DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
Washington, DC 20314-1000

CECW-CE

ER 1110-34-1

Regulation
No. 1110-34-1

31 October 2016

Engineering and Design
TRANSPORTATION SYSTEMS
MANDATORY CENTER OF EXPERTISE

1. Purpose. This regulation sets forth the authority, policy, roles and responsibilities of the U.S. Army Corps of Engineers (USACE) Transportation Systems Mandatory Center of Expertise, also known as the USACE Transportation Systems Center (TSC). It also provides guidance and procedures by which the USACE Commands and other Department of Defense (DoD) and Government agencies obtain these services.

2. Applicability. This regulation applies to all USACE commands and other DoD agencies requiring or electing to use TSC services.

3. References.

a. AR 95-2, Airspace, Airfields/Heliports, Flight Activities, Air Traffic Control and Navigational Aids

b. AR 420-1, Army Facility Management

c. ER 5-1-10, Corps-wide Areas of Work Responsibility

d. ER 1110-1-8158, Corps-wide Centers of Expertise Program

e. ER 1140-1-211, Support for Others: Reimbursable Work

f. ER 1140-3-1, Support to Defense Department and Agencies

g. UFC 3-260-02, Pavement Design for Airfields

h. UFGS 32 13 11, Concrete Pavement for Airfields and Other Heavy-Duty Pavements

i. UFGS 32 12 15.13, Hot-Mix Asphalt Airfield Paving

j. UFGS 32 12 15.16, Warm-Mix Asphalt Airfield Paving

This regulation supersedes Engineer Regulation 1110-34-1, dated 10 January 1990

4. Distribution. Approved for public release, distribution unlimited.

5. Mission. The engineering of military transportation systems is a highly specialized field and is critical to the security and readiness of the Nation. To maintain highly skilled advanced transportation systems technical expertise within the USACE, the TSC is established to support engineering, planning, design, construction, evaluation, criteria development and real property requirements for all military transportation systems to include airfields, railroads and roadways. The TSC also provides related technical expertise for Civil Works. The TSC is also established to provide continuity, standardization and technical excellence within the USACE and provide transportation systems technical support to USACE activities, the Army, and other DoD agencies worldwide.

a. The TSC will maintain state-of-the-art technical expertise in all areas of transportation systems engineering including, but not limited to, the following:

(1) Airfield planning, design, construction and evaluation.

(2) Airfield geometrics and safety clearances.

(3) Airfield lighting and NAVAIDS design and construction.

(4) Aircraft Arresting Systems (AAS) design and construction.

(5) Airfield and roadway pavement marking.

(6) Railroad track layout, design, construction and evaluation.

(7) Roadway pavement layout, design, construction and evaluation.

(8) Airfield, railroad and roadway construction materials.

(9) Pavement-Transportation Computer Assisted Structural Engineering (PCASE).

(10) Pavement management system program maintenance, implementation and training (PAVER).

b. TSC subject matter experts (SME) shall represent USACE on a minimum of one national/international technical committee or tri-service technical committee or working group in their areas of expertise.

c. The TSC serves as the USACE point of contact for the planning, design, construction and maintenance and repair (M&R) management of military airfields, railroads and roadways. The TSC will also assist HQUSACE in transportation systems related policy formulation, program

guidance, technology transfer, research and development monitoring, specialized training and interagency coordination. These services include, but are not limited to:

(1) Function as subject matter expert in all issues related to design and construction of airfields, railroads and roadways for Civil Works, Military and Interagency and International Services (IIS) support programs.

(2) Perform mandatory review of all USACE designed airfield and railroad projects at any dollar value and all roadway projects exceeding cost stated below in paragraph 6.b., Reimbursable Mandatory Services.

(3) Perform consulting services for the planning, design and construction of airfield, railroad and roadway projects.

(4) Develop and/or update criteria documents (UFC, UFGS, ETL, ECB, etc.) and computer programs (PCASE and PAVER) related to airfields, railroads and roadways.

