

ORDER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
SOUTHERN REGION

SO 6083.1A

4/30/84

SUBJ: ENGINEERING DRAFTING POLICIES AND PROCEDURES

1. PURPOSE. This order provides direction to Airway Facilities personnel requiring Engineering Drafting Services.
- * 2. DISTRIBUTION. This order is distributed to Regional Airway Facilities Division, section level; Regional Logistics Division, section level; and all Airway Facilities Sectors and Sector Field Offices.
3. CANCELLATION. This order cancels Order SO 6083.1, Maintenance of Airway Facilities Drawings, dated December 11, 1981.
4. RESPONSIBILITIES.
 - a. Engineering Drafting Section. The Engineering Drafting Section shall provide drafting services for the Electronic Establishment Engineering Branch, Environmental Establishment Engineering Branch, Maintenance Program Branch, Program and Planning Branch, and the Airway Facilities Sectors. This section will be responsible for the indexing and filing of drawings/aperture cards, logging and assignment of drawing numbers, logging and assignment of specification numbers, maintenance of the data base referencing of drawings, stocking of specifications, and the printing of construction drawings by the use of the "Quantimatic" high speed printer.
 - b. Electronic Establishment Engineering Branch. The Electronic Establishment Engineering Branch is responsible for the development of electronic installation designs for the establishment and modernization of facilities under the F&E Program. Upon completion of a project, the responsible onsite engineer (work order carrier) will "redline" two sets of drawings. One set will remain at the site for reference and the other set will be forwarded to the parent regional Branch office. The design engineer will review the "redlines" and forward them to the Engineering Drafting Section. Each design engineer has responsibility for the initiation of designs that will use the most productive techniques available in the development of installation and regional standard drawings.
 - c. Environmental Establishment Engineering Branch. The Environmental Establishment Engineering Branch is responsible for the development of civil, mechanical, and electrical designs for the establishment and modernization of facilities under the F&E Program. Upon completion of a project, the responsible onsite engineer (resident engineer) will "redline" two sets of drawings. One set will remain at the site for reference and the other set will be forwarded to the parent regional Branch office. The design engineer will review the "redlines" and forward them to the Engineering Drafting Section. Each design engineer has responsibility for the initiation of designs that will use the most productive techniques available in the development of facility and regional standard drawings. *

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Initiated By: ASO-430

* d. Maintenance Program Branch. The Maintenance Program Branch is responsible for the development of electronic, civil, structural, mechanical, and electrical designs for projects funded under the Operations Budget. This branch will also be responsible for "redlining" two sets of all Operations Budget project drawings. One set will be furnished to the Engineering Drafting Section and one set will be retained at the site for reference. Each design engineer has the responsibility for the initiation of designs that will use the most productive techniques available in the development of facility improvement drawings.

e. Program and Planning Branch (Facilities Planning Section). The Facilities Planning Section of the Program and Planning Branch is responsible for the development of siting plans for navigational, communications, and radar locations, and responsible for initiation of plans that use the most productive techniques available in the development of the required drawings.

f. Airway Facilities Sector (Field Organization). The Airway Facilities Sector, Sector Field Office (SFO) and facilities are all responsible for maintaining up-to-date facility drawings that are essential to the effective maintenance and restoration of the facility. Drawings that are revised in the field should be done in a neat and orderly manner using red lines depicting all changes. One copy of the red-lined drawings should be forwarded through the Sector to the Maintenance Program Branch, ASO-460. ASO-460 will then forward to the Drafting Section.

5. BUDGETING, FUNDING, AND CODING.

a. F&E Funded Engineering Drafting.

(1) Budgeting. Engineering drafting manpower and associated costs must be included by the responsible program managers in the F&E budget estimates. The supervisor of the Engineering Drafting Section should be consulted when estimating drafting man-days, printing, and other drafting associated costs. Printing and supply costs for printing of construction contract or work order drawings should be listed as a separate line item under "drafting" in cost and budget estimates.

