

50-15 FINAL ACCEPTANCE. Upon due notice from the CONTRACTOR of presumptive completion of the entire project, the ENGINEER and OWNER will make an inspection. If all construction provided for and contemplated by the CONTRACT is found to be completed in accordance with the CONTRACT, PLANS, and SPECIFICATIONS, such inspection shall constitute the final inspection. The ENGINEER shall notify the CONTRACTOR in writing of final acceptance as of the date of the final inspection.

If, however, the inspection discloses any work, in whole or in part, as being unsatisfactory, the ENGINEER will give the CONTRACTOR the necessary instructions for correction of same, and the CONTRACTOR shall immediately comply with and execute such instructions. Upon correction of the work, another inspection will be made which shall constitute the final inspection, provided the work has been satisfactorily completed. In such event, the ENGINEER will make the final acceptance and notify the CONTRACTOR in writing of this acceptance as of the date of final inspection.

50-16 COST REDUCTION INCENTIVE. The provisions of this subsection will apply only to CONTRACTs awarded to the lowest bidder pursuant to competitive bidding.

On PROJECTs with original CONTRACT amounts in excess of \$100,000, the CONTRACTOR may submit to the ENGINEER, in writing, proposals for modifying the PLANS, SPECIFICATIONS or other requirements of the CONTRACT for the sole purpose of reducing the cost of construction. The cost reduction proposal shall not impair, in any manner, the essential functions or characteristics of the PROJECT, including but not limited to service life, economy of operation, ease of maintenance, desired appearance, design and safety standards. This provision shall not apply unless the proposal submitted is specifically identified by the CONTRACTOR as being presented for consideration as a value ENGINEERING proposal.

Not eligible for cost reduction proposals are changes in the basic design of a pavement type, runway and taxiway lighting, visual aids, hydraulic capacity of drainage facilities, or changes in grade or alignment that reduce the geometric standards of the PROJECT.

As a minimum, the following information shall be submitted by the CONTRACTOR with each proposal:

- A. A description of both existing CONTRACT requirements for performing the work and the proposed changes, with a discussion of the comparative advantages and disadvantages of each;
- B. An itemization of the CONTRACT requirements that must be changed if the proposal is adopted;
- C. A detailed estimate of the cost of performing the work under the existing CONTRACT and under the proposed changes;
- D. A statement of the time by which a change order adopting the proposal must be issued;
- E. A statement of the effect adoption of the proposal will have on the time for completion of the CONTRACT; and
- F. The CONTRACT items of work affected by the proposed changes, including any quantity variation attributable to them.

The CONTRACTOR may withdraw, in whole or in part, any cost reduction proposal not accepted by the ENGINEER, within the period specified in the proposal. The provisions of this subsection shall not be construed to require the ENGINEER to consider any cost reduction proposal that may be submitted.

The CONTRACTOR shall continue to perform the work in accordance with the requirements of the CONTRACT until a change order incorporating the cost reduction proposal has been issued. If a change order has not been issued by the date upon which the CONTRACTOR's cost reduction proposal specifies that a decision should be made, or such other date as the CONTRACTOR may subsequently have requested in writing, such cost reduction proposal shall be deemed rejected.

The ENGINEER shall be the sole judge of the acceptability of a cost reduction proposal and of the estimated net savings from the adoption of all or any part of such proposal. In determining the estimated net savings, the ENGINEER may disregard the CONTRACT bid prices if, in the ENGINEER's judgment such prices do not represent a fair measure of the value of the work to be performed or deleted.

The OWNER may require the CONTRACTOR to share in the OWNER's costs of investigating a cost reduction proposal submitted by the CONTRACTOR as a condition of considering such proposal. Where such a condition is imposed, the CONTRACTOR shall acknowledge acceptance of it in writing. Such acceptance shall constitute full authority for the OWNER to deduct the cost of investigating a cost reduction proposal from amounts payable to the CONTRACTOR under the CONTRACT.

If the CONTRACTOR's cost reduction proposal is accepted in whole or in part, such acceptance will be by a CONTRACT change order that shall specifically state that it is executed pursuant to this subsection. Such change order shall incorporate the changes in the PLANS and SPECIFICATIONS which are necessary to permit the cost reduction proposal or such part of it as has been accepted and shall include any conditions upon which the ENGINEER's approval is based. The change order shall also set forth the estimated net savings attributable to the cost reduction proposal. The net savings shall be determined as the difference in costs between the original CONTRACT costs for the involved work items and the costs occurring as a result of the proposed change. The change order shall also establish the net savings agreed upon and shall provide for adjustment in the CONTRACT price that will divide the net savings equally between the CONTRACTOR and the OWNER.

The CONTRACTOR's 50 percent share of the net savings shall constitute full compensation to the CONTRACTOR for the cost reduction proposal and the performance of the work.

Acceptance of the cost-reduction proposal and performance of the cost-reduction work shall not extend the time of completion of the CONTRACT unless specifically provided for in the CONTRACT change order.

50-17 NOTICE OF POTENTIAL CLAIMS. If, for any reason, the CONTRACTOR deems that additional compensation is due for work or materials not clearly provided for in the CONTRACT, PLANS, or SPECIFICATIONS or previously authorized as extra work, *a notification of potential claim shall be made.* The ENGINEER shall be given a written notice of potential claim for such additional compensation before work begins on the items(s) on which the claim is based. *The written notice of potential claim shall set forth the reasons for which the CONTRACTOR believes additional compensation will or may be due, the nature of the costs involved, and, insofar as possible, the amount of the potential claim.* The CONTRACTOR shall afford the ENGINEER every opportunity and facility for keeping records of the actual cost

of the work. The CONTRACTOR shall keep records of the disputed work in accordance with Division III, Section 90-5, Payment for Extra and Force Account Work.

If such notification is not given or the ENGINEER is not afforded proper opportunity by the CONTRACTOR for keeping strict account of actual cost as required, then the CONTRACTOR hereby agrees to waive any claim for such additional compensation. Such notice by the CONTRACTOR and the fact that the ENGINEER has kept account of the cost of the work shall not in any way be construed as proving or substantiating the validity of the claim. When the work on which the claim for additional compensation is based has been completed, the CONTRACTOR shall, within 10 calendar days, submit written documentation of the claim to the ENGINEER. The ENGINEER will review the documentation and present it to the OWNER for consideration in accordance with local laws or ordinances.

Nothing in this subsection shall be construed as a waiver of the CONTRACTOR's right to dispute final payment of *in-place quantities* based on differences in *field* measurements or computations.

50-18 CLAIMS RESOLUTION. In accordance with Public Contract Code Section 20104-20104.6 and other applicable law, public works claims of \$375,000 or less which arise between the CONTRACTOR and the OWNER shall be resolved following the statutory procedure unless the OWNER has elected to resolve the dispute pursuant to Public Contract Code 10240 et seq.

- A. All claims shall be submitted in writing and accompanied by substantiating documentation. Claims must be filed on or before the date of final payment unless other notice requirements are provided in the contract. "Claim" means a separate demand by the claimant for (1) a time extension, (2) payment of money or damages arising from work done by or on behalf of the claimant and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled, or (3) an amount the payment of which is disputed by the OWNER.
1. Claims Under \$50,000. The OWNER shall respond in writing to the claim within 45 days of receipt of the claim, or, the OWNER may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims the OWNER may have. If additional information is needed thereafter, it shall be provided upon mutual agreement of the OWNER and the claimant. The OWNER's written response shall be submitted 15 days after receiving the additional documentation, or within the same period of time taken by the claimant to produce the additional information, whichever is greater.
 2. Claims over \$50,000 but less than or equal to \$375,000. The OWNER shall respond in writing within 60 days of receipt, or, may request in writing within 30 days of receipt of the claim, any additional documents supporting the claim or relating to defenses or claims the OWNER may have against the claimant. If additional information is needed thereafter, it shall be provided pursuant to mutual agreement between the OWNER and the claimant. The OWNER's response shall be submitted within 30 days after receipt of the further documents, or within the same period of time taken by the claimant to produce additional information or documents, whichever is greater.
- B. If the claimant disputes the OWNER's response, or if the OWNER fails to respond within the statutory time period(s), the claimant may so notify the OWNER within 15 days of the receipt of the response or the failure to respond, and demand an informal conference to meet and confer for settlement. Upon such demand, the OWNER shall schedule a meet and confer conference within 30 days.

- C. *If following the meet and confer conference, the claim or any portion thereof remains in dispute, the claimant may file a claim pursuant to Government Code 900 et seq. and Government Code 910 et seq. For purposes of those provisions, the time within which a claim must be filed shall be tolled from the time the claimant submits the written claim until the time the claim is denied, including any time utilized for the meet and confer conference.*
- D. *If a civil action is filed to resolve any claim the provisions of Public Contract Code 20104.4 shall be followed, providing for nonbinding mediation and judicial arbitration.*

DIVISION III

SECTION 60

CONTROL OF MATERIALS

60-1 SOURCE OF SUPPLY AND QUALITY REQUIREMENTS. The materials used on the work shall conform to the requirements of the CONTRACT, PLANS, and SPECIFICATIONS. Unless otherwise specified, such materials that are manufactured or processed shall be new (as compared to used or reprocessed).

In order to expedite the inspection and testing of materials, the CONTRACTOR shall furnish complete statements to the ENGINEER as to the origin, composition, and manufacture of all materials to be used in the work. Such statements shall be furnished promptly after execution of the CONTRACT but, in all cases, prior to delivery of such materials.

