

CEMP-EC Engineer Regulation 415-345-38	Department of the Army U.S. Army Corps of Engineers Washington, DC 20314-1000	ER 415-345-38  30 June 2000
	Construction  TRANSFER AND WARRANTIES	
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CEMP-EC

DEPARTMENT OF THE ARMY  
U.S. Army Corps of Engineers  
Washington, DC

ER 415-345-38

Regulation  
No. 415-345-38

30 June 2000

Construction  
TRANSFER AND WARRANTIES

1. Purpose. This regulation prescribes U.S. Army Corps of Engineers (USACE) policy and procedures for the transfer of completed construction projects and for implementing warranties. Recommended changes to this regulation should be forwarded to CEMP-EC.
2. Applicability. This regulation applies to all HQUSACE elements commands having any type of military, civil works, or support for others design and construction responsibilities.
3. Distribution Statement. Approved for public release, distribution is unlimited.
4. References
  - a. AR 405-45, Inventory of Army Real Property
  - b. AR 415-15, Army Military Construction Program Development and Execution
  - c. AFI 32-1023, Design and Construction Standards and Execution of Facility Construction Projects
  - d. ER 5-1-11, Program and Project Management
  - e. ER 25-345-1, Systems Operation and Maintenance Documentation
  - f. ER 415-345-13, Financial Closeout
  - g. ER 1165-2-131, Local Cooperation Agreements for New Start Construction Projects
  - h. EP 715-1-7, Architect-Engineer Contracting
5. General.
  - a. It is essential that USACE maintain customer support through project transfer and the respective warranty period. The specific details of the transfer and warranty procedures

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This regulation supersedes ER 415-345-38 dated 31 January 1993

contained in this regulation will vary depending on the customer; therefore, the guidance should be modified as necessary to provide the support appropriate for the customer. Customer desires to do with warranty options, training of personnel, extended support by USACE, and details related to administrative and technical acceptance of a completed facility must be taken into account early in the planning stages of a project. Following actual turnover of a completed facility for operation and occupancy, the responsibility for investigation of potential warranty problems belongs to the customer, however, USACE advice and assistance should remain available in problem resolution. Optional reimbursable support by USACE to handle construction warranty issues in their entirety on a reimbursable basis may be discussed with the customer if it is practicable within staffing constraints.

b. A written Memorandum of Understanding (MOU) which defines responsibilities and procedures to follow during transfer of facilities and during all warranty periods will be established by the USACE Construction Agent (CA) for each customer. The CA is the district office which is responsible for construction contract execution. The USACE District Commander should be party to the general MOU with the supported customer. A sample generic MOU which outlines many of the points to be included is at Appendix A to this regulation. A project specific MOU is recommended for large or unique projects. For Civil Works projects with a Project Cooperation Agreement (PCA), transfer and warranty procedures should be addressed in that agreement. For other Civil Works projects where the Corps will operate and maintain the facility, appropriate procedures for transfer and warranty enforcement should be established in general accordance with this regulation.

c. Service to the customer involves a total USACE team effort from cradle to grave during project execution. The USACE Project Manager has the primary responsibility for insuring that customers understand the implications of decisions to do with warranty before inclusion in the contract specifications. Options to do with construction warranty must be presented and discussed with the customer in the planning stage for the project. The project manager and the designer must address the various aspects of warranty with the customer at that time, and subsequently, at each step of design development, in order that those special requirements can be incorporated into the contract documents. Warranty will be addressed in the Project Management Plan (PMP) when the requirements are developed. Some items and services may require additional funding by the customer, or may not be covered by project S&A; therefore, early discussions will allow for programming of funds.

d. The most common warranty options for the customer to consider include commissioning of heating, ventilation, and air conditioning (HVAC), and other complex facility systems, operation and maintenance of the facility by the construction contractor, specified warranty response times on selected facilities, extended warranty, and reimbursable services of the Corps to investigate and manage the correction of warranty problems. It is strongly advised, that in the case of any sizable facility, a warranty management plan be specified. The plan should require the contractor

to provide a summary book of all required actions and documents to insure that the government receives the benefit of all warranties to which it is entitled. Reference should be made to Corps Guide Specification CEGS-01780, Closeout Submittals, which outlines several additional items which should be considered for inclusion in the contract documents.

e. The subject of warranty responsibilities should be an agenda item at the preconstruction and partnering conferences on all projects. A separate meeting between the contractor, customer, and USACE personnel immediately prior to project turnover to specifically discuss warranty responsibilities in the post construction period is highly advisable.