(5) For transportation systems related services, develop and manage A-E Indefinite Delivery Indefinite Quantity (IDIQ) contracts and make available for use by USACE districts, centers, laboratories and TSC.

(6) Coordinate technical criteria issues with the private sector (academia, industry, professional and technical societies, working groups, etc.) and the Air Force and Navy counterparts.

(7) Monitor USACE research, development, testing and evaluation work units related to airfields, railroads and roadways.

(8) Develop and manage training and workshops per USACE policy and guidance.

d. The Director, USACE TSC represents HQUSACE on the Army Airfields/Heliports (AAFs/AHPs) Council of Colonels (CoC) executive committee. Other executive committee members include representatives from US Army Aeronautical Services Agency (USAASA), US Army Aviation Center of Excellence (USAACE), and the Office of the Assistant Chief of Staff Installation Management (OACSIM).

(1) Purpose. The CoC is a body to resolve AAF/AHP issues to ensure safe, responsive service to Army component commanders, joint forces and combatant commanders. Issues are resolved by CoC action, directing to the appropriate agency, or referring to senior leadership for decision.

(2) Scope. The CoC addresses life cycle management of AAF/AHPs. The proponent members provide direct linkage to the HQ DA, G3/5/7, Chief of Engineers and the Aviation

Branch Chief, and facilitate resolution of issues requiring additional or redirected resources, or new implementing directives.

6. Mandatory Services Provided by the TSC.

a. Centrally-funded mandatory services:

(1) Participate in quarterly AAF/AHP CoC meetings.

(2) Development/update of Army Standard and the appropriate Standard Criteria for Air Installation Complex.

(3) Provide technical support to HQUSACE when requested.

b. Reimbursable mandatory services:

(1) Provide technical review of all USACE designed airfield projects for all phases of design per Appendix A.

(2) Provide technical review of all USACE designed railroad projects for all phases of design per Appendix A.

(3) Provide technical review of all phases of design on USACE designed roadway projects with roadway portion having cost greater than $5,000,000 per Appendix A.

(4) Conduct on-site Airfield Paving Workshops and post-award teleconferences for all USACE managed airfield projects with cost exceeding $5,000,000 per Appendix B.

(5) Provide on-site technical support during construction for all USACE managed airfield projects that have cost greater than $10,000,000 per Appendix B.

(6) Provide technical review of Portland Cement Concrete (PCC) mix designs, Hot Mix Asphalt (HMA) job mix formulas (JMF), and Warm Mix Asphalt (WMA) JMF for all USACE managed airfield projects per Appendix C.

(7) Provide technical review of all Army airfield and heliport (AAF/AHP) projects, waivers and pavement evaluations per AR 95-2.

7. Elective Services (reimbursable).

a. Provide A-E task order contracts for airfield/roadway design and evaluation, railroad/roadway design and evaluation, Army airfield obstruction surveys, pavement condition

index (PCI) surveys for airfields and roadways, petrographic and specialized concrete testing and airfield pavement construction phase support services (technical expert on site).

b. Provide on-site Airfield Paving Workshops for USACE managed airfield projects, when requested and funded by Corps Districts for projects that are less than reflected in the mandatory reimbursable service stated above in paragraph 6.b.

c. Provide on-site Airfield Paving Workshops for Air Force and Navy airfield projects when requested and funded.

d. Provide technical review of Air Force and Navy designed airfield, railway, and roadway projects when requested and funded.

e. Provide on-site technical support for airfield, railroad and roadway projects when requested and funded.

f. Provide PCASE workshops for USACE districts. Provide workshops for Air Force and Navy when requested and funded.

g. Provide on-site Airfield Lighting Construction Workshop for Army, Air Force and Navy when requested and funded.

h. Provide Airfield Design Workshops for Army, Air Force and Navy when requested and funded.