At the ENGINEER's option, materials may be approved at the source of supply before delivery is stated. If it is found after trial that sources of supply for previously approved materials do not produce specified products, the CONTRACTOR shall furnish materials from other sources.

The CONTRACTOR shall furnish airport lighting equipment that conforms to the requirements of cited materials SPECIFICATIONS. In addition, where an FAA specification for airport lighting equipment is cited in the PLANS or SPECIFICATIONS, the CONTRACTOR shall furnish such equipment that is:

- A. Listed in FAA Advisory Circular (AC) 150/5345-53, Airport Lighting Equipment Certification Program, that is in effect on the date of advertisement; and,
- B. Produced by the manufacturer qualified (by FAA) to produce such specified and listed equipment.

60-2 SAMPLES, TESTS, AND CITED SPECIFICATIONS. Unless otherwise designated, all materials used in the work shall be inspected, tested, and approved by the ENGINEER before incorporation in the work. Any work in which untested materials are used without approval or written permission of the ENGINEER shall be performed at the CONTRACTOR's risk. Materials found to be unacceptable and unauthorized will not be paid for and, if directed by the ENGINEER, shall be removed at the CONTRACTOR's expense. Unless otherwise designated, tests in accordance with the cited standard methods of ASTM, AASHTO, Federal Specifications, Commercial Item Descriptions, and all other cited methods, which are current on the date of advertisement for bids, will be made by and at the expense of the ENGINEER. The testing organizations performing on site field tests shall have copies of all referenced standards on the construction site for use by all technicians and other personnel, including the CONTRACTOR's representative at his/her request. Unless otherwise designated, samples will be taken by a qualified representative of the ENGINEER. All materials being used are subject to inspection, test, or rejection at any time prior to or during incorporation into the work. Copies of all tests will be furnished to the CONTRACTOR's representative at his/her request.

The CONTRACTOR shall employ a testing organization to perform all CONTRACTOR required tests. The CONTRACTOR shall submit to the ENGINEER resumes on all testing organizations and individual persons who will be performing the tests. The ENGINEER will determine if such persons are qualified. All the test data shall be reported to the ENGINEER after the results are known. A legible, handwritten

copy of all test data shall be given to the ENGINEER daily, along with printed reports, in an approved format, on a weekly basis. After completion of the PROJECT, and prior to final payment, the CONTRACTOR shall submit a final report to the ENGINEER showing all test data reports, plus an analysis of all results showing ranges, averages, and corrective action taken on all failing tests.

60-3 CERTIFICATION OF COMPLIANCE. The ENGINEER may permit the use, prior to sampling and testing, of certain materials or assemblies when accompanied by manufacturer's certificates of compliance stating that such materials or assemblies fully comply with the requirements of the CONTRACT. The certificate shall be signed by the manufacturer. Each lot of such materials or assemblies delivered to the work must be accompanied by a certificate of compliance in which the lot is clearly identified.

Materials or assemblies used on the basis of certificates of compliance may be sampled and tested at any time and if found not to be in conformity with CONTRACT requirements will be subject to rejection whether in place or not.

The form and distribution of certificates of compliance shall be as approved by the ENGINEER.

When a material or assembly is specified by "brand name or equal" and the CONTRACTOR elects to furnish the specified "brand name", the CONTRACTOR shall be required to furnish the manufacturer's certificate of compliance for each lot of such material or assembly delivered to the work. Such certificate of compliance shall clearly identify each lot delivered and shall certify as to:

1. Conformance to the specified performance, testing, quality or dimensional requirements; and,
2. Suitability of the material or assembly for the use intended in the CONTRACT work.

Should the CONTRACTOR propose to furnish an "or equal" material or assembly, he shall furnish the manufacturer's certificates of compliance as previously described for the specified brand name material or assembly. However, the ENGINEER shall be the sole judge as to whether the proposed "or equal" is suitable for use in the work.

The ENGINEER reserves the right to refuse permission for use of materials or assemblies on the basis of certificates of compliance.

60-4 PLANT INSPECTION. The ENGINEER or his authorized representative may inspect, at its source, any specified material or assembly to be used in the work. Manufacturing plants may be inspected from time to time for the purpose of determining compliance with specified manufacturing methods or materials to be used in the work and to obtain samples required for his acceptance of the material or assembly.

Should the ENGINEER conduct plant inspections, the following conditions shall exist:

1. The ENGINEER shall have the cooperation and assistance of the CONTRACTOR and the producer with whom he has contracted for materials.
2. The ENGINEER shall have full entry at all reasonable times to such parts of the plant that concern the manufacture or production of the materials being furnished.
3. If required by the ENGINEER, the CONTRACTOR shall arrange for adequate office or working space that may be reasonably needed for conducting plant inspections. Office or working space should be conveniently located with respect to the plant.

It is understood and agreed that the OWNER shall have the right to retest any material which has been tested and approved at the source of supply after it has been delivered to the site. The ENGINEER shall

have the right to reject material which, when retested, does not meet the requirements of the CONTRACT, PLANS, or SPECIFICATIONS. All costs for retests may be charged to the CONTRACTOR.

60-5 ENGINEER'S FIELD OFFICE AND LABORATORY. The CONTRACTOR shall furnish a building for the exclusive use of the ENGINEER as a field office and field testing laboratory. The building shall be furnished and maintained by the CONTRACTOR and shall become property of the CONTRACTOR when the contract work is completed. Payment for this item shall be included in the lump sum price for mobilization. Refer to Division V, Section I, Paragraph 2.1.

60-6 STORAGE OF MATERIALS. Materials shall be so stored as to assure the preservation of their quality and fitness for the work. Stored materials, even though approved before storage, may again be inspected prior to their use in the work. Stored materials shall be located so as to facilitate their prompt inspection. The CONTRACTOR shall coordinate the storage of all materials with the ENGINEER. Materials to be stored on airport property shall not create an obstruction to air navigation nor shall they interfere with the free and unobstructed movement of aircraft. Unless otherwise shown on the PLANS, the storage of materials and the location of the CONTRACTOR's plant and parked equipment or vehicles shall be as directed by the ENGINEER. Private property shall not be used for storage purposes without written permission of the OWNER or lessee of such property. The CONTRACTOR shall make all arrangements and bear all expenses for the storage of materials on private property. Upon request, the CONTRACTOR shall furnish the ENGINEER a copy of the property OWNER's permission.

All storage sites on private or airport property shall be restored to their original condition by the CONTRACTOR at his entire expense, except as otherwise agreed to (in writing) by the OWNER or lessee of the property.

60-7 UNACCEPTABLE MATERIALS. Any material or assembly that does not conform to the requirements of the CONTRACT, PLANS, and SPECIFICATIONS shall be considered unacceptable and shall be rejected. The CONTRACTOR shall remove any rejected material or assembly from the site of the work, unless otherwise instructed by the ENGINEER.

No rejected material or assembly, the defects of which have been corrected by the CONTRACTOR, shall be returned to the site of the work until such time as the ENGINEER has approved its use in the work.

60-8 OWNER-FURNISHED MATERIALS. The CONTRACTOR shall furnish all materials required to complete the work, except those specified herein (if any) to be furnished by the OWNER. OWNER-furnished materials shall be made available to the CONTRACTOR at the location specified.

All costs of handling, transportation from the specified location to the site of work, storage, and installing OWNER-furnished materials shall be included in the unit price bid for the CONTRACT item in which such OWNER-furnished material is used.

After any OWNER-furnished material has been delivered to the location specified, the CONTRACTOR shall be responsible for any demurrage, damage, loss, or other deficiencies which may occur during the CONTRACTOR's handling, storage, or use of such OWNER-furnished material. The OWNER will deduct from any monies due or to become due the CONTRACTOR any cost incurred by the OWNER in making good such loss due to the CONTRACTOR's handling, storage, or use of OWNER-furnished materials.

60-9 TRADE NAMES AND ALTERNATIVES. For convenience in designation on the PLANS or in the SPECIFICATIONS, certain articles or materials to be incorporated in the work may be designated under a trade name or the name of a manufacturer and his catalogue information or followed by the words "or

equal". The use of an alternative article or material which is of equal quality and of the required characteristics for the purpose intended will be permitted, subject to the following requirements:

1. The burden of proof as to the quality and suitability of alternatives shall be upon the CONTRACTOR and he shall furnish all information necessary as required by the ENGINEER. The CONTRACTOR shall clearly flag all areas where the substituted unit differs from the specified material. The ENGINEER shall be the sole judge as to the quality and suitability of alternative articles or materials and his decision shall be final.
2. Whenever the SPECIFICATIONS permit the substitution of a similar or equivalent material or article, no tests or action relating to the approval of such substitute material will be made until the request for substitution is made in writing by the CONTRACTOR accompanied by complete data as to the equality of the material or article proposed. Such request shall be made in ample time to permit approval without delaying the work, but need not be made in less than 35 days after award of the CONTRACT.

60-10 BETTER MATERIAL OR PROCESS. In the event the CONTRACTOR furnishes a material, process or an article better than that specified, any difference in cost of such material, process or article so furnished shall be borne by the CONTRACTOR.

60-11 SHOP DRAWINGS AND SUBMITTALS. The CONTRACTOR, at his own expense, shall furnish for the approval of ENGINEER any and all shop drawings and other submittals required by the SPECIFICATIONS, or that may be requested by the ENGINEER, for any and all materials the CONTRACTOR proposes to use.