(2) Project Authorization. The Program and Planning Branch includes and identifies in project authorization documents, the authorized funding and man-days separately for environmental and electronics engineering drafting. The project authorization also identifies separately, funds for supplies, services, and printing of engineering drawings.

(3) Funding Control. F&E funds assigned for engineering drafting will be managed within authorized limits by the Supervisor of the Engineering Drafting Section. The job numbers to be used must be identified by the responsible engineer when requesting drafting services (See Appendix 3 - SO Form 1730-2). The overall responsibility to assure that engineering drafting is properly funded rests with the responsible engineering program managers. SO Form 1730-2 may be obtained from ASO-52C3 through normal supply procedures.

b. Operations Funded Engineering Drafting.

(1) Budgeting. Engineering drafting manpower and associated costs for the Airway Facilities Branches and Airway Facilities Field Offices will be included in the Electronic Establishment Engineering Branch Operations Budget. Branches will submit their requirements to ASO-430. Sector requirements will be submitted to the Maintenance Program Branch for consolidation prior to submitting to ASO-430.

- * In addition to manpower requirements, as noted in paragraphs 4 and 5, estimates will include supplies, services, printing, etc. Sectors should submit anticipated requirements to the Maintenance Program Branch.

(2) Authorization. The Program and Planning Branch allocates operations funds quarterly to the Electronic Establishment Engineering Branch for engineering drafting that is in support of maintenance engineering and other operations activities. The allocation identifies specific authorized levels for overtime, services, supplies, F&E on Operations, and other specific purposes as required.

(3) Funding Control. Engineers and others requesting drafting services must identify their project as to the cost center of the user of drafting services, special maintenance project (SMP) with project number or use of drawing. Operations funds assigned to the Electronic Establishment Engineering Branch will be managed by the Manager of the Branch based on budgeted requirements and authorization. Justification or justification with funding transfer may be required by organizations when requirements for drafting services were not preplanned.

6. ENGINEERING DRAFTING STAFFING. All staffing requirements for the Engineering Drafting Section based on projected F&E and Operations drafting workload will be included in the Electronic Establishment Engineering Branch staffing requests and authorizations.

7. ENGINEERING DRAFTING SECTION OPERATIONS AND PROCEDURES.

a. Responsibilities of the Regional Office Initiator of Services Required. The initiator is responsible for assuring that when he/she requests drafting services that requirements will not result in the development of a new drawing when an existing drawing or part thereof would suffice for the intended purpose. Also, that photographic processes can be used to the maximum extent possible for the development of the new required drawing. All requirements for the development of drawings by the Engineering Drafting Section are to be accompanied by a "Request for Drafting Services," SO Form 1730-2.

b. The Responsibilities of the Initiator at the Sector of Services Required. At the Sector level, revised drawings will be reviewed to prevent deviation from standards and to verify that drawings have been revised in accordance with plans and specifications. The drawings will then be forwarded to the appropriate branch.

c. The Responsibilities of the Engineering Drafting Section Supervisor. Upon receipt and review of the drawing request, it will be recorded in the Drafting Section Log. Prior to assigning the work to a draftsman, if the required work cannot be completed by the required date, the Supervisor of the Engineering Drafting Section will review the request to determine if the initiator has taken into consideration the use of existing standards and/or specific details used elsewhere in standards to minimize drafting efforts. The requirement to develop new drawings shall be challenged to determine if a regional standard will minimize drafting efforts now and in the future. Too, if the requested services can be met by the utilization of other drawings and/or parts of other drawings, the initiator will be advised and * the SO Form 1730-2 amended accordingly.

- * If the required work cannot be completed by the required date stipulated on SO Form 1730-2, the Drafting Section Supervisor will advise the requesting organization.

On completion of a drawing by a draftsman, it will be reviewed by the Engineering Drafting Section Supervisor and/or by the lead draftsman as to quality, adequacy, and time required to produce the drawing. Such information will be recorded on the Drafting Request, SO Form 1730-2.

d. Responsibilities of Draftsman. The draftsman is responsible for the quality and adequacy of the drawings and for coordinating with the requesting engineer to assure that the requirements are being met. Too, the draftsman has the responsibility, to the best of his/her knowledge, to assure that the request for drafting services has not placed a demand to develop a new drawing when another drawing exists containing details that will suffice for the intended purpose thereby minimizing workload demands.