8. PCASE Activities. PCASE is established to computerize the complex pavement and transportation systems structural engineering calculations contained in Unified Facilities Criteria documents. PCASE USACE funding source is Fee for Service (FFS) as approved by the Civil Works Investment Review Board (IRB) and the Executive IRB. PCASE also receives funding from HQ Air Force Civil Engineering Center (AFCEC), and occasionally from NAVFAC, IMCOM and ACSIM for incorporation of agency specific criteria. PCASE activities include:

a. Managing the PCASE program.

b. Chairing PCASE committee for establishing District field needs.

c. Overseeing the development and update of PCASE software as dictated by the PCASE Committee.

d. Testing software and establishing testing and validation procedures for the software.

e. Providing required certification of the software.

f. Providing training on the software use and acting as point of contact for assisting the PCASE users in the implementation and use of the PCASE software.

9. PAVER Activities. PAVER is a pavement management system developed to manage pavement M&R airfields, roads, and parking lots; this includes pavement inventory, Pavement Condition Index (PCI) inspection, condition forecasting, M&R optimization and planning for different budget scenarios, and projects formulation. PAVER requirements and funding are provided by IMCOM, AFCEC, Forest Service, or directly from the military installations seeking PAVER support. PAVER activities include:

a. Managing PAVER new implementations and re-inspections as directed by US Army Installation Management Command (IMCOM) and US Air Force Civil Engineer Center (AFCEC).

b. Managing PAVER program maintenance, update and testing.

c. Serving as member of the Air Force Process Improvement Teams (PIT) for M&R management of airfield and non-airfield pavements.

d. Providing training on the use of the PAVER program by military installations.

e. Updating UFC, ETL, and ASTM standard relating to Pavement Condition Index (PCI) and/or PAVER.

f. Acting as a point of contact for assistance on matters related to pavement evaluation and management including potential court cases.

10. A-E Contracts.

a. Air Force O&M projects, Army OMA projects and numerous priority MCP and MCA projects have very short lead times to select an A-E firm, award the A-E design contract, prepare the design and award the construction contract. To reduce the time required for the selection and award of the A-E design contracts, the TSC is authorized to develop and ensure USACE maintains sufficient A-E IDIQ contracts with specialized transportation systems engineering experience and expertise to support the execution of the TSC mission and responsibilities. The TSC coordinates with PARC, MSCs and District Contracting Offices to facilitate establishing contracts and task orders. These contracts and task orders are available for use by USACE Districts to facilitate meeting design schedules and to provide technical support during construction. The USACE District requiring the task order will develop task order scope of work, award task order and provide fiscal management.

b. TSC is authorized to develop and manage one or more of these small business and unrestricted IDIQ contracts for the following:

(1) Design and evaluation of airfield projects.

(2) Design and evaluation of railroad/roadway projects.

(3) PAVER condition surveys and implementation.

(4) Army airfield obstruction surveys.

(5) Petrographic and specialized concrete testing.

(6) Airfield pavement construction management services to include on-site technical experts and laboratory testing services.

11. Training.

a. Airfield Paving Workshops. On-site Airfield Paving Workshops are required to be funded by the District and conducted by TSC for all USACE constructed airfield projects exceeding the amount stated above in paragraph 6.b. or when specifically requested. Airfield Paving Workshops are also provided for the Air Force and Navy when requested and funded. Appendix B provides requirements for Airfield Paving Workshops.

b. Airfield Lighting Construction Workshops. On-site workshops are conducted by the TSC for Air Force and Army constructed airfield lighting projects when requested and funded.

c. Airfield Design Workshop. The TSC instructed workshop provides all the information needed for preparing a DoD airfield design package. The workshop provides the latest information on airfield design criteria, project data gathering, geometric and air space requirements, editing guide specifications, typical drawings (phasing, removal, jointing, etc.), standard details, sub-drainage, pavement markings and much more.

d. PCASE Workshops. PCASE software is used by Pavement Engineers as a tool for designing mission essential pavements and repair alternatives for both airfields and roadways. To help users understand how to use the many facets of the software, hands-on computer workshops are offered. The workshops have been very successful at not only demonstrating and providing hands-on use of the software but also in providing the engineering background (criteria) used in design and evaluation.

e. PAVER Workshops. The PAVER system is the predominate pavement management system and the main source for all pavement real property data for all DoD. Army mandates the use of PAVER to manage their pavement assets. The Pavement Condition Index (PCI) is also

used by the Air Force, Navy and Army evaluation teams for evaluating airfield pavements. PAVER workshops and PAVER/PCASE workshops are provided for Army, Air Force and Navy when requested and funded.