Shop drawings and submittals shall be submitted in quadruplicate and shall be marked with the name of the project and the name of the CONTRACTOR.

If the shop drawings or submittals show any variation from the CONTRACT requirements because of standard shop practice or other reason, specific mention of the variation shall be made in the letter of transmittal.

Approval of shop drawings and submittals will be general and shall not relieve the CONTRACTOR from the responsibility for proper fitting and construction of the work or from furnishing materials and work required by the CONTRACT which may not be indicated on shop drawings when approved, or from the responsibility for errors in the shop drawings. Shop drawing approval shall not be considered the basis for a CONTRACT change order.

60-12 MATERIALS LIST. The CONTRACTOR shall submit a complete list of all manufactured materials and equipment which he proposes to incorporate into the project to the ENGINEER for approval before placing his order for such materials or equipment. If the materials or equipment vary in any way from what was specified or shown on the PLANS, specific mention of the variation shall be made in the letter of transmittal.

60-13 GUARANTEE OF WORKMANSHIP AND MATERIALS AND DATE OF ACCEPTANCE. Besides guarantees required elsewhere, CONTRACTOR shall and does hereby guarantee all workmanship and materials for a period of one year, except as otherwise required in the CONTRACT for a longer period, from and after the date of acceptance of the Work and recordation of Notice of Completion by OWNER and shall repair or replace any or all workmanship and materials, together with any other work which may be displaced in so doing, that, in the opinion of the OWNER, is or becomes defective during the period of said guarantee without expense whatsoever to OWNER.

60-14 FORM OF GUARANTEES. Guarantees in the form of written warranty shall be supplied on the CONTRACTOR's own letterhead as follows:

WARRANTY FOR

We hereby warrant that the _____ has been installed accordance with the drawings and specification and that the work as installed will fulfill the requirements of the warranty included in the SPECIFICATIONS. We agree to repair or replace any or all of our work together with any other adjacent work which may be displaced by so doing, that may prove to be defective in its workmanship or materials for the period of one year from date of acceptance of the above mentioned structure by the OWNER, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with the above mentioned conditions within seven (7) days after being notified in writing we, collectively or separately, do hereby authorize the OWNER to proceed to have said defects repaired and made good at our expense, and we will honor and pay the cost and charges therefore on demand.

Signed: _____

CONTRACTOR

DIVISION III

SECTION 70

LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

70-1 LAWS TO BE OBSERVED. The CONTRACTOR shall keep fully informed of all Federal and State laws, all local laws, ordinances, and regulations and all orders and decrees of bodies or tribunals having any jurisdiction of authority, which in any manner affect those engaged or employed on the work, or which in any way affect the conduct of the work. He shall at all times observe and comply with all such laws, ordinances, regulations, orders, and decrees; and shall protect and indemnify the OWNER and all his officers, agents, or servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by himself or his employees.

70-2 PERMITS, LICENSES, AND TAXES. Unless modified by the Special Provisions, the CONTRACTOR shall procure all permits and licenses, pay all charges, fees, and taxes, and give all notices necessary and incidental to the due and lawful prosecution of the work.

70-3 PATENTED DEVICES, MATERIALS, AND PROCESSES. If the CONTRACTOR is required or desires to use any design, device, material, or process covered by letters of patent or copyright, he shall provide for such use by suitable legal agreement with the patentee or owner of the copyright. The CONTRACTOR and the surety shall indemnify and save harmless the OWNER, any third party or political subdivision from any and all claims for infringement by reason of the use of any such patented design, device, material or process, or any trademark or copyright, and shall indemnify the OWNER for any costs, expenses, and damages which it may be obliged to pay by reason of an infringement, at any time during the prosecution or after the completion of the work.

70-4 CONTRACTORS LICENSING LAWS. *Attention is directed to the provisions of Chapter 9 of Division 3 of the Business and Professions Code concerning the licensing of CONTRACTORS.*

All bidders and CONTRACTORS shall be licensed in accordance with the laws of the State of California and of the County of Riverside and any bidder or CONTRACTOR not so licensed is subject to the penalties imposed by such laws.

70-5 RESTORATION OF SURFACES DISTURBED BY OTHERS. The OWNER reserves the right to authorize the construction, reconstruction, or maintenance of any public or private utility service, FAA or National Oceanic and Atmospheric Administration (NOAA) facility, or a utility service of another government agency at any time during the progress of the work. To the extent that such construction, reconstruction, or maintenance has been coordinated with the OWNER, such authorized work (by others) is indicated as follows: NONE AT THIS TIME.

Except as listed above, the CONTRACTOR shall not permit any individual, firm, or corporation to excavate or otherwise disturb such utility services or facilities located within the limits of the work without the written permission of the ENGINEER.

Should the OWNER of public or private utility service, FAA, or NOAA facility, or a utility service of another government agency be authorized to construct, reconstruct, or maintain such utility service or facility during the progress of the work, the CONTRACTOR shall cooperate with such OWNERS by arranging and performing the work in this contract so as to facilitate such construction, reconstruction or maintenance by others whether or not such work by others is listed above. When ordered as extra work by the ENGINEER, the CONTRACTOR shall make all necessary repairs to the work which are due to

such authorized work by others, unless otherwise provided for in the CONTRACT, PLANS, or SPECIFICATIONS. It is understood and agreed that the CONTRACTOR shall not be entitled to make any claim for damages due to such authorized work by others or for any delay to the work resulting from such authorized work.

70-6 FEDERAL AID PARTICIPATION. For AIP contracts, the United States Government has agreed to reimburse the OWNER for some portion of the contract costs. Such reimbursement is made from time to time upon the OWNER's (sponsor's) request to the FAA. In consideration of the United States Government's (FAA's) agreement with the OWNER, the OWNER has included provisions in this CONTRACT pursuant to the requirements of the Airport Improvement Act of 1982, as amended by the Airport and Airway Safety and Capacity Expansion Act of 1987, and the Rules and Regulations of the FAA that pertain to the work.

As required by the Act, the contract work is subject to the inspection and approval of duly authorized representatives of the Administrator, FAA, and is further subject to those provisions of the rules and regulations that are cited in the CONTRACT, PLANS, or SPECIFICATIONS.

No requirement of the Act, the rules and regulations implementing the Act, or this CONTRACT shall be construed as making the Federal Government a party to the CONTRACT nor will any such requirement interfere, in any way, with the rights of either party to the CONTRACT.

70-7 SANITARY, HEALTH, AND SAFETY PROVISIONS. The CONTRACTOR shall provide and maintain in a neat, sanitary condition such accommodations for the use of his employees as may be necessary to comply with the requirements of the State and local Boards of Health, or of other bodies or tribunals having jurisdiction.

Attention is directed to Federal, State, and local laws, rules and regulations concerning construction safety and health standards. The CONTRACTOR shall not require any worker to work in surroundings or under conditions which are unsanitary, hazardous, or dangerous to his health or safety.

70-8 PUBLIC CONVENIENCE AND SAFETY. The CONTRACTOR shall control his operations and those of his subcontractors and all suppliers, to assure the least inconvenience to the traveling public. Under all circumstances, safety shall be the most important consideration.

The CONTRACTOR shall maintain the free and unobstructed movement of aircraft and vehicular traffic with respect to his own operations and those of his subcontractors and all suppliers in accordance with the subsection titled MAINTENANCE of TRAFFIC of Section 40, hereinbefore specified, and shall limit such operations for the convenience and safety of the traveling public as specified in the subsection titled LIMITATION OF OPERATIONS of Section 80 hereinafter.

70-9 BARRICADES, WARNING SIGNS, AND HAZARD MARKINGS. The CONTRACTOR shall furnish, erect, and maintain all barricades, warning signs, and markings for hazards necessary to protect the public and the work. When used during periods of darkness, such barricades, warning signs and hazard markings shall be suitably illuminated.

For vehicular and pedestrian traffic, the CONTRACTOR shall furnish, erect, and maintain barricades, warning signs, lights and other traffic control devices in reasonable conformity with the Manual of Uniform Traffic Control Devices for Streets and Highways (published by the United States Government Printing Office).

When the work requires closing an air operations area of the Airport or portion of such area, the CONTRACTOR shall furnish, erect, and maintain temporary markings and associated lighting conforming to the requirements of FAA Advisory Circular 150/5340-1F, Marking of Paved Areas on Airports.

The CONTRACTOR shall furnish, erect, and maintain markings and associated lighting of open trenches, excavations, temporary stock piles, and his parked construction equipment that may be hazardous to the operation of emergency fire-rescue or maintenance vehicles on the Airport in reasonable conformance to FAA Advisory Circular 150/5370-2E, Operational Safety on Airports With Emphasis on Safety During Construction.

All motorized equipment operating on the Airport shall be clearly marked with a 3-foot-square flag, consisting of a two-checked pattern of international orange and white squares of not less than one foot on each side, mounted on a staff to fly above the vehicle.

Vehicles and equipment operated during hours of sunset to sunrise or hours of restricted visibility due to fog shall be equipped with flashing lights.

The CONTRACTOR shall furnish and erect all barricades, warning signs, and markings for hazards prior to commencing work which requires such erection and shall maintain the barricades, warning signs, and markings for hazards until their dismantling is directed by the ENGINEER. No separate payment shall be made for furnishing, maintaining, moving, renting or purchasing barricades, warning signs and markings. All costs shall be included in the other items of work.