8. UTILIZATION OF MICROFILMING EQUIPMENTS. The equipment listed below is to be utilized to the utmost to enhance productivity in the development of drawings and for printing hard copies of drawings.

a. 3M "2300" Processor Camera. The 3M "2300" Processor Camera microfilms engineering drawings and other documents onto 35mm film already mounted in aperture cards. It takes approximately 45 seconds to process. The camera will take drawings up to 34" x 44".

b. 3M Dupli-Printer. The 3M Dupli-Printer copies images from master aperture cards at a rate of eight cards per minute.

c. 3M "Quantimatic". The 3M "Quantimatic" is a high speed printer that produces enlarged paper (hard copy) prints of microfilm images mounted to aperture cards. Up to 200 aperture cards can be loaded at one time for single or multiple printing on ordinary bond paper, vellum, or paper printing plates.

d. 3M "624" Enlarger Printer. The 3M "624" Enlarger Printer is a manual card feed that prints the image from the aperture card onto hard copy prints up to 22" x 34" size "D" paper.

9. INDEXING OF DRAWINGS AND SPECIFICATIONS

a. Drawings. The system of indexing and control of drawings will be published in a separate order.

b. Specifications. The system of indexing and control of specifications will be published in a separate order.

10. FILING OF APERTURE CARDS. The original aperture cards will be filed in a separate secured place safe from fire, smoke, or heat damage. Only the duplicate aperture cards will be filed in the Drafting Section and used for printing purposes.

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* 11. DISTRIBUTION OF APERTURE CARDS AND HARD COPIES.

a. Active Aperture Cards. Those aperture cards which are designated in the data base as being in the active file will be kept in a separate physical location from the master file and consist of proposed additions or revisions to the master file. The active file will include a duplicate aperture card and a hard copy for each drawing to be added or changed.

b. New Standard Aperture Card. The new standard drawing aperture card may be added directly to the master file and the data base. Revised new facility drawings showing proposed facility changes will be retained in the active file until actual implementation of the change. The new drawing information will be added to the data base with designation that it is in the active file. After notification by the originating office that the facility change has occurred, the aperture card will be added to the master file and the active file designation removed from the data base.

c. Revisions. The aperture cards and duplicate cards for proposed drawing revisions showing a facility change will be retained in the active file until notification by the originating office that the facility change has been completed. The drawing revision data will be entered into the data base with the new revision date and the active file designation.

d. Upon notification of completion of the change, the master file aperture cards will be replaced by the revision aperture card. The old revision data will be deleted from the data base and the active file designation removed from the new revision data. An updated facility index will be issued with the duplicate cards when they are distributed.

e. Deletions. When a facility change has been implemented which permits the deletion of a drawing, the aperture card will be deleted from the master file and the drawing data removed from the data base.

f. It will be incumbent upon the originating engineer to assure that all work on a drawing is coordinated and no duplications or conflicting changes occur on a drawing or drawings. The engineer must notify the Drafting Section with a form letter that the additions, revisions, and/or deletions can be placed in the master file and the data base revised and hard copy discarded. The form letter will be circulated to the other sections in Electronic Establishment Engineering Branch, Environmental Establishment Engineering Branch, and Maintenance Program Branch for coordination prior to forwarding to the Drafting Section. If a drawing remains in the active file longer than 6 months, a form letter will be sent to the originating office to review the status of the drawing. Unless otherwise advised, within one month of the date of the form letter, the drawing and aperture cards will be returned to the originating office and the drawing data will be removed from the data base.

g. Master aperture card will be retained by Engineering Drafting Section. No distribution will be made. *

* h. Duplicate aperture cards (duplicard) or one-half size drawings (hard copy) will be issued by the Engineering Drafting Section as requested by authorized personnel. Authorized personnel shall complete a request for printing service (GSA Form 50). A log will be maintained to record such distributions.

i. Extra hard copies will be issued by the Engineering Drafting Section as requested by authorized personnel. Authorized personnel shall complete a request for printing service (GSA Form 50).