## 6. Policy.

a. The Warranty of Construction Clause (FAR 52.246-21) should be utilized in all construction contracts unless its use is clearly inappropriate for a particular contract. The clause provides for a one-year construction warranty from the time of project acceptance from the construction contractor. Upon notification by the customer that the contractor will not meet the warranty requirement, the CA will assume primary responsibility to evaluate and obtain correction of defects.

b. The transfer of construction to the customer will be simultaneous with the acceptance of that construction from the contractor. Unless agreement has been made for partial beneficial occupancy, only facilities which have been completed according to contract requirements, or substantially completed with minor deficiencies which will not interfere with the designed use of the facilities, will be accepted from the contractor and transferred to the customer. Transfer documents will be executed and warranty information will be furnished to the customer at time of physical transfer of the completed facility, or part thereof.

c. The same transfer procedures followed for the transfer of a completed project should also be used in the case of phased transfer. For phased transfer, the required transfer documents may not be in final form. However, all technical documents and supporting training of personnel required for safe and effective operation of the facility shall be provided to the customer before the facility is occupied. If a facility is to remain vacant for an extended period prior to occupancy, it may be prudent to plan for the construction contractor to maintain the completed facility, and specify a warranty period which begins at occupancy. The CA will give the customer advance written notice at least 14 days before the anticipated completion date and arrange for a joint inspection with representatives of the contractor, the Director of Public Works/Base Civil Engineer (DPW/BCE), the customer and appropriate command representatives. Prior to the Joint Inspections (called "Final Inspections" by Air Force), the CA will assemble the proper documents as outlined in Appendix B of this regulation.

d. Joint Inspection.

(1) Representatives duly authorized to act for the Contracting Officer, the contractor, and customer will participate in the Joint Inspection. As appropriate, representatives of the appropriate command will also be encouraged to participate.

(2) The transfer document (DD Form 1354 for Military Construction) certifying completion of the work, except for known deficiencies listed on the documents, will be furnished by the CA to the customer at the time of inspection. This interim document will be updated upon actual financial close out of the project, and the final form of the summary will be provided to the customer. Any further minor deficiencies disclosed during the inspection will normally not be justification to delay transfer. The customer will accept the facility by signing the transfer document. Normally, the document should be signed at the time of the joint inspection. Facilities will not be physically occupied by the customer until the transfer documents are signed.

(3) Inspection and transfer of work performed for other government agencies will be generally as outlined above except that the transfer document will be as determined by agreement of both parties in the MOU.

(4) Following the Joint Inspections, the CA will list and classify all deficiencies as either contract deficiencies or outside the scope of the contract, which the customer believes should have been provided. Not later than 14 calendar days following the joint inspection, the CA will provide this classification to the customer in writing along with the plan of action for correction of each deficiency. This plan should be coordinated with the customer prior to actual transfer, so as not to delay turnover and use of the facility. If the CA cannot correct a deficiency, it will be so stated in the plan. The plan will include a schedule for correction of the deficiencies and will address the funds needed for correction. Once all construction deficiencies have been corrected, the CA and the customer will acknowledge corrections by initialing the transfer document. A list of construction completion documents to be furnished to the customer, along with timeframes to facilitate an orderly transition for operation and maintenance is attached to this regulation at Appendix C, and details of as-built drawing delivery is at Appendix D.

7. Contractor Performance Evaluation. When less than satisfactory performance is noted with regard to the warranty requirements of the contract, the contractor performance evaluation must document that requirements were not fulfilled. The performance evaluation should reflect warranty activities as of the time of the evaluation. Contractor responsibilities continue through the specified warranty period, and must be taken into account.

a. At the time of transfer of the constructed facility to the customer, the resident/area engineer should inform the contractor of the continuing contract requirements noted in the contract regarding the warranty provisions, and any special response or corrective measures that need to be implemented by the contractor during the one-year period or beyond. The contractor

should be notified that his/her performance on resolving warranty problems during this period will be monitored, and that if performance is not satisfactory, a revision to the contractor performance rating will be issued.