Open-flame type lights shall not be permitted within the air operations areas of the Airport.

70-10 USE OF EXPLOSIVES. No explosives shall be used on the Airport without approval of the ENGINEER. When the use of explosives is approved for the prosecution of the work, the CONTRACTOR shall exercise the utmost care not to endanger life or property, including new work. The CONTRACTOR shall be responsible for all damage resulting from the use of explosives.

All explosives shall be stored in a secure manner in compliance with all laws and ordinances, and all such storage places shall be clearly marked. Where no local laws or ordinances apply, storage shall be provided satisfactory to the ENGINEER and, in general, not closer than 1,000 feet from the work or from any building, road, or other place of human occupancy.

The CONTRACTOR shall notify each property OWNER and public utility company having structures or facilities in proximity to the site of the work of his intention to use explosives. Such notice shall be given sufficiently in advance to enable them to take such steps as they may deem necessary to protect their property from injury.

The use of electric blasting caps shall not be permitted on or within 1,000 feet of the airport property.

70-11 PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE. The CONTRACTOR shall be responsible for the preservation of all public and private property, and shall protect carefully from disturbance or damage all land monuments and property marks until the ENGINEER has witnessed or otherwise referenced their location and shall not move them until directed.

The CONTRACTOR shall be responsible for all damage or injury to property of any character, during the prosecution of the work, resulting from any act, omission, neglect, or misconduct in his manner or method of executing the work, or any time lost due to defective work or materials, and said responsibility will not be released until the project shall have been completed and accepted by the OWNER.

When or where and direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work, or in consequence of the nonexecution thereof by the CONTRACTOR, he shall restore, at his own expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, rebuilding, or otherwise restoring as may be directed, or he shall make good such damage or injury in an acceptable manner.

70-12 RESPONSIBILITY FOR DAMAGE CLAIMS. The CONTRACTOR shall indemnify and save harmless the ENGINEER and the OWNER and their officers, and employees from all suits, actions, or claims of any character brought because of any injuries or damage received or sustained by any person, persons, or property on account of the operations of the CONTRACTOR; or on account of or in consequence of any neglect, or misconduct of said CONTRACTOR; or because of any claims or amounts recovered from any infringements of patent, trademark, or copyright; or from any claims or amounts arising or recovered under the "Worker's Compensation Act", or any other law, ordinance, order, or decree. Money due the CONTRACTOR under and by virtue of his CONTRACT as may be considered necessary by the OWNER for such purpose may be retained for the use of the OWNER or, in case no money is due, his surety may be held until such suit or suits, action or actions, claim or claims for injuries or damages as aforesaid shall have been settled and suitable evidence to that effect furnished to the OWNER, except that money due the CONTRACTOR will not be withheld when the CONTRACTOR produces satisfactory evidence that he is adequately protected by public liability and property damage insurance.

70-13 THIRD PARTY BENEFICIARY CLAUSE. It is specifically agreed between the parties executing the CONTRACT that it is not intended by any of the provisions of any part of the CONTRACT to create the public or any member thereof a third party beneficiary or to authorize anyone not a party to the CONTRACT to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of the CONTRACT.

70-14 OPENING SECTIONS OF THE WORK TO TRAFFIC. Should it be necessary for the CONTRACTOR to complete portions of the CONTRACT work for the beneficial occupancy of the OWNER prior to completion of the entire CONTRACT, such "phasing" of the work shall be specified herein and indicated on the PLANS. When so specified, the CONTRACTOR shall complete such portions of the work on or before the date specified or as otherwise specified. The CONTRACTOR shall make his own estimate of the difficulties involved in arranging his work to permit such beneficial occupancy by the OWNER as described hereinafter on the PLANS.

Upon completion of any portion of the work listed above, such portion shall be accepted by the OWNER in accordance with the subsection titled PARTIAL ACCEPTANCE of Section 50.

No portion of the work may be opened by the CONTRACTOR for public use until ordered by the ENGINEER in writing. Should it become necessary to open a portion of the work to public traffic on a temporary or intermittent basis, such openings shall be made when, in the opinion of the ENGINEER, such portion of the work is in an acceptable condition to support the intended traffic. Temporary or intermittent openings are considered to be inherent in the work and shall not constitute either acceptance of the portion of the work so opened or waiver of any provision of the CONTRACT. Any damage to the portion of the work so opened that is not attributable to traffic which is permitted by the OWNER shall be repaired by the CONTRACTOR at his expense.

The CONTRACTOR shall make his own estimate of the inherent difficulties involved in completing the work under the conditions herein described and shall not claim any added compensation by reason of delay or increased cost due to opening a portion of the CONTRACT work.

70-15 CONTRACTOR'S RESPONSIBILITY FOR WORK. Until the ENGINEER's final written acceptance of the entire completed work, excepting only those portions of the work accepted in accordance with the subsection titled PARTIAL ACCEPTANCE Section 50-15, the CONTRACTOR shall have the charge and care thereof and shall take every precaution against injury or damage to any part due to the action of the elements or from any other cause, whether arising from the execution or from the nonexecution of the work. The CONTRACTOR shall rebuild, repair, restore, and make good all injuries or damages to any portion of the work occasioned by any of the above causes before final acceptance and shall bear the expense thereof except damage to the work due to unforeseeable causes beyond the control of and without the fault or negligence of the CONTRACTOR, including but not restricted to acts of God such as earthquake, tidal wave, tornado, hurricane or other cataclysmic phenomenon of nature, or acts of the public enemy or of governmental authorities.

If the work is suspended for any cause whatever, the CONTRACTOR shall be responsible for the work and shall take such precautions necessary to prevent damage to the work. The CONTRACTOR shall provide for normal drainage and shall properly and continuously maintain in an acceptable growing condition all living material in newly established plantings, seedings, and soddings furnished under his CONTRACT, and shall take adequate precautions to protect new tree growth and other important vegetative growth against injury.

70-16 CONTRACTOR'S RESPONSIBILITY FOR UTILITY SERVICE AND FACILITIES OF OTHERS. The CONTRACTOR shall cooperate with the OWNER of any public or private utility service, FAA or National Oceanic and Atmospheric Administration (NOAA), or a utility service, of another government agency that may be authorized by the OWNER to construct, reconstruct or maintain such utility services or facilities during the progress of the work. In addition, the CONTRACTOR shall control his operations to prevent the unscheduled interruption of such utility services and facilities.

To the extent that such public or private utility services, FAA, or NOAA facilities, or utility services of another governmental agency are known to exist within the limits of the CONTRACT work, the approximate locations have been indicated on the PLANS.

It is understood and agreed that the OWNER does not guarantee the accuracy or the completeness of the location information relating to existing utility services, facilities, or structures that may be shown on the PLANS or encountered in the work. Any inaccuracy or omission in such information shall not relieve the CONTRACTOR of his responsibility to protect such existing features from damage or unscheduled interruption of service.

It is further understood and agreed that the CONTRACTOR shall, upon execution of the CONTRACT, notify the OWNERS of all utility services or other facilities of his plan of operations. Such notification shall be in writing. A copy of each notification shall be given to the ENGINEER.

In addition to the general written notification hereinbefore provided, it shall be the responsibility of the CONTRACTOR to keep such individual OWNERS advised of changes in his plan of operations that would affect such OWNERS.

Prior to commencing the work in the general vicinity of an existing utility service or facility, the CONTRACTOR shall again notify each such owner of his plan of operation. If, in the CONTRACTOR'S

opinion, the OWNER's assistance is needed to locate the utility service or facility or the presence of a representative of the OWNER is desirable to observe the work, such advice should be included in the notification. Such notification shall be given by the most expeditious means to reach the utility OWNER no later than two normal business days prior to the CONTRACTOR's commencement of operations in such general vicinity. The CONTRACTOR shall furnish a written summary of the notification to the ENGINEER.

The CONTRACTOR's failure to give the two days' notice hereinabove provided shall be cause for the ENGINEER to suspend the CONTRACTOR's operations in the general vicinity of a utility service or facility.

Where the outside limits of an underground utility service has been located and staked on the ground, the CONTRACTOR shall be required to use excavation methods acceptable to the ENGINEER within 3 feet of such outside limits at such points as may be required to insure protection from damage due to the CONTRACTOR's operations.

Should the CONTRACTOR damage or interrupt the operation of a utility service or facility by accident or otherwise, he shall immediately notify the proper authority and the ENGINEER and shall take all reasonable measures to prevent further damage or interruption of service. The CONTRACTOR, in such events, shall cooperate with the utility service or facility owner and the ENGINEER continuously until such damage has been repaired and service restored to the satisfaction of the utility or facility owner.

The CONTRACTOR shall bear all costs of damage and restoration of service to any utility service or facility due to his operations whether or not due to negligence or accident. The OWNER reserves the right to deduct such costs from any monies due or which may become due the CONTRACTOR, or his surety.

70-17 FURNISHING RIGHTS-OF-WAY. The OWNER will be responsible for furnishing all rights-of-way upon which the work is to be constructed in advance of the CONTRACTOR's operations.

70-18 PERSONAL LIABILITY OF PUBLIC OFFICIALS. In carrying out any of the CONTRACT provisions or in exercising any power or authority granted to him by this CONTRACT, there shall be no liability upon the ENGINEER, his authorized representatives, or any official of the OWNER either personally or as an official of the OWNER. It is understood that in such matters they act solely as agents and representatives of the OWNER.