12. PRINTING OF CONSTRUCTION CONTRACT DRAWINGS. Procedures for printing, handling, distribution and reprinting on construction contract drawings are as follows. All construction contract drawing sets will be printed on the Quantimatic printer unless other method of reproduction is justified and specifically requested by the Contracting Officer or responsible engineering organization.

a. Preparation. Prior to printing of any construction drawings, the project engineer will provide the project draftsman complete listing of all drawings for the job. Correctness of drawing titles, numbers and latest revision date shall be verified by the draftsman. Correction of the drawing list is the responsibility of the project engineer.

b. Initial Printing.

(1) Upon proper review and signing of all project drawings the project engineer shall advise the Secretary of the Drafting Section that the construction job is ready for printing. The Secretary of the Drafting Section will obtain the number of construction sets required to be printed for contract distribution from the Procurement Assistant in the Construction Contracting Section and additional number of sets required from the appropriate project engineer for distribution to Airway Facilities Sector, airport sponsors, etc.

(2) The drafting file clerk will prepare a duplicate set of aperture cards based on the list of project drawings required. Construction contract drawing sets ("books") will be printed from this duplication set of aperture cards. Upon completion of printing, this complete set of duplicate aperture cards together with the required drawing sets will be reviewed for quality by the Supervisor of Drafting Section and delivered to the Construction Contracting Section.

c. Reprinting. Additional construction contract drawing sets that are required for solicitation of bids will be printed upon request from Procurement Assistant in the Construction Contracting Section to the Secretary of the Drafting Section. The duplicate set of aperture cards will be returned to the Drafting Section with each reprinting request and delivered back to the Construction Contracting Section upon completion of the requested reprinting. Reprinting operations have priority in the printing process over initial printing.

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- * 13. AIRPORT LAYOUT PLAN. The Planning Section of the Program and Planning Branch has the primary responsibility for currency and distribution of airport layout plans. Generally, upon receipt of an approved revised airport layout plan, aperture cards will be promptly made and duplicate cards for use and reference will be available at the responsible organization and in the Engineering Drafting Section file room. The accuracy of airport layout drawings in the Airway Facilities Division published book of "Airport Layout Drawings" will be reviewed during October of every year and revised pages (drawings), if warranted, issued in January of each year, unless special issuance is warranted.
14. AIRPORT GENERAL PLAN. The Planning Section of the Program and Planning Branch has the primary responsibility for preparation, maintenance of currency and distribution of the general plans. This plan will depict actual commissioned facilities and indicate general location of facilities that are considered in the Region's long range plans. Procedures for filing and reviewing are concurrent and the same as those for airport layout plans, except books will not be issued and the Environmental Establishment Engineering Branch is responsible for verifying the location of every new facility on the general plan prior to joint acceptance inspection of the new facility. Scale of the general plan is usually the same as the airport layout plan. Cables and underground utilities usually are not depicted on this plan.
15. AIRPORT UTILITIES DRAWINGS. The Planning Section of the Program and Planning Branch has the primary responsibility for coordination with sponsors and keeping current airport utilities drawings. The utilities drawings also depict existing and planned cable ducts for agency and other use and therefore are considered one of the key airport planning drawings. Procedures for filing and reviewing are concurrent and the same as those for airport layout plans, except books will not be issued. Scale of the airport utilities plan usually is the same as the airport layout plans.
16. CABLE LAYOUT PLAN. Cable layout plan will be maintained on every airport that has two or more agency owned or maintained facilities on airport property.
- a. Preparation of cable layout plans shall be as follows:
- (1) The initial cable plan or cable plan revised by an F&E project will be prepared by the Environmental Establishment Engineering Branch during engineering design of facilities on the airport. This plan will be verified during preparation of "as-built" drawings and accuracy of this plan is maintained as further defined in this directive.
- (2) The revised cable layout plan or complete updating of the cable plan, except for F&E projects, will be prepared by the Environmental Engineering Section, Maintenance Program Branch, with coordination and assistance with local Airway Facilities Sector.