12. Responsibilities.

a. HQUSACE. CECW-CE is the action office for the administrative oversight of the TSC and assigns a HQUSACE proponent. The proponent will assure adequate manpower is assigned to maintain the technical expertise and capabilities detailed in the regulation. They will assure adequate central funding is made available to cover cost associated with the mandatory tasks from paragraph 6.a. above. The HQ proponent supporting PCASE requests funds to the Civil Works IRB. PCASE activities are funded as approved by the Civil Works IRB and the Executive IRB.

b. USACE Major Subordinate Command (MSC). Each MSC will ensure that the TSC has been engaged by their districts as required by this regulation and USACE policy. MSC will review any proposed exceptions to the use of TSC services prior to submitting to HQUSACE (CECW-CE) for approval/disapproval.

c. USACE Districts. For airfield projects requiring mandatory services from the TSC as stated in paragraph 6.b above, the Districts will:

(1) Include statements in their project documentation and signed by the Chief of Engineering function and the Chief of Construction function, certifying requirements of ER 1110-34-1 to include requirement for TSC design review and on-site workshops and support has been or will be adhered to.

(2) The Project Management Plan is to include the design review requirement, on-site paving workshop, and on-site TSC support, as required herein. The QA Plan is to include the requirement for on-site paving workshop, and other TSC support, as required herein.

(3) All USACE designed airfield pavement projects are to be designed and constructed using UFC and UFGS. . Reference 3.a and 3.b provide this direction for Army airfield projects. This requirement to use the UFC and UFGS will apply regardless of the delivery method used.

(4) Editing of UFGS. For all airfield projects, editing or rewriting of un-bracketed text in the referenced UFGSs, paragraph 3h, 3i, and 3j is not allowed. This requirement is to control undisciplined and improper editing of the mandatory UFGSs. For unique conditions, any recommended change to un-bracketed areas of the UFGSs, the designer will submit changes, with lined-through deletions and underlined additions, to the USACE Transportation Systems Center for approval or disapproval prior to incorporating in the specification. Recommended changes are to include specific changes and supporting documentation indicating the reasons for the change(s).

d. Omaha District. The Omaha District is to maintain the TSC at a level in the organization which is appropriate for the TSC activities and conducive to successful execution of the mission and function identified in this regulation. No changes to the TSC mission or function are to be implemented without approval from HQUSACE CECW-CE and revision of this regulation. District leadership is to assure that staffing levels in the TSC are adequate to handle all tasks assigned in this regulation. Organizational and administrative support such as training, office space, contracting and computer hardware and software is provided by the District as is done for other district organization elements. Omaha District, Engineering Division provides in-house design support related to the TSC mission.

13. Procedures for TSC Use.

a. Requests for TSC services may be submitted to TSC by telephone or email. Informal communication is encouraged, however, a mutually acceptable scope of work, schedule and cost estimate is to be developed by the TSC and requesting district or agency before any reimbursable work commences.

b. Requests from customers other than USACE for design services, which include complete design projects, will be coordinated with appropriate USACE MSC and District in accordance with ER 5-1-10.

c. The types of work listed below will not be subject to the requirements of ER 5-1-10. When this work requires TSC personnel or TSC A-E contractors travel to a customer within the geographic boundaries of another district, the TSC will contact the appropriate GD. The purpose, customer, location, date of visit and personnel travelling will be furnished to the appropriate GD point of contact.

(1) Requests for design and construction services for airfield pavement projects managed by the customer.

(2) Requests for services such as design reviews, specialized consulting services, airfield obstruction surveys, pavement evaluations, airfield suitability studies, Airfield Paving Workshops, or airfield, railroad and roadway criteria development which are inherent functions of the TSC.

14. Exceptions. There are no specific routine waivers to mandatory use of the TSC. Waivers must be fully justified and submitted by the MSC to HQUSACE for CECW-CE approval/disapproval.