70-19 NO WAIVER OF LEGAL RIGHTS. Upon completion of the work, the OWNER will expeditiously make final inspection and notify the CONTRACTOR of final acceptance. Such final acceptance, however, shall not preclude or estop the OWNER from correcting any measurement, estimate, or certificate made before or after completion of the work, nor shall the OWNER be precluded or estopped from recovering from the CONTRACTOR or his surety, or both, such overpayment as may be sustained, or by failure on the part of the CONTRACTOR to fulfill his obligations under the CONTRACT. A waiver on the part of the OWNER of any breach of any part of the CONTRACT shall not be held to be a waiver of any other or subsequent breach.

The CONTRACTOR, without prejudice to the terms of the CONTRACT, shall be liable to the OWNER for latent defects, fraud, or such gross mistakes as may amount to fraud, or as regards the OWNER's rights under any warranty or guaranty.

70-20 ENVIRONMENTAL PROTECTION. The CONTRACTOR shall comply with all Federal, State, and local laws and regulations controlling pollution of the environment. He shall take necessary precautions to prevent pollution of streams, lakes, ponds, and reservoirs with fuels, oils, bitumens, chemicals, or other harmful materials and to prevent pollution of the atmosphere from particulate and gaseous matter.

No open burning will be permitted on the Airport without the approval of the OWNER.

Water sprinkler trucks shall be used to prevent and control dust on haul roads and in construction areas. In the event of strong winds during earthwork operations it may be necessary to suspend such operations until the conditions are favorable for such operation.

70-21 ARCHAEOLOGICAL AND HISTORICAL FINDINGS. Unless otherwise specified in this subsection, the CONTRACTOR is advised that the site of the work is not within any property, district or site, and does not contain any building, structure, or object listed in the current National Register of Historic Places published by the United States Department of Interior.

Should the CONTRACTOR encounter, during his operations, any building, part of a building, structure, or object which is incongruous with its surroundings, he shall immediately cease operations in that location and notify the ENGINEER. The ENGINEER will immediately investigate the CONTRACTOR's finding and will direct the CONTRACTOR to either resume his operations or to suspend operations as directed.

Should the ENGINEER order suspension of the CONTRACTOR's operations in order to protect an archaeological or historical finding, or order the CONTRACTOR to perform extra work, such shall be covered by an appropriate CONTRACT modification (change order or supplemental agreement) as provided in the subsection titled EXTRA WORK of Section 40 and subsection titled PAYMENT FOR EXTRA WORK AND FORCE ACCOUNT WORK of Section 90. If appropriate, the CONTRACT modification shall include an extension of CONTRACT time in accordance with the subsection titled DETERMINATION AND EXTENSION OF CONTRACT TIME of Section 80.

70-22 INSURANCE. *Without limiting CONTRACTOR's obligation to indemnify the SPONSOR, hereunder, CONTRACTOR shall maintain and keep in force during the term of this Agreement the following insurance:*

- A. *Bodily Injury and Property Insurance for all activities of the CONTRACTOR (and its subcontractors) arising out of or in connection with this Agreement, written on a Comprehensive General Liability form including, but not limited to, premises and operations, independent contractors, products and completed operations, contractual liability and personal injury, in an amount no less than One Million Dollars (\$1,000,000.00) combined single limit for each occurrence.*
- B. *Automobile Liability Insurance covering bodily injury and property damage for all activities of the CONTRACTOR arising out of or in connection with this Agreement including coverage for owned, hired, and non-owned vehicles, in an amount no less than One Million Dollars (\$1,000,000.00) combined single limit for each occurrence.*
- C. *Each said commercial general liability and automobile liability insurance policy shall be endorsed with the following specific language:*
 1. *The County of Riverside, their officers, agents, and employees, and Mead & Hunt, are named as additional insured for all liability arising out of the operations by or on behalf of the named insured in the performance of this Agreement.*

2. The inclusion of more than one insured shall not operate to impair the rights of one insured against another insured, and the coverages afforded shall apply as though separate policies had been issued to each insured.
 3. The insurance provided herein is primary and no insurance held or owned by County of Riverside shall be called upon to contribute to a loss.
 4. The coverage provided by this policy shall not be reduced or canceled without thirty (30) days written notice given to the County of Riverside
- D. Prior to commencement of any work under this CONTRACT, the CONTRACTOR shall provide proof of required insurance to the ENGINEER.
- E. Workers' Compensation insurance as required by the Labor Code of the State of California, for CONTRACTOR and employees of CONTRACTOR shall be provided by CONTRACTOR. All Workers' Compensation policies shall be endorsed with the following specific languages: "This policy shall not be canceled or materially changed without first giving thirty (30) days prior notice to County of Riverside in writing."

70-23 SAFETY. Provisions outlining the minimum requirements for Construction Safety and Phasing are contained in Division IV, Sections 1 and 2, and on the PLANS. The CONTRACTOR shall incorporate these minimum requirements into a comprehensive, project specific, Construction Safety Plan and submit that plan to the ENGINEER at the preconstruction meeting. The ENGINEER has not been retained or compensated to provide design and construction review services relating to the CONTRACTOR's safety precautions or to means, methods, techniques, sequences or procedures required for the CONTRACTOR to perform his work.

The CONTRACTOR will be solely and completely responsible for conditions of the work site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours. Safety provisions shall conform to all applicable state, county, and local laws, ordinances, and codes.

DIVISION III

SECTION 80

PROSECUTION AND PROGRESS

80-1 SUBLETTING OF CONTRACT. The OWNER will not recognize any subcontractor on the work. The CONTRACTOR shall at all times when work is in progress be represented either in person, by a qualified superintendent, or by other designated, qualified representative who is duly authorized to receive and execute orders of the ENGINEER.

Should the CONTRACTOR elect to assign his CONTRACT, said assignment shall be concurred in by the surety, shall be presented for the consideration and approval of the OWNER, and shall be consummated only on the written approval of the OWNER. In case of approval, the CONTRACTOR shall file copies of all subcontracts with the ENGINEER. The CONTRACTOR shall not assign more than 50% of the value of the CONTRACT work without prior express written consent of the OWNER.

80-2 NOTICE TO PROCEED. As soon as the contract documents have been signed by all parties, and approval has been obtained from the FAA, if necessary, the OWNER shall issue a Notice to Proceed with the work. The CONTRACT TIME shall begin on the date of the Notice unless the CONTRACTOR and OWNER mutually agree to another date which will be so stated in the Notice. The CONTRACTOR shall notify the ENGINEER at least 24 hours in advance of the time actual construction operations will begin.

80-3 PROSECUTION AND PROGRESS. Unless otherwise specified, the CONTRACTOR shall submit his progress schedule for the ENGINEER's approval within 10 days after the effective date of the Notice to Proceed. The CONTRACTOR's progress schedule, when approved by the ENGINEER, may be used to establish major construction operations and to check on the progress of the work. The CONTRACTOR shall provide sufficient materials, equipment, and labor to guarantee the completion of the Project in accordance with the PLANS and SPECIFICATIONS within the time set forth in the proposal.

If the CONTRACTOR falls significantly behind the submitted schedule, the CONTRACTOR shall, upon the ENGINEER's request, submit a revised schedule for completion of the work within the CONTRACT TIME and modify his operations to provide such additional materials, equipment, and labor necessary to meet the revised schedule. Should the work be discontinued for any reason, the CONTRACTOR shall notify the ENGINEER at least 24 hours in advance of resuming operations.

80-4 LIMITATION OF OPERATIONS. The CONTRACTOR shall control his operations and the operations of his subcontractors and all suppliers so as to provide for the free and unobstructed movement of aircraft in the AIR OPERATIONS AREAS of the Airport.

When the work requires the CONTRACTOR to conduct his operations within an AIR OPERATIONS AREA of the Airport, the work shall be coordinated with airport management (through the ENGINEER) at least 48 hours prior to commencement of such work. The CONTRACTOR shall not close an AIR OPERATIONS AREA until so authorized by the ENGINEER and until the necessary temporary marking and associated lighting is in place as provided in Division III, Section 70-9 titled BARRICADES, WARNING SIGNS, AND HAZARD MARKINGS.

The CONTRACTOR'S attention is drawn to Division IV, Special Provisions, for specific information on limitations and special requirement for construction in AIR OPERATIONS AREAS.

80-5 CHARACTER OF WORKERS, METHODS, AND EQUIPMENT. The CONTRACTOR shall, at all times, employ sufficient labor and equipment for prosecuting the work to full completion in the manner and time required by the CONTRACT, PLANS, and SPECIFICATIONS.

All workers shall have sufficient skill and experience to perform properly the work assigned to them. Workers engaged in special work or skilled work shall have sufficient experience in such work and in the operation of the equipment required to perform the work satisfactorily.

Any person employed by the CONTRACTOR or by any subcontractor who, in the opinion of the ENGINEER, does not perform his work in a proper and skillful manner or is intemperate or disorderly shall, at the written request of the ENGINEER, be removed forthwith by the CONTRACTOR or subcontractor employing such person, and shall not be employed again in any portion of the work without the approval of the ENGINEER.

Should the CONTRACTOR fail to remove such person or persons or fail to furnish suitable and sufficient personnel for the proper prosecution of the work, the ENGINEER may suspend the work by written notice until compliance with such orders.

