or "blow-back" head, will project the archival-quality film image back onto a piece of sensitized drafting plastic and in so doing will reproduce the original drawing in full size. With eradicating fluids and ink, changes can be made on the reproduced drawings to create new originals. Thus this technique can be used to modify existing drawings, rather than having to prepare new ones.

ENGINEERING DRAWINGS STORAGE AND REPRODUCTION
(With Color Overlays)



1. New drawings are processed to produce bid sets in either half-size or full-size hard copy.

2. Drawing data is indexed, keypunched, and converted to punched card data.

3. Original drawings are converted to 35-mm high resolution silver halide microfilm, processed, and mounted on coded aperture cards.

1. Reproduced paper form drawings are assembled into bid sets.

2. Fifty to 75 sets are mailed to prospective contractors and suppliers for each construction procurement. An average of 16 million impressions are produced annually from about 96,000 offset plates.

3. Archival quality aperture cards serve to produce duplicate aperture cards which are used, in turn, to make full-size paper copies of original drawings.

1. Potential bidders for contracts notified of new invitations to bid.

2. Interested contractors receive bid packages for study.

3. Duplicate aperture cards are used internally for study by design engineers. Aperture card images may be studied on reader or reproduced in hard copy format.

4. Full-size copies are used for manipulation and transmission of information during redesign stage of engineering development.