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* b. Cable Layout Plan Record Maintenance. The airport cable layout plans shall be kept current by indicating planned and "as-built" cable installations. The organization that performs the engineering of cable installation or relocation is responsible for revising the cable plan by indicating the planned installation and approximate year of installation. The organization that performs the construction management aspects of cable installations is responsible for indicating "as-built" condition on the cable plan. In cases where cables to FAA facilities are installed or relocated by others, such as airport sponsors, then the initial changes to the cable plan will be made by the Federal Aviation Administration organization that authorized the changes and the "as-built" drawings prepared by the organization that accepts the cable relocation in the field.

c. Format of Cable Layout Plan. The basic cable layout plan shall be on the same scale as airport layout plan to permit easy referencing, coordination and to avoid unnecessary drafting. Specific congested areas on the airport may not be clearly depicted in the basic cable plan; therefore, as many detail plans as are required for proper clarification in the congested areas should be prepared on separate "D" size drawings and properly cross-referenced on the layout plan. Standard prescribed symbols as described in the Drafting Standards should be used for all drawings.


J. Stiglin
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Appendix 1

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APPENDIX 1. DRAFTING PRIORITY CLASSIFICATIONS

Priority "1", Work in Progress, such as changes to construction contracts that are in progress, changes to electronic installation drawings when installation is in progress, drawings required to provide guidance to correct problems on equipment at operating facilities when "trouble-shooting" is in progress.

Priority "2", Obligations and Commissioning Goals. Drawings required for contracts (SMP, Operations and F&E funded) that have funding obligation commitments or obligation time limits. Drawings for projects that have accelerated or critical commissioning schedules.

Priority "3", Construction, Installation and Modifications. Drawings required for construction, installation or modification of facilities. (Usually new or revised drawings, unless higher priority is justified by responsible Branch Managers or Section Supervisors.)

Priority "4", As-Built and Records. Drawings required for facilities "as-built" and other records or improvement of record drawings.

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APPENDIX 2. GLOSSARY

Active File. Duplicate aperture cards showing proposed additions and revisions to master aperture cards. Hard copies are considered part of the active file; however, they are not stored in the same physical location.

Airport General Plan. Drawing of the airport that depicts FAA facilities, existing and planned. This drawing is usually developed from the sponsor's airport layout plan, emphasis is on current conditions and near term developments. Drawing has FAA title block and drawing number.

Airport Layout (Master) Plan. Drawing of airport and some adjacent area prepared by airport sponsor or its consultant. The drawing depicts existing and planned future airport development. Drawing does not have an FAA title block or drawing number.

Airport Utilities Drawing. Drawing of the airport that depicts duct banks, runway and taxiway lighting cables, water lines, sewer lines, underground powerlines and other underground installations on an airport. This drawing usually does NOT include FAA underground cables.

Aperture Card. A 7-3/8" x 3-1/4" computer processing type card with 35 millimeter (1-1/4" x 1-3/4") film image of a drawing mounted in the card.

a. Master aperture card - the aperture card with the original photograph of a drawing.

b. Duplicate aperture card - a second microfilm copy of the master card to be used to make hard copies.

As-built drawings are drawings which reflect the actual configuration of the facility/equipment. The standard Electronic Establishment Engineering installation drawings shall constitute the "as-built" drawings when there are no changes to the standard.

Cable Layout Plan. Drawing of the airport that depicts all FAA underground cables on an airport. Included are also cables shared with other agencies, such as the National Weather Service, and cable to facilities maintained or owned by the agency, such as power company installed underground cables.

Data base includes all master file and active file drawing data consisting of drawing status, ATC location, drawing number, drawing type, facility type, runway drawing title, last revision date, originating office, geographic location, and responsible AFS.