All equipment which is proposed to be used on the work shall be of sufficient size and in such mechanical condition as to meet requirements of the work and to produce a satisfactory quality of work. Equipment used on any portion of the work shall be such that no injury to previously completed work, adjacent property, or existing airport facilities will result from its use.

When the methods and equipment to be used by the CONTRACTOR in accomplishing the work are not prescribed in the CONTRACT, the CONTRACTOR is free to use any methods or equipment that will accomplish the work in conformity with the requirements of the CONTRACT, PLANS, and SPECIFICATIONS.

When the CONTRACT specifies the use of certain methods and equipment, such methods and equipment shall be used unless others are authorized by the ENGINEER. If the CONTRACTOR desires to use a method or type of equipment other than specified in the CONTRACT, he may request authority from the ENGINEER to do so. The request shall be in writing and shall include a full description of the methods and equipment proposed along with the reasons for desiring to make the change. If approval is given, it will be on the condition that the CONTRACTOR will be fully responsible for producing work in conformity with CONTRACT requirements. If, after trial use of the substituted methods or equipment, the ENGINEER determines that the work produced does not meet CONTRACT requirements, the CONTRACTOR shall discontinue the use of the substitute method or equipment and shall complete the remaining work with the specified methods and equipment. The CONTRACTOR shall remove any deficient work and replace it with work of specified quality, or take such other corrective action as the ENGINEER may direct. No change will be made in the basis of payment for the CONTRACT items involved nor in CONTRACT TIME as a result of authorizing a change in methods or equipment under this subsection.

80-6 TEMPORARY SUSPENSION OF THE WORK. The ENGINEER shall have the authority to suspend the work wholly, or in part, for such period or periods as he may deem necessary, due to unsuitable weather, or such other conditions as are considered unfavorable for the prosecution of the work, or for such time as is necessary due to the failure on the part of the CONTRACTOR to carry out orders given or perform any or all provisions of the CONTRACT.

In the event that the CONTRACTOR is ordered by the ENGINEER, in writing, to suspend work for some unforeseen cause not otherwise provided for in the CONTRACT and over which the CONTRACTOR has no control, the CONTRACTOR may be reimbursed for actual money expended on the work during the period of shutdown. No allowance shall be made for anticipated profits. The period of shutdown shall be computed from the effective date of the ENGINEER's order to suspend work to the effective date of the ENGINEER's order to resume the work. Claims for such compensation shall be filed with the ENGINEER within the time period stated in the ENGINEER's order to resume work. The CONTRACTOR shall submit with his claim information substantiating the amount shown on the claim.

The ENGINEER will forward the CONTRACTOR's claim to the OWNER for consideration in accordance with local laws or ordinances. No provision of this article shall be construed as entitling the CONTRACTOR to compensation for delays due to inclement weather, for suspensions made at the request of the CONTRACTOR, or for any other delay provided for in the CONTRACT, PLANS, or SPECIFICATIONS.

If it should become necessary to suspend work for an indefinite period, the CONTRACTOR shall store all materials in such manner that they will not become an obstruction nor become damaged in any way. He shall take every precaution to prevent damage or deterioration of the work performed and provide for normal drainage of the work. The CONTRACTOR shall erect temporary structures where necessary to provide for traffic on, to, or from the Airport.

80-7 DETERMINATION AND EXTENSION OF CONTRACT TIME. The number of calendar or working days allowed for completion of the work shall be stated in the *Special Provisions* and shall be known as the CONTRACT TIME.

Should the CONTRACT TIME require extension for reasons beyond the CONTRACTOR's control, it shall be adjusted as follows:

- A. CONTRACT TIME based on WORKING DAYS shall be calculated weekly by the ENGINEER. The ENGINEER will furnish the CONTRACTOR a copy of his weekly statement of the number of working days charged against the CONTRACT TIME during the week and the number of working days currently specified for completion of the CONTRACT (the original CONTRACT TIME plus the number of working days, if any, that have been included in approved CHANGE ORDERS of SUPPLEMENTAL AGREEMENTS covering EXTRA WORK).

The ENGINEER shall base his weekly statement of CONTRACT TIME charged on the following considerations:

1. No time shall be charged for days on which the CONTRACTOR is unable to proceed with the principal item of work under construction at the time for at least 6 hours with the normal work force employed on such principal item. Should the normal work force be on a double-shift, 12 hours shall apply. Should the normal work force be on a triple-shift, 18 hours shall apply. Conditions beyond the CONTRACTOR's control such as strikes, lockouts, unusual delays in transportation, temporary suspension of the principal item of work under construction or temporary suspension of the entire work which have been ordered by the ENGINEER for reasons not the fault of the CONTRACTOR, shall not be charged against the CONTRACT TIME.

2. The ENGINEER will not make charges against the CONTRACT TIME prior to the date established by the Notice to Proceed.
 3. The ENGINEER will begin charges against the CONTRACT TIME on the first working day as established by the Notice to Proceed.
 4. The ENGINEER will not make charges against the CONTRACT TIME after the date of final acceptance as defined in the subsection titled FINAL ACCEPTANCE of Section 50.
 5. The CONTRACTOR will be allowed one week in which to file a written protest setting forth his objections to the ENGINEER's weekly statement. If no objection is filed within such specified time, the weekly statement shall be considered as acceptable to the CONTRACTOR.
- B. CONTRACT TIME based on CALENDAR DAYS shall consist of the number of calendar days stated in the CONTRACT counting from the effective date of the Notice to Proceed and including all Saturdays, Sundays, legal holidays, and non work days. All calendar days elapsing between the effective dates of the ENGINEER's orders to suspend and resume all work, due to causes not the fault of the CONTRACTOR, shall be excluded.
- C. When the CONTRACT TIME is a specified completion date, it shall be the date on which all CONTRACT work shall be substantially completed.

If the CONTRACTOR finds it impossible for reasons beyond his control to complete the work within the CONTRACT TIME as specified, or as extended in accordance with the provisions of this subsection, he may, at any time prior to the expiration of the CONTRACT TIME as extended and within the time limitations detailed below, make a written request to the ENGINEER for an extension of time setting forth the reasons which he believes will justify the granting of his request. The CONTRACTOR's plea that insufficient time was specified is not a valid reason for extension of time. If the ENGINEER finds that the work was delayed because of conditions beyond the control and without the fault of the CONTRACTOR, he may extend time for completion in such amount as the ENGINEER considers justified by the conditions. The extended time for completion shall then be in full force and effect, the same as though it were the original time for completion.

The CONTRACTOR shall not be entitled to and hereby expressly waives any extension of time resulting from any condition or cause unless said claim for extension of time is made in writing to the ENGINEER within seven days of the first instance of delay. Circumstances and activities leading to such claim shall be indicated or referenced in a daily field inspection report for the day(s) affected; otherwise, all such claims are waived by the CONTRACTOR. In every such written claim, the CONTRACTOR shall provide the following information:

1. Nature of the delay;
2. Date (or anticipated date) of commencement of delay;
3. Activities on the progress schedule affected by the delay, and/or new activities created by the delay and their relationship with existing activities;
4. Identification of person(s) or organization(s) or event(s) responsible for the delay;
5. Anticipated extent of the delay;

6. Recommended action to avoid or minimize the delay.

80-8 FAILURE TO COMPLETE ON TIME. *Time is of the essence hereof. For each calendar day or working day, as specified in the CONTRACT, that any work remains uncompleted after the CONTRACT TIME (including all extensions and adjustments as provided in the subsection titled DETERMINATION AND EXTENSION OF CONTRACT TIME of this Section), it is understood that OWNER will suffer damage; and it being impracticable and infeasible to determine the amount of actual damage, it is agreed that CONTRACTOR shall pay the OWNER as fixed and liquidated damages, and not as penalty, the amounts called for in the Special Provisions for each calendar day of delay until the work is completed and accepted, and CONTRACTOR and his surety shall be liable for the amount thereof; and the OWNER may deduct said sums from any money due or that may become due the CONTRACTOR; provided, however, that CONTRACTOR shall not be charged liquidated damages because of any delays in the completion of work due to unforeseeable causes beyond the control and without the fault or negligence of CONTRACTOR (including, but not restricted to, Acts of God or of the public enemy, acts of the Government, acts of the OWNER, fires, floods, epidemics quarantine restrictions, strikes, and freight embargoes).*

Permitting the CONTRACTOR to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, will in no way operate as a waiver on the part of the OWNER of any of its rights under the CONTRACT.

80-9 DEFAULT AND TERMINATION OF CONTRACT. The CONTRACTOR shall be considered in default of this CONTRACT and such default will be considered as cause for the OWNER to terminate the CONTRACT for any of the following reasons if the CONTRACTOR:

1. Fails to begin the work under the CONTRACT within the time specified in the Notice to Proceed, or
2. Fails to perform the work or fails to provide sufficient workers, equipment or materials to assure completion of work in accordance with the terms of the CONTRACT, or
3. Performs the work unsuitably or neglects or refuses to remove materials or to perform anew such work as may be rejected as unacceptable and unsuitable, or
4. Discontinues the prosecution of the work, or
5. Fails to resume work which has been discontinued within a reasonable time after notice to do so, or
6. Becomes insolvent or is declared bankrupt, or commits any act of bankruptcy or insolvency, or
7. Allows any final judgment to stand against him unsatisfied for a period of 10 days, or
8. Makes an assignment for the benefit of creditors, or
9. For any other cause whatsoever, fails to carry on the work in an acceptable manner.