- b. If the contractor is non-responsive or performing marginally during the warranty period, a revised DD Form 2626 will be initiated and submitted for entry into the Construction Contractor Appraisal Support System (CCASS). The revisions should normally include appropriate changes which will document the poor performance. The revised evaluation will reflect appropriate changes to Part III of the form, dealing with the section Evaluation of Performance Elements. Specifically, the ratings for the following elements should be reviewed and revised as appropriate to correspond with the level of performance achieved:

- (1) Part 15; Quality Control; Item k, Identification/Correction of deficient work in a timely manner.
- (2) Part 16; Effectiveness of Management; Item g, Warranty Response.
- (3) Part 17; Timely Performance; Item g, Warranty Response.

c. When the overall performance rating is revised to either Marginal or Unsatisfactory, then Part 20; Remarks, must be completed to explain the specific warranty problems which have caused the revision. This section is especially important, since the change in rating must be communicated to the contractor, and serves to explain the rationale for a lesser rating.

d. Another key area to address during the warranty period is the satisfaction of the customer. Two joint inspections with the customer are performed after transfer of the facility to identify any warranty issues or defects. As part of this final warranty inspection, the customer should be requested to provide input on the contractor's performance and responsiveness to warranty problems. The contracting officer's representative should evaluate the end user comments to determine if the contractor reasonably tried to meet the customer's demands within the contract requirements. Documented input from the customer will be used to augment any performance based problems attributable to the contractor.

#### 8. Warranty Period Procedures.

a. Normal procedures for construction projects for the Army on Military Construction Army (MCA) funded projects follow:

(1) When a defect is discovered, the DPW responsibility is to determine whether the defect results from user abuse, improper operation or maintenance, design or construction problem. This initial determination may require the assistance of the CA when there is doubt as to the

construction contractor's liability. If the defect is the responsibility of a contractor, efforts to obtain correction must initially be made through the avenues provided by the contract by the user/facilities manager. Immediate notification will be made to the contractor on defects of a critical nature, i.e., defects that affect operations, habitability of living spaces, life safety, or the physical security of the property. The notification will require that the contractor provide an adequate response with the proper diligence, and according to the terms of the contract concerning response times. If the contractor fails to commence with the warranty work, the CA should be contacted to help promote action. A list of non-critical defects should be maintained by the using agency and the DPW and presented when practicable or at the four-and nine-month warranty inspections. Defects that are found to be the result of user abuse or improper operation or maintenance are the responsibility of the customer. If there is a controversy over the cause of the defect, it will be resolved by the Contracting Officer. All USACE administrative costs resulting from warranty enforcement are chargeable to Supervision and Administration (S&A), and should be appropriately managed by the USACE project manager to insure support to the customer. Any additional reimbursable services should be arranged and outlined in the MOU for the project.

(2) Procedures for typical defects are listed below with the responsible office and funding source (other than administrative cost) already aforementioned. In all of the cases, the project manager needs to be kept apprised of warranty actions, so as to take the lead in coordination with the customer to correct the identified deficiencies by the most expedient means possible, especially with regard to the resolution of any funding questions. The customer must ultimately decide whether to pursue correction by the construction contractor. This is a business decision which must be made by weighing funds required against the likelihood of recovery, and whether the corrective action will be taken in a timely manner to satisfy the needs of the customer.

(a) For construction deficiencies covered by a contract warranty, the initial contact with the contractor, vendor, or manufacturer to obtain correction will be made by the DPW unless modified by the written MOU. If the customer's efforts to solve the problem through direct contractor contact are unsuccessful, the customer should contact the CA for further action.

(b) For design deficiencies covered by an architect-engineer (A-E) contract clause, upon identification, the CA will obtain correction, and where appropriate, take action to recover costs in accordance with EP 715-1-7.

(c) For design or construction deficiencies not covered by a contract clause or warranty, upon identification and evaluation, the CA will obtain correction, using appropriate project funds.

(d) Defects in Government Furnished Property (GFP) installed by the construction contractor. Procedures similar to those explained in subparagraph (a) above will be used when a GFP item is covered by the construction warranty. For items not covered by that warranty, or if

the warranty has expired before the end of the first year after facility transfer, the CA will obtain correction by using appropriate project funds.

b. Construction For Other Than Army MCA Funded Projects. The same procedures will be followed as explained above for MCA funded projects except that correction by the CA of defects listed in subparagraphs (c) and (d) above will depend upon funds being provided by the customer/user.

c. Warranty Inspections. At approximately four months and nine months after transfer, the CA and customer will perform joint inspections to identify defects and plan corrective actions. The contractor should be represented at these warranty inspections in order to attain an understanding of the problems and proposed solutions. The CA will contact the customer prior to these inspections for a list of work orders on the facility. The list will be used to help identify defects. Special attention will be given to the quality of the roofing systems at the nine-month inspection. The CA will establish a suspense system to ensure the inspections are scheduled and conducted.

d. Repair Of Items Under Warranty. The policy regarding items repaired under the warranty clause is that the one-year warranty is not extended. For illustration purposes, if the item is repaired on the last day of the warranty period, the warranty expires on the next day, despite the new repair/replacement. It is therefore prudent to allow for a break-in period on repairs, in order to insure the operability of the repaired item before warranty expiration.