FOR THE COMMANDER:

PAUL E. OWEN
COL, EN
Chief of Staff

4 Appendices
Appendix A Design Review Policy for USACE Designed Airfield, Railroad, and Roadway Projects
Appendix B Construction Management Policy for Airfield Pavement Projects
Appendix C Review Requirements for Airfield Pavement Mix Designs and Job Mix Formulas
Appendix D Estimated Fee Guidelines for TSC Support

APPENDIX A

Design Review Policy for USACE Designed Airfield, Railroad and Roadway Projects

A-1. This appendix provides the design review policy for USACE designed airfield, railroad, and roadway projects.

A-2. Mandatory TSC Design Review

a. Airfield and Railway Projects. All airfield and railroad project designs, regardless of funding type or cost, require TSC review. This includes Army, Air Force, Navy and Air National Guard (ANG) projects, sustainment, restoration and modernization (SRM) projects, Civil Works projects, Foreign Military Sales (FMS) projects, Host Nation (HN) projects, Combined Defense Improvement Projects (CDIP) and other Interagency and International Services (IIS) projects. Airfield projects include airfield pavements, airfield lighting, marking and navigational aids (NAVAIDS), hydrant fuel projects (pavements portion only) and any facility located within airfield operational airspace.

b. Roadway Projects. All projects, regardless of funding type, where the roadway portion exceeds the threshold for roadways, as stated in paragraph 6.b of this regulation, also require TSC review of the roadway design. This includes Army, Air Force, Navy, ANG, SRM, Civil Works, FMS, HN, CDIP and other IIS projects. Roadway projects less than the cost threshold will be reviewed only when requested and funded by the design district. Roadway projects include roads, streets, non-organizational parking areas, organizational vehicle parking areas, vehicle and tank hardstands, tank trails and any pavements in support of transportation vehicles.

A-3. Project Management Plan (PMP) for projects with design review requirement, as stated above, will reflect this effort and funding required. Project managers should contact the TSC during development of the PMP.

A-4. For projects requiring TSC review, two copies of all planning and design documents (project booklets, DD Form 1391s, plans, specifications and design analyses) and one electronic copy (CD/DVD) are be sent to the following:

US Army Corps of Engineers
Transportation Systems Center
1616 Capitol Avenue
Omaha, NE 68102-4901

A-5. All TSC review efforts will be funded and reimbursed by the design district. Estimated fees associated with the review of designs are reflected in Appendix D.

A-6. Technical questions may be addressed to the Director, Transportation System Center, 402-995-2399.

APPENDIX B

Construction Management Policy for Airfield Pavement Projects

B-1. This appendix provides the policy to enhance quality of airfield pavements construction using existing USACE resources from the TSC to assist districts to achieve designed requirements during construction.

B-2. Mandatory TSC Construction Support Services

a. On-site Airfield Paving Workshop conducted by the TSC - required on USACE managed airfield construction projects with CWE of the airfield portion of project in excess of the threshold stated in paragraph 6.b of this regulation.

b. On-site technical support by the TSC during start-up of construction - required on USACE managed projects with cost of airfield pavement portion in excess of threshold stated in paragraph 6.b of this regulation. This applies no matter the acquisition delivery method.

c. Post-award teleconference is required on all USACE managed airfield pavement projects with a CWE in excess of the threshold stated in paragraph 6.b of this regulation.

B-3. Optional TSC Support Services

a. For projects that do not require mandatory services:

(1) Airfield Paving workshops will be provided by the TSC only when requested and funded by the district or customer.

(2) Pre-bidders presentation will be provided by the TSC only when requested and funded by the district.

(3) Post award discussions, for airfield pavement projects less than the previously stated threshold, will be provided by the TSC when requested and funded.

b. Additional on-site TSC technical support includes PCC plant inspection and uniformity testing, inspection of PCC, HMA, and/or WMA test sections, inspection of PCC, HMA and/or WMA mainline paving, troubleshooting, joint sawing and sealing, etc.

c. Quality assurance (QA) inspection and testing services are available using TSC IDIQ A-E contracts to supplement District in-house expertise and capabilities.