Should the OWNER consider the CONTRACTOR in default of the CONTRACT for any reason hereinbefore, he shall immediately give written notice to the CONTRACTOR and the CONTRACTOR's surety as to the reasons for considering the CONTRACTOR in default and the OWNER's intentions to terminate the CONTRACT.

If the CONTRACTOR or surety, within a period of 10 days after such notice, does not proceed in accordance therewith, then the OWNER may, upon written notification from the ENGINEER of the facts of such delay, neglect, or default and the CONTRACTOR's failure to comply with such notice, have full

power and authority without violating the CONTRACT, to take the prosecution of the work out of the hands of the CONTRACTOR. The OWNER may appropriate or use any or all materials and equipment that have been mobilized for use in the work and are acceptable and may enter into an agreement with other contractors for the completion of said CONTRACT according to the terms and provisions thereof, or use such other methods as in the opinion of the ENGINEER will be required for the completion of said CONTRACT in an acceptable manner.

All costs and charges incurred by the OWNER, together with the cost of completing the work under CONTRACT, will be deducted from any monies due or which may become due the CONTRACTOR. If such expense exceeds the sum which would have been payable under the CONTRACT, then the CONTRACTOR and the surety shall be liable and shall pay to the OWNER the amount of such excess.

80-10 TERMINATION FOR NATIONAL EMERGENCIES. The OWNER shall terminate the CONTRACT or portion thereof by written notice when the CONTRACTOR is prevented from proceeding with the construction CONTRACT as a direct result of an Executive Order of the President with respect to the prosecution of war or in the interest of national defense.

When the CONTRACT, or any portion thereof, is terminated before completion of all items of work in the CONTRACT, payment will be made for the actual number of units or items of work completed at the CONTRACT price or as mutually agreed for items of work partially completed or not started. No claims or loss of anticipated profits shall be considered.

Reimbursement for organization of the work, and other overhead expenses (when not otherwise included in the CONTRACT), and moving equipment and materials to and from the job will be considered, the intent being that an equitable settlement will be made with the CONTRACTOR.

Acceptable materials, obtained or ordered by the CONTRACTOR for the work and that are not incorporated in the work shall, at the option of the OWNER, be purchased from the CONTRACTOR at actual cost as shown by receipted bills and actual cost records at such points of delivery as may be designated by the ENGINEER.

Termination of the CONTRACT or a portion thereof shall neither relieve the CONTRACTOR of his responsibilities for the completed work nor shall it relieve his surety of its obligation for and concerning any just claim arising out of the work performed.

DIVISION III
SECTION 90
MEASUREMENT AND PAYMENT

90-1 MEASUREMENT OF QUANTITIES. All work completed under the CONTRACT will be measured by the ENGINEER, or his authorized representatives, using United States Customary Units of Measurement.

The method of measurement and computations to be used in determination of quantities of material furnished and or work performed under the CONTRACT will be those methods generally recognized as conforming to good engineering practice.

Unless otherwise specified, longitudinal measurements for area computations will be made horizontally, and no deductions will be made for individual fixtures (or leave-outs) having an area of 9 square feet or less. Unless otherwise specified, transverse measurements for area computations will be the neat dimensions shown on the PLANS or ordered in writing by the ENGINEER.

Structures will be measured according to neat lines shown on the PLANS or as altered to fit field conditions.

Unless otherwise specified, all CONTRACT items which are measured by the linear foot such as electrical ducts, conduits, pipe culverts, underdrains, and similar items shall be measured parallel to the base or foundation upon which such items are placed.

In computing volumes of excavation the average end area method or other acceptable methods will be used at the option of the ENGINEER.

The thickness of plates and galvanized sheet used in the manufacture of corrugated metal pipe, metal plate pipe culverts and arches, and metal cribbing will be specified and measured in decimal fraction of inches.

The term "ton" will mean the short ton consisting of 2,000 pounds avoirdupois. All materials which are measured or proportioned by weights shall be weighed on accurate, approved scales by competent, qualified personnel at locations designated by the ENGINEER. If material is shipped by rail, the car weight may be accepted provided that only the actual weight of material be paid for. However, car weights will not be acceptable for material to be passed through mixing plants. Trucks used to haul material being paid for by weight shall be weighed empty daily at such times as the ENGINEER directs, and each truck shall bear a plainly legible identification mark.

Materials to be measured by volume in the hauling vehicle shall be hauled in approved vehicles and measured therein at the point of delivery. Vehicles for this purpose may be of any size or type acceptable to the ENGINEER, provided that the body is of such shape that the actual contents may be readily and accurately determined. All vehicles shall be loaded to at least their water level capacity and all loads shall be leveled when the vehicles arrive at the point of delivery.

When requested by the CONTRACTOR and approved by the ENGINEER in writing, material specified to be measured by the cubic yard may be weighed and such weights will be converted to cubic yards for payment purposes. Factors for conversion from weight measurement to volume measurement will be

determined by the ENGINEER and shall be agreed to by the CONTRACTOR before such method of measurement of pay quantities is used.

Bituminous materials will be measured by the gallon or ton. When measured by volume, such volumes will be measured at 60°F or will be corrected to the volume at 60°F using ASTM D 1250 for asphalts or ASTM D 633 for tars.

Net certified scale weights or weights based on certified volumes in the case of rail shipments will be used as a basis of measurement, subject to correction when bituminous material has been lost from the car of the distributor, wasted, or otherwise not incorporated in the work.

When bituminous materials are shipped by truck or transport, net certified weights by volume, subject to correction for loss or foaming, may be used for computing quantities at the option of the ENGINEER.

Cement will be measured by the ton or hundredweight.

Timber will be measured by the thousand feet board measure (M.F.B.M.) actually incorporated in the structure. Measurement will be based on nominal widths and thicknesses and the extreme length of each piece.

The term "lump sum" when used as an item of payment will mean complete payment for the work described in the CONTRACT.

When a complete structure or structural unit (in effect, "lump sum" work) is specified as the unit of measurement, the unit will be construed to include all necessary fittings and accessories.

Rental of equipment will be measured by time in hours of actual working time and necessary traveling time of the equipment within the limits of the work. Special equipment ordered by the ENGINEER in connection with force account work will be measured as agreed in the change order or supplemental agreement authorizing such force account work as provided in the subsection titled PAYMENT FOR EXTRA AND FORCE ACCOUNT WORK of this section.

When standard manufactured items are specified such as fence, wire, plates, rolled shapes, pipe conduit, etc., and these items are identified by gate, unit weight, section dimensions, etc., such identification will be considered to be nominal weights or dimensions. Unless more stringently controlled by tolerances in cited specifications, manufacturing tolerances established by the industries involved will be accepted.

Scales for weighing materials which are required to be proportioned or measured and paid for by weight shall be furnished, erected, and maintained by the CONTRACTOR, or be certified permanently installed commercial scales.

Scales shall be accurate within one-half percent of the correct weight throughout the range of use. The CONTRACTOR shall have the scales checked under the observation of the inspector before beginning work and at such other times as requested. The intervals shall be uniform in spacing throughout the graduated or marked length of the beam or dial and shall not exceed one-tenth of one percent of the nominal rated capacity of the scale, but not less than one pound. The use of spring balances will not be permitted.

Beams, dials, platforms, and other scale equipment shall be so arranged that the operator and inspector can safely and conveniently view them.

Scale installations shall have available, ten standard 50-pound weights for testing the weighing equipment or suitable weights and devices for other approved equipment.

Scales must be tested for accuracy and serviced before use at a new site. Platform scales shall be installed and maintained with the platform level and rigid bulkheads at each end.

Scales "overweighing" (indicating more than correct weight) will not be permitted to operate and all materials received subsequent to the last previous correct weighing accuracy test will be reduced by the percentage of error in excess of one-half of one percent.

In the event inspection reveals the scales have been "underweighing" (indicating less than correct weight) they shall be adjusted and no additional payment to the CONTRACTOR will be allowed for materials previously weighed and recorded.

All costs in connection with furnishing, installing, certifying, testing, and maintaining scales; for furnishing check weights and scale house; and for all other items specified in this subsection, for the weighing of materials for proportioning or payment, shall be included in the unit CONTRACT prices for the various items of the Project.

When the estimated quantities for a specific portion of the work are designated as the final pay quantities in the CONTRACT, they shall be the final quantities for which payment for such specific portion of the work will be made, unless the dimensions of said portions of the work shown on the PLANS are revised by the ENGINEER. If revised dimensions result in an increase or decrease in quantities of such work, the final quantities for payment will be revised in the amount represented by the authorized changes in the dimensions.

90-2 SCOPE OF PAYMENT. The CONTRACTOR shall receive and accept compensation provided for in the CONTRACT as full payment for furnishing all materials, for performing all work under the CONTRACT in a complete and acceptable manner, and for all risk, loss, damage, or expense of whatever character arising out of the nature of the work or the prosecution thereof, subject to the provisions of the subsection titled NO WAIVER OF LEGAL RIGHTS of Section 70.

When the "PAYMENT" subsection of a technical specification requires that the CONTRACT price (price bid) include compensation for certain work or material essential to the item, this same work or material will not also be measured for payment under any other CONTRACT item which may appear elsewhere in the CONTRACT, PLANS, or SPECIFICATIONS.