9. USACE Actions on Behalf of Customers Beyond the Warranty Period. All necessary actions shall be taken by the USACE District to recover the cost of defects from the contractor or design firm when they are deemed responsible. Neither acceptance of a facility by the government nor the end of the warranty period ends the contractor's, manufacturer's, or supplier's liability for defects of a latent nature. However, the burden of proof to establish failure due to the latent defect falls on the government. As soon as a latent defect is suspected, the customer should contact the CA and a joint inspection should be held. If the contractor responsible for the warranty or latent defect refuses to perform or is no longer in business, the CA will notify the surety that furnished the required performance bond for the construction contract, or other optional bonding instruments. The CA will pursue warranty corrections with the surety as well as the contractor until all warranty defects have been corrected.




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FOR THE COMMANDER:

4 Appendices

APP A - Generic Memorandum of  
Understanding with Customers  
APP B - Joint Inspection Checklist  
APP C - Delivery of Construction Documents  
APP D - As-Built Drawings



RUSSELL L. FUHRMAN  
Major General, USA  
Chief of Staff

## APPENDIX A

### GENERIC MEMORANDUM OF UNDERSTANDING

## SAMPLE MEMORANDUM OF UNDERSTANDING

DIRECTORATE OF PUBLIC WORKS / BASE CIVIL ENGINEER  
& U.S. ARMY CORPS OF ENGINEERS - AT FORT \_\_\_\_ / \_\_\_\_ AFB

### TRANSFER AND WARRANTIES OF COMPLETED CONSTRUCTION

1. **PURPOSE:** The purpose of this memorandum is to outline established policies for transfer of completed facilities, to describe working relationships in carrying out warranty enforcement and to ensure a timely response to warranty related problems following construction of facilities.
2. **REFERENCE:** ER 415-345-38, Transfer and Warranties
3. **POLICY:** The transfer of construction from the USACE District Office to the Directorate of Public Works (DPW) / Base Civil Engineer (BCE) will be simultaneous with the acceptance of construction from the contractor unless otherwise specifically stated. Only facilities which have been completed according to contract requirements, or substantially completed with minor deficiencies not interfering with the intended use of the facility, will be accepted from the contractor and transferred to the DPW/BCE. For Civil Works projects, details of transfer and warranty will be addressed in the Project Cooperation Agreement.
4. **PROCEDURE:** The following is an outline of key procedures by project phase which should be followed to insure good management of warranty issues:

A. Project Design Phase: The project manager and the designer will explain the warranty options available to the customer early in the design process, in order that those special requirements can be incorporated into the contract documents. Some items may require additional funding by the customer, and early discussions will allow for proper programming of monies. The most common options include commissioning of HVAC and other complex systems, O&M of the facility by the contractor, extended warranty, and Corps warranty management services. It is strongly advised, that in the case of any sizable facility, a warranty management plan be specified, which requires the contractor to provide a summary book of all materials relating to all warranty information, at the time of transfer. Corps of Engineers Guide Specification CEGS-01780 contains a sample contract clause which outlines the requirements of such a plan.

B. Construction Phase: The DPW/BCE will be:

(1) Invited to attend and participate in the Preconstruction Conference held by the USACE District Office prior beginning construction.

(2) Invited to participate in the Partnering process.

(3) Invited to visit the construction site(s) at any time with an escort from the USACE District Office.

(4) Notified of the schedule of customer training required to be presented by the contractor.

(5) Invited, upon substantial completion of the facility, to a Pre-Final Inspection where a deficiency list for the facility will be compiled. The DPW/BCE will be notified of the scheduled inspection in order to plan attendance. The Quality Assurance Representative responsible for the project will monitor correction of deficiencies and annotate the resulting deficiency list as to the date each item is corrected.