B-4. TSC Construction Support Services

a. A pre-bidders' presentation will be conducted in-person, by the USACE TSC, when requested and funded. Presentation will be approximately 1 ½ hours and will highlight the contract requirements for contract specifications 32 13 11, 32 12 15.13 and/or 32 12 15.16.

b. A post-award teleconference is held prior to the Airfield Paving Workshops, when requested and funded, to discuss freeze-thaw testing, aggregate testing, alkali silica reaction (ASR) testing, deleterious materials testing, mix design studies, etc. The teleconference will be approximately two hours and should be attended by prime contractor, paving contractor, QC manager, paving superintendent, materials suppliers, laboratory of record for mix design studies, laboratory of record for aggregate testing, etc.

c. The on-site Airfield Paving Workshops discuss how to construct high quality PCC, HMA, and/or WMA airfield pavements.

(1) Workshops are provided for USACE Quality Assurance (QA) staff, contractor and subcontractor Quality Control (QC) and construction staff, materials suppliers, and testing personnel. USACE designers, local Base Civil Engineer (BCE) staff and local Director of Public Works (DPW) staff may also be invited to attend.

(2) The workshops are usually one day for HMA paving and two days for PCC slipform paving. The workshops are tailored to specific project requirements. HMA workshops include mix design, plants, surface preparation, laydown, compaction, QC/QA, performance problems and review of contract specs UFGS 32 12 15.13 and/or UFGS 32 12 15.16. PCC workshops include intro, subgrade/base, materials/mix design, plants, uniformity testing, demolition, slipform paving, fixed form paving, dowel installation, joint sawing/sealing, QC inspection/testing, control charts, acceptance and review of contract spec UFGS 32 13 11.

d. On-site technical support by the TSC during start-up of construction

(1) Airfield paving projects that require on-site TSC support is stated in paragraph B-2.b.

(2) This support will include observing and analyzing construction test section results, verification of concrete and asphalt plant calibration, and observing work quality during early phases of the construction paving portion of the project.

B-5. Requests for Airfield Paving Workshops, pre-bid/post-award discussions, and on-site TSC technical support services should be addressed to:

U.S. Army Corps of Engineers
Transportation Systems Center
Attn: Director, USACE TSC
1616 Capitol Ave
Omaha, NE 68102-4901

B-6. Estimated fees associated with TSC construction support services, including technical support during start-up of construction, paving workshop, and post award teleconference, are reflected in Appendix D.

B-7. Technical issues related to workshops and pre-bid/post-award discussions and on-site TSC technical support services may be directed to Director, USACE Transportation Systems Center, 402-995-2399.

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APPENDIX C

Review Requirements for Airfield Pavement Mix Designs and Job Mix Formulas

C-1. This appendix provides additional direction requiring USACE TSC review of airfield pavement Portland Cement Concrete (PCC) mix designs and Hot Mix Asphalt (HMA) and Warm Mix Asphalt (WMA) job mix formulas (JMFs) during the construction phase for all USACE-managed Airfield Pavement Projects.

C-2. Direction. PCC mix design submittals, HMA JMF, and WMA JMF submittals for all USACE managed airfield pavement projects are to be submitted to the TSC for review prior to approval of the submittals by the construction contracting officer or their representative.

C-3. The specific procedures for USACE TSC review of PCC mix designs, HMA JMF and WMA JMF are provided below.

a. Schedule: Plan on ten work days for each review. Reviews will be completed as soon as possible, depending on workload.

b. Procedures:

(1) Prior to forwarding the submittal data for review by the USACE TSC staff, district construction staff are to be sure that the submittal includes all of the information required by UFGS 32 13 11, Submittal SD-05 Design Data, Proportioning Studies, and by paragraph entitled Proportioning Studies for PCC mix designs. For UFGS 32 12 15.13 and UFGS 32 12 15.16, the submittal needs to include all of the information required by Submittal SD-03 Product Data, Mix Design, and all information required by paragraph entitled JMF Requirements. All aggregate quality testing reports and asphalt cement certification testing for HMA or WMA JMF are to be included in submittal.