90-3 COMPENSATION FOR ALTERED QUANTITIES. When the accepted quantities of work vary from the quantities in the proposal, the CONTRACTOR shall accept as payment in full, so far as CONTRACT items are concerned, payment at the original CONTRACT price for the accepted quantities of work actually completed and accepted. No allowance, except as provided for in the subsection titled ALTERATION OF WORK AND QUANTITIES of Section 40, will be made for any increased expense, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the CONTRACTOR which results directly from such alterations or indirectly from his unbalanced allocation of overhead and profit among the CONTRACT items, or from any other cause.

90-4 PAYMENT FOR OMITTED ITEMS. As specified in the subsection titled OMITTED ITEMS of Section 40, the ENGINEER shall have the right to omit from the work (order nonperformance) any CONTRACT item, except major CONTRACT items, in the best interest of the OWNER.

Should the ENGINEER omit or order nonperformance of a CONTRACT item or portion of such item from the work, the CONTRACTOR shall accept payment in full at the CONTRACT prices for any work actually completed and acceptable prior to the ENGINEER's order to omit or nonperform such CONTRACT item.

Acceptable materials delivered on the work prior to the date of the ENGINEER's order will be paid for at the actual cost to the CONTRACTOR and shall there upon become the property of the OWNER.

In addition to the reimbursement hereinbefore provided, the CONTRACTOR shall be reimbursed for all actual costs incurred for the purpose of performing the omitted CONTRACT item prior to the date of the ENGINEER's order. Such additional costs incurred by the CONTRACTOR must be directly related to the deleted CONTRACT item and shall be supported by certified statements by the CONTRACTOR as to the nature and amount of such costs.

90-5 PAYMENT FOR EXTRA AND FORCE ACCOUNT WORK. Extra work, performed in accordance with the subsection titled EXTRA WORK of Section 40, will be paid for at the CONTRACT prices or agreed prices specified in a change order or supplemental agreement authorizing such extra work. *If an agreement is not reached on the prices for the extra work, the ENGINEER may require the work be done by force account.* All force account work shall be measured and paid for based on *direct costs of labor, equipment, and materials plus a mark-up allowance for overhead and profit as detailed in Subsection 90-5.1 and 90-5.2.* *The following provisions and conditions apply to all force account work:*

- A. Comparison of Records.** The CONTRACTOR and the ENGINEER shall compare records of the cost of force account work at the end of each day. *Agreement of the force account work done each day shall be indicated by signature of the CONTRACTOR and ENGINEER or their duly authorized representatives.*
- B. Statements.** No payment will be made for work performed on a force account basis until the CONTRACTOR has furnished the ENGINEER with duplicate itemized statements of the cost of such force account work detailed as follows:
- a. Name, classification, date, daily hours, total hours, rate and extension for each laborer and foreman.
 - b. Designation, dates, daily hours, total hours, rental rate, and extension for each unit for machinery and equipment.
 - c. Quantities of materials, prices, and extensions.
 - d. Transportation of materials.
 - e. Cost of property damage, liability and workmen's compensation insurance premiums, unemployment insurance contributions, and social security tax.

90-5.1 DIRECT COSTS.

A. Labor

1. *Cost of labor shall include any employer payments to or on behalf of workers for health, welfare, pension, vacation, and similar purposes. Labor rates will not be recognized when in excess of those prevailing in the locality at the time the work is being performed. No labor charges will be accepted for supervision. The costs for all superintendents and forepersons are included in the markups established by the Contract Documents. The only exception to*

this will be working forepersons who perform actual manual labor on the extra work. No labor charges will be accepted for engineering or proposal preparation. These costs are included in the markups established by the Contract Documents.

2. *Overtime and premium time pricing will only be allowed for labor which is performed after normal working hours at the ENGINEER's direction and written approval. If the CONTRACTOR chooses to work overtime without the ENGINEER's written approval, then overtime rates and premiums shall not apply.*

B. Material

1. *The actual cost to the CONTRACTOR for the materials directly required for the performance of the force account work. Such costs of materials may include the cost of transportation. No delivery charge will be allowed unless the delivery is specifically for the changed work.*
2. *If a trade discount by an actual supplier is available to the CONTRACTOR, it shall be credited to the COUNTY. If the materials are obtained from a supplier or source owned wholly by or in part by the CONTRACTOR, payment thereof will not exceed the current wholesale price for the materials. The term "trade discount" includes the concept of cash discounting.*
3. *If, in the opinion of the ENGINEER, the cost of the materials is excessive or if the CONTRACTOR fails to furnish satisfactory evidence of a cost to the CONTRACTOR from the actual supplier thereof, then, in either case, the cost of materials shall be deemed to be the lowest current wholesale price at which similar materials are available in the quantities required. The COUNTY reserves the right to furnish such materials as it deems advisable and the CONTRACTOR shall have no claims for cost or profits on materials furnished by the COUNTY.*

C. Equipment

1. *The actual cost to the CONTRACTOR for the use of equipment directly required in the performance of the force account work. In computing the hourly rental of equipment any time less than thirty (30) minutes shall be considered one-half hour. No payment will be made for time while equipment is inoperative due to breakdown or for non-working days. In addition, the rental time shall omit the time required to move the equipment to the work, for rental of such equipment, and to return it to the source. No mobilization or demobilization will be allowed for equipment already on site. If such equipment is not moved by its own power, then loading and transportation costs will be paid in lieu of rental time thereof. However, neither moving time nor loading and transportation costs will be paid if the equipment is used on the project in any way other than upon the changed work.*
2. *Individual pieces of equipment having a replacement value of \$1,000 or less shall be considered to be small tools or small equipment and no payment will be made thereof unless it is a direct expense for the changed work and is used for no other purpose.*
3. *The rental rate for equipment will not exceed that as recommended by the lower of the rental rates established by Caltrans or as contained in the Association of Equipment Distributors (AED) book.*
4. *The amount to be paid to the CONTRACTOR for the use of equipment as set forth above shall constitute full compensation to the CONTRACTOR for all costs incidental to the use of the equipment.*

90-5.2 COST MARKUPS.

- A. For work performed by the CONTRACTOR a 15% markup for overhead and profit will be added to the direct costs (as defined in Section 90-5.1) of the force account work.
- B. For work performed by a Subcontractor a 20% markup for overhead and profit will be added to the direct costs (as defined in Section 90-5.1) of the force account work. (Suggested breakdown: 15% to the Subcontractor, 5% to the CONTRACTOR.)
- C. For work performed by a Sub-Subcontractor (any tier) a 25% markup for overhead and profit will be added to the direct costs (as defined in Section 90-5.1) of the force account work. (Suggested breakdown: 15% to the Sub-subcontractor, 5% to the Subcontractor and 5% to the CONTRACTOR.)
- D. In no case will the total markups be greater than 25% of the direct cost notwithstanding the number of contract tier actually existing.
- E. On proposals covering both increases and decreases in the amount of the Contract Sum, overhead, profit and commission shall be allowed on the net increase only as determined above. Where the difference is a deletion, no percentage for overhead, profit or commission shall be allowed.
- F. The markup percentage shall be full compensation for profit, small tools, cleanup, engineering, supervision, warranties, job site overhead and home office overhead. No markup will be allowed on taxes, insurance and bonds.

90-5.3 CLAIMS FOR EXTRA COST. If the CONTRACTOR claims that any instructions by the ENGINEER results in work that is not described in the Contract Documents, involve extra cost under the Contract Documents, the CONTRACTOR shall give the ENGINEER written notice thereof within three (3) days after the receipt of such instructions and in any event before proceeding to execute the extra work, except in an emergency endangering life or property. No such claim shall be valid unless notification is so made.

90-5.4 CLAIMS FOR CONCEALED OR UNKNOWN CONDITIONS.

- A. The CONTRACTOR shall not be entitled to any adjustment in the Contract Sum or Contract Time for any concealed or unknown condition encountered in the performance of the Work if such condition: (1) is of a usual nature or does not differ materially from those ordinarily encountered and generally recognized as inherent to work of the nature provided for in the Contract Documents; (2) is of a usual nature or does not differ materially from those conditions disclosed or which could have been investigated or were reasonably inferable from the CONTRACTOR's prior work or should have been reasonably inferable by the CONTRACTOR from the Contract Documents and field conditions at the site of the project; or (3) is of a nature which the CONTRACTOR should reasonably have known or anticipated based on the area in which the site of the project is located, the type of construction involved and the practices prevalent in the construction industry.
- B. Notwithstanding the foregoing, however, if the CONTRACTOR makes a proper claim for an adjustment in the Contract Time or Contract Sum regarding special or concealed conditions which do not fall into the categories set forth above, the ENGINEER will promptly investigate such conditions. If such conditions differ materially and cause an increase or decrease in the CONTRACTOR's cost of,

or time required for, performance of any part of the Work, and the CONTRACTOR has timely and properly made its claim, the ENGINEER will recommend an equitable adjustment in the Contract Time or Contract Sum, or both. If the ENGINEER determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in either or both of the Contract Time and Contract Sum is justified, then the ENGINEER shall so notify the CONTRACTOR in writing, stating the reasons. For any claim for an adjustment in the Contract Time or Contract Sum to be made properly, such claim must be made by the CONTRACTOR in writing with specific detail as to the special or concealed condition and such notice shall be given to the ENGINEER promptly before conditions are disturbed and in no event later than three (3) days after first observance of any such conditions and if the CONTRACTOR is entitled to an adjustment in the Contract Time and/or Contract Sum, the CONTRACTOR shall make such claim within the three (3) day period. In no event shall the existence of any concealed or unknown conditions qualify or limit any of the