Drawing Status. Indicates where the aperture card is filed--in the master file or active file.

Facility Drawing Index. Complete listing of drawings, environmental and electronics, of a facility. This index includes station and various standard drawings. Also, references of tenant facilities.

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Hard Copy. Any reproduction of an engineering drawing, full or reduced size, on paper, such as blue line, lithographic print, etc.

Host Facility. The original facility such as a VOR, RCAG, RT or radar that houses equipment or has on its plot another facility, such as BUEC, DF, RCO or other facility. For drafting/filing purposes, a host facility is also a facility from which electric service is provided to another facility.

Index of Drawings. Complete listing of drawings in Drafting Section files.

Master File. Aperture cards of Washington standard; regional standard; and all facility drawing cards showing as-built facility conditions.

Medium. The type of material (paper, film, etc.) used for placing images or pertinent data.

Microfilm. A fine grain, high resolution film containing an image or images greatly reduced in size from the original. Part of an aperture card.

Microfilm Cards. Same as aperture card. See aperture card.

Mylar. A permanent film base reproducible, usually .004 inches thick and matted on both sides. This medium may be produced by the photographic or the direct-contact diazo method.

Reader (Viewer). A projection device used to enlarge the image on the aperture card for reading purposes only.

Reduction Ratio. A measure of the number of times a given linear dimension of an object is reduced when microfilmed, expressed as 16X, 24X and 30X.

Redlined drawings are standard or site peculiar drawings which reflect a field change made with red lines to comply with an approved change. Normally, these redlined drawings are returned to the Regional Office for updating of the original.

Sepia. A temporary paper form of reproducible (low grade).

Site peculiar drawings, see "station drawing."

Standard drawing is a drawing that is used for the installation or construction of typical facilities, usually at several locations. These may be national standards issued by Washington, national standards regionally adapted, or regional standards developed by the appropriate engineering branch. Location names will not be used on standard drawings.

Station Drawings. Engineering drawings specifically developed for a location, such as site drawings; location identified by name of city and state on bottom line of drawing title block.

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Appendix 2

* Tenant Facility. A facility that has been added to an original facility and shares building space and/or the plot with the basic facility, such as a BUEC at radar, DF at RR, RCO at VOR. For drafting/filing purposes, a tenant is also a facility that obtains electric service from another facility, such as RVR (transmissometer) from ILS GS. *

APPENDIX 3

SAMPLE
REQUEST FOR DRAFTING SERVICES

PART I - TO BE COMPLETED BY PROJECT ENGINEER

Facility or Project

Atlanta, Ga, ILS

Date Work Required

6/20/84

- Prepare new vellums.
- Revise Vellums of enclosed drawings.
- Return new or corrected vellums to project engineer for review/signature.
- Furnish sepia of each vellum to project engineer.
- Assign new station drawing numbers.
- Furnish _____ prints of each vellum to project engineer.

Special Instructions:

Charge Drafting to: <input checked="" type="checkbox"/> F&E <input type="checkbox"/> OPNS	Appropriation <i>582.0/78031/441/30694</i>	Total No. Vellums <i>10</i>
Charge Printing to: <input type="checkbox"/> F&E <input type="checkbox"/> OPNS	Appropriation	Total No. Vellums
Requested by (Project Engineer) <i>John Doe</i>	ASO - <i>433.40</i>	Date <i>5/1/84</i>

PART II - TO BE COMPLETED BY DRAFTING SECTION

Drawing ID Number Drafting Charges - Class 6 Printing Charges - Class 3

Work Accomplished by _____ Date _____

Charges Approved by (signature) _____

Completed work received by (signature) _____ Date _____

Remarks:

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APPENDIX 4. AIRWAY FACILITIES FIELD MAINTENANCE OF ENGINEERING DRAWINGS