(2) Contact the TSC at 402-995-2399 or 402-995-2406 for the email addresses of where the submittals are to be sent for review and the names of the reviewer. Send an e-mail with the complete submittal and the appropriate contract specifications with addendums (UFGS 32 13 11, 32 12 15.13 and/or 32 12 15.16) in electronic (pdf) format to the reviewers email addresses provided by the TSC.

(3) The TSC will electronically confirm the receipt of submitted documents from district construction managers and provide back an expected completion date. Reviews will be completed and comments/recommendations will be provided via e-mail to the requestor and any other person copied on the original request.

C-4. All TSC review efforts will be funded and reimbursed by the design district. Estimated fees associated with the review of airfield pavement mix designs and job mix formulas are reflected in Appendix D.

C-5. Technical issues related to reviews may be directed to the Director, USACE Transportation Systems Center, 402-995-2399.

Appendix D

Estimated Fee Guidelines for TSC Support

D-1. This appendix provides the additional information concerning estimates for fees for design reviews, mix design and job mix formula reviews, paving workshops, and on-site support during construction by the TSC.

D-2. Design Reviews

a. A list of estimated review fees based on the airfield, road, and railroad portion of the project Programmed Amount is provided below.

b. Review fee estimates are based on two reviews, preliminary design and final design. Additional reviews will require approximately 35% higher review fees.

c. Additional funding for travel and labor will be required for review conferences and site visits, when requested and funded by the design District or customer. Funding for review conferences or site visits should be provided a minimum of two weeks before travel date and may be included with the original review fee.

d. Airfield projects that include both pavements and lighting/NAVAIDS will require higher review fees depending on the scope of work. Projects that include one lighting system (taxiway edge lights, etc.) will require the basic review fee plus $3,500. Each additional lighting system will require $2,000 more.

e. Design-build projects will require at least 100% higher review fees depending on the size, scope and complexity of the project. As a minimum, they will require review of the draft Request for Proposal (RFP) and final RFP (developed by installation, District or A-E) and review of the preliminary design and final design (submitted by the design-build contractor). Design-build designs are commonly split up into multiple design packages resulting in the requirements for at least two reviews for each package.

f. Below is a guide to assist in preparation of design budget for estimating design review fee:

ESTIMATED REVIEW FEES

Programmed Amount	Review Fee
Less than $1,000,000	$4,500
$1,000,001 to less than $2,500,000	$6,000
$2,500,001 to less than $5,000,000	$8,000
$5,000,001 to less than $7,500,000	$9,000
$7,500,001 to less than $10,000,000	$10,000
$10,000,001 or greater	Contact TSC

D-3. Workshops - Approximate costs of airfield paving workshops and pre-bidders' presentation/post-award teleconference are as follows:

HMA (one day)	± $5,000 pending air fare
PCC (two days)	± $15,000 pending air fare
Pre-bid discussions	± $4,000 pending air fare
Post Award discussion	to be included in Workshop cost
Runway lighting (two days)	+ $15,000 pending air fare
Runway lighting (one day) (Less than 50% of lights replaced)	+ $12,000 pending air fare

D-4. On-Site Support during Construction. The Project Manager should typically budget for this supplemental start-up quality assurance support from the TSC to involve two persons for a two-week period during the initial pavement construction phase of the work. Estimated costs would be + $28,000 pending air fare.

D-5. Mix Design/Job Mix Formula Submittal Review Costs:

a. Each PCC mix design will cost an approximately $2000. Resubmittals costing approximately $1500 each.

b. Each HMA/WMA JMF will cost approximately $1500. Resubmittals will cost approximately $1000 each.

D-6. Funding will be provided to the TSC by the requesting USACE District activity. Contact the TSC to verify latest cost amounts for these reviews.

D-7. Funding issues related to reviews, workshops, and construction support may be directed to the Director, USACE Transportations Systems Center. 402-995-2399.

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