(6) Responsible for inviting the end user to the Pre-Final Inspection.

(7) Invited to participate in any commissioning of building systems which are included in the project, to include testing and balancing, and performance verification.

C. Project Transfer: Draft DD Form 1354 will be coordinated with the DPW/BCE prior to the Pre-Final Inspection and a draft document will be presented the DPW/BCE representative in conjunction with the Joint Inspection. Final Documents: In conjunction with the Joint Inspection/Substantial Completion/Acceptance of the facility (or at a later time as noted below), the following documents will be provided to the DPW/BCE:

(1) Physically Complete DD Form 1354, Transfer and Acceptance of Military Real Property, with annotated list of remaining deficiencies. A copy will be signed by the DPW/BCE representative present to complete project acceptance.

(2) Equipment In-Place List. Including the make and model number of each piece of major equipment, with spare parts lists and manufacturer's catalogs for equipment. A draft document will be provided at the time of acceptance, with the final version provided no later than 30 days after acceptance. Normally this information will be included in the required O&M manuals for the facility.

(3) All specified keys, handles and tools required for operation of building equipment. All keys will be tagged for each lock clearly showing lock schedule data, building number or location.

(4) All warranty documents as required by the contract.

(5) Final contract specifications, including all modifications, will be furnished within 30 days of acceptance.

(6) O&M Manuals will be furnished within 30 days of acceptance.

(7) Final approved shop drawings/submittals will be furnished within 30 days of transfer.

(8) As-built construction drawings will be furnished as specified in the contract or as agreed upon with DPW/BCE within 60 days of transfer. At a minimum, marked-up red line drawings should be provided at the time of turnover.

(9) Status report on items which the customer determines should have been included in the contract will be furnished within 30 days of transfer, along with recommended actions to remedy those deficiencies.

Upon correction of all deficiencies, the USACE District Office will notify the DPW/BCE that all deficiencies have been corrected and that action will be taken to close out the project. Upon final close out of the project by the USACE District, a 'Financially Complete' DD Form 1354 will be provided within 30 days. Financially completed costs, including design and all other non-construction costs, will be allocated to all Category-Coded items as appropriate by the USACE Office.

D. During Warranty Period: The warranty period on the constructed facility begins on the acceptance date of the facility from the contractor and extends for one year. At the beginning of the warranty period the contractor will be advised of the warranty procedures and will be requested to furnish the name and phone number of their warranty contact to the DPW/BCE.

(1) When the facility user discovers what he/she thinks is a warranty problem, it is reported to the appropriate DPW/BCE personnel. The DPW/BCE will make the primary determination as to whether the defect results from a warranty problem, user abuse, improper operation or maintenance, or from a design or construction deficiency. If the defect is determined to be the responsibility of the construction contractor, the DPW/BCE will make initial contact with the contractor, vendor or manufacturer to obtain correction. In the case of a critical item affecting habitability of living space or operations, this contact should be expedited. In the case of non-critical defects, a list should be maintained and presented at the four and nine month

(2)

warranty inspections. If the initial effort by the DPW/BCE to solve the problem is unsuccessful, the USACE District Office should be contacted for action. Some caution should be used in requesting warranty defect correction by the construction contractor. If the problem is not an actual warranty item, and the contractor responds and corrects the problem, it could be viewed as an obligation of the Government. If there are questions as to the validity of a warranty complaint, the USACE District Office should be consulted. The contract Performance Bond remains in effect through the one-year warranty period, and if the contractor is not responsive, the surety may be used as a means to have warranty deficiencies corrected.

(2) The project manager needs to be kept apprised of warranty actions, so as to take the lead in coordination with the customer to correct the identified deficiencies by the most expedient means possible, especially with regard to the resolution of any funding questions. The customer must ultimately decide whether to pursue correction by the construction contractor. This is a business decision which must be made by weighing funds required against the likelihood of recovery, and whether the corrective action will be taken in a timely manner to satisfy the needs of the customer. The USACE project manager will provide advice to the customer in this regard.

(3) All necessary actions shall be taken by the USACE District Office to recover the cost of defects from the contractor or design firm when they are deemed responsible. Neither acceptance of a facility by the Government nor the end of the warranty period ends the contractor's, manufacturer's, or supplier's liability for defects of a latent nature. However, the burden of proof to establish failure due to the latent defect falls on the Government. As soon as a latent defect is suspected, the customer should contact the CA and a joint inspection should be held. If the contractor responsible for the warranty or latent defect refuses to perform or is no longer in business, the CA will notify the surety that furnished the required performance bond for the construction contract, or other optional bonding instruments. The CA will pursue warranty corrections with the surety as well as the contractor until all warranty defects have been corrected.