1. PURPOSE. This appendix provides instructions and lists minimum requirements for retention, distribution, revision, filing and indexing engineering drawings at the Airway Facilities Sector level, Sector Field Office (SFO) level and facility level.
2. GENERAL. Prompt access to facility drawings is essential to effective facility maintenance and restoration. In addition, drawings must be current and available at all levels of need to avoid confusion and costly mistakes when maintaining, restoring, modifying, modernizing, adding to or replacing a facility. All facilities shall have, where applicable, facility drawings which include the following information:
 - a. Air traffic control position console layout.
 - b. Equipment room floor plan including wall-mounted equipment.
 - c. Equipment rack layout including wall mountings.
 - d. Antenna layout.
 - e. Tabular wire lists (termination drawings).
 - f. Audio, control, video, data and RF distribution.
 - g. Mechanical (HVAC, E/G, plumbing, fuel system, etc.).
 - h. Airport general plan and cable layout drawings.
 - i. Site plan or plot layout.
 - j. Electrical distribution.
 - k. Lightning protection.
 - l. HVAC control diagrams.
 - m. FAA demarc box layout.
3. DISTRIBUTION OF DRAWINGS. As a minimum, distribution of drawings shall be as follows:
 - a. Sector Headquarters - One copy on microfilm of all engineering drawings applicable to facilities assigned to the Sector.
 - b. Co-located Sector Field Office - One hard copy of all engineering drawings applicable to facilities assigned to the SFO.
 - c. Non Co-located Sector Field Office - Same as co-located SFO.
 - d. Facility - One hard copy of all engineering drawings applicable to that facility.

Copies of engineering drawings greater than those specified above can be provided but must be requested by the Sector Manager.
4. RETENTION. With the exception of facilities that do not have available space, all facilities shall have at least one copy of the most recent revision of all applicable engineering drawings. For those facilities with space limitations, the Sector Manager or his designee shall provide and post a list of the applicable drawings and where they are located. For dual facilities there is no intent to require duplicate drawings. For example, common drawings equally applicable to a TACR and VOR should be listed with the VOR.

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5. FILING AND INDEXING OF DRAWINGS AT FACILITIES AND SECTOR FIELD OFFICES.
Drawings shall be filed in a manner that they can be retrieved easily.

6. REVISION. As noted in paragraph 2, current drawings are essential for effective maintenance, engineering and restoration. Consequently, physical changes to facilities must be quickly annotated (redlined) on facility drawings and submitted through Maintenance Operation Branch for revision. Only functional changes need be made. In this respect, a functional change is one that affects facility operation or one that could mislead one to make an erroneous engineering decision. Consequently, only minor redlined corrections, such as data block entries, etc., are acceptable as drawings that will not require revision. Extra copies of drawings, reduced or full size, can be provided by the Engineering Drafting Section upon request for the purpose of making redlined corrections. *

APPENDIX 5. CAEG SYSTEM DEVELOPMENT OR MODIFICATION OF ENGINEERING DRAWINGS

1. PURPOSE. This Appendix establishes the procedures and guidelines for the CAEG System.

2. BACKGROUND. In October 1984, the Southern Region took part in a test to determine the feasibility and economics of using a CAEG System for handling engineering and facility drawings. This test proved the economics of the system and agency plans are now to use CAEG as the agency standard for developing drawings. Although the CAEG System is economical, a program was not developed to transition all drawings from the previous hard copy drawing to CAEG drawing tapes. Funding for modifications to existing drawings was requested for making changes, not to redraw the complete drawing on CAEG. Therefore, funding is not available to transition these drawings into the CAEG System.

3. POLICY. The following policy guidance shall be used until such time that a program is funded to provide for all drawings to be accomplished using CAEG:
 - a. New Drawings. All new drawings (assuming funding is adequate) shall be developed using CAEG. Funding required for development of any new drawing should be less using CAEG than by conventional drafting methods.

 - b. Modifications to Existing Drawings. Modifications to existing drawings (drawings not in the CAEG System) shall be accomplished by conventional drafting methods unless the Engineering Services Section states that the changes can be accomplished using CAEG at a lesser cost.

 - c. New Systems/Facilities in Brown Book. All drawings on new systems, equipment or facilities should be new drawings and should be accomplished using CAEG.