(4) Periodic meetings will be held between the USACE District Office and the DPW/BCE to exchange information concerning completed facilities, in order to highlight recurring maintenance problems, user complaints and deficiency correction, as well as maintenance or functional data which may indicate a design or construction deficiency.

(5) Joint warranty inspections: Four months and nine months after acceptance, warranty inspections will be scheduled by the USACE District Office and conducted with the DPW/BCE representatives, the user, and, if possible, contractor personnel attending. The DPW will provide a list of work orders on the facility to help identify defects. A list of deficiencies existing at the time will be compiled and furnished to the contractor for correction.

5. **DISPOSITION**: This Memorandum of Understanding will be reviewed and updated as required, especially upon the change of either of the signatories.

\_\_\_\_\_ (Date)  
(Name)  
(Position)  
DPW/BCE

\_\_\_\_\_ (Date)  
(Name)  
(Position)  
USACE District Office

## APPENDIX B

## JOINT INSPECTION CHECKLIST

The following is a list of items needed at the Joint Inspection of a completed facility, in order to provide for a smooth transfer of real property to the facilities manager. This transfer is a critical time at which to insure that the customer understands the implications of each step in the process, and the continuing nature of USACE support during the warranty period.

1. Transfer documents. For Military Construction, prepare DD Form 1354, Transfer and Acceptance of Military Real Property, by updating the draft DD Form 1354 prepared by the designer during the final design phase of the project. Since final costs normally are not known at this time, the cost shown on the DD Form 1354 will be the best available estimate at time of preparation. When the final costs of construction are known, the CA will furnish those costs on a final DD Form 1354. The total final costs shall include the cost of construction, supervision and administration, design, and any other costs recognizable as adding to the value of the facility. Military Construction Army projects also require DA Form 2877, Real Property Record Card prepared in accordance with AR 420-17, or electronic equivalent. For other than Military Construction, appropriate transfer documents will be prepared in accordance with the MOU with the customer.
2. List of real property for all installed equipment and equipment-in-place, if appropriate.
3. Comprehensive operating and maintenance manuals (called "systems operating manuals" by Air Force) for all equipment and systems for use by operating personnel in accordance with ER 25-345-1 as set out in the contract documents. Obtain record sets of wiring diagrams, piping layouts, valve charts, valve tags, color codes for wiring and piping, and spare parts catalogues. The contract requirement for a warranty tagging scheme may be specified as set out in the guide specification, and if so, this should be completed for the facility as well.
4. List which provides the following information for the general warranty and any special warranty items:
  - a. The specific contact point at the prime contractor with complete address and telephone number. If the contact for warranty action is other than the prime contractor, i.e. a warranty manager, or local representative for a subcontractor, give specific procedure for contact. It is strongly advised, that in the case of any sizable facility, a warranty management plan be specified, which requires the contractor to provide a summary book of all materials relating to all warranty information, at the time of transfer. The Guide Specification contains an optional contract clause which can specify expected response times for warranty problems on various types of construction, and it should be

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considered for inclusion in the contract. It is strongly advisable to conduct a post-construction meeting at the time of transfer, including both the customer and the contractor, to discuss the procedures for warranty correction.

b. The period during which each warranty is in effect. Assure that warranties, such as those for roofing, which extend beyond the normal one-year period are documented. Assure that each subcontractor or supplier warranty is listed in accordance with FAR 52.246-21(g).

c. Obtain all separate warranty documents for installed systems equipment.

d. Obtain a copy of the test results for mechanical and electrical systems and/or equipment stating that the systems have been tested in accordance with the contract documents. For complex facilities, see requirements in ER 25-345-1, Systems Operation and Maintenance, which outlines considerations for commissioning, testing & balancing procedures for HVAC systems, and the mandatory requirements of performance verification of such.

e. Obtain all specialized keys, handles, and tools required for operation of building equipment. Tag keys for each lock, clearly showing lock schedule data, building number, or designation.

f. Ensure that the necessary training for customer personnel is conducted. The customer should consider the providing of videotapes of operating procedures to be provided by the contractor for use by incoming personnel. This information would also be invaluable to contracted facility management personnel operating the facility, and should be considered as part of the contract requirements.



## APPENDIX C

## TRANSFER DOCUMENTS DELIVERY

1. "As-built" Drawings including the project site plans. These requirements need to be tailored to customer needs, and may be satisfied with CADD materials if so desired.
2. Final approved shop drawings - no later than 30 days after transfer of the completed facility.
3. Construction contract specifications including modifications thereto - no later than 30 days after transfer of the completed facility.
4. The make and model number of each major piece of equipment, with spare parts lists and manufacturer's catalogs for the equipment - draft at time of transfer, final no later than 30 days after transfer of the completed facility, normally as part of the O&M manuals.
5. Operation and maintenance manuals - draft at time of transfer, final editions of manuals no later than 30 days after transfer of the completed facility.
  - (a) For facilities which have been designated by the Air Force as complex facilities, operation and maintenance instructions will be provided in accordance with the MOU.
  - (b) For Army facilities, appropriate operation and maintenance manuals and schedules for assistance during the initial period following turnover will be provided for complex stand-alone facilities and for complex systems within major facilities in accordance with the provisions and direction of ER 25-345-1 as outlined in the contract requirements.
6. Status report on proposed or recommended actions regarding features of work desired by the customer, which were not included in the construction contract - no later than 30 days after transfer of the completed facility.

## APPENDIX D

### AS-BUILT DRAWINGS

1. Introduction. As-built Drawings (also called record drawings) are an important product provided to a customer, including USACE civil works operations personnel, upon the completion of a construction or renovation project. Customers must have complete, accurate and timely as-built information for proper operations and maintenance, effective warranty enforcement, and future repair and rehabilitation work.
2. Method of Preparation for Military Projects. The construction contractor will prepare the final as-built drawings, whether in manual or CADD format. There are many advantages to this method. Only one party is responsible for the overall as-built drawing process, which reduces the likelihood for mistakes and misunderstandings. Timeliness and quality can be enforced through the construction contract clauses and payment process. The final as-built drawings can be prepared after the completion of each phase of the construction. Finally, the cost of preparing the final as-built drawings is absorbed in the overall construction contract price. No separate line item cost for the preparation of as-built drawings will be included in the Current Working Estimate.
3. Method of Preparation for Civil Works Projects. The preferred method of preparing the final as-built drawings is by the construction contractor. The management plan for the project must justify the preparation of the final as-built drawings by any other method, such as by in-house personnel. Two such exceptions are emergency construction and operations work performed with hired labor.
4. Customer Coordination. The method of producing the as-built drawings and their format will be discussed with the customer at the beginning of a project, reflected in the Memorandum of Understanding with the customer (if applicable) and the management plan for the project, and confirmed with the customer before issuing the construction solicitation. If CADD as-built drawings are required, their specific format and media must be agreed to by the customer and reflected in the design statement of work. The latest version of the CADD standards developed by the Tri-Service CADD/GIS Technology Center should be used, unless a non-Corps customer specifically desires otherwise.
5. Working As-Built Drawings. The specifications will require the construction contractor to maintain a current record of the work as actually constructed in the form of working as-built drawings. These working as-built drawings will typically be red-line mark-ups of two sets of the construction plans (one for use by the contractor and one for use by the government), but may be

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in electronic format if appropriate. The working as-built drawings must be reviewed for currency, completeness, accuracy and clarity at least monthly by the Resident Engineer in conjunction with the approval of progress payments.

6. Final As-Built Drawings. The contract specifications will require the contractor's project schedule to show separate activities with realistic payment amounts for preparation of the final as-built drawings after the completion of specific phases of work (foundations, utilities, structural steel, etc., as appropriate for the project). For civil works projects where extensive bid items are used, the cost of the as-built drawings must be specifically attributed to particular bid items. Compliance and delivery of the final as-built drawings will be enforced through the approval of progress payments. Also, the quality of the final as-built drawings will be reflected in the construction contractor's performance evaluation.

7. Transfer to Customer. Interim as-built drawings will be provided to the customer at project transfer. Interim as-built drawings may be a combination of final as-built drawings for early phases of the project (such as foundations, utilities, and structural framing) and red-line mark-ups for later phases (such as electrical, mechanical and communications). The completed final as-built drawings, in the required media, format and quantities, will be provided to the customer within 60 days after project transfer. The 60 day period includes time for final drawing preparation by the contractor, government review, and correction by the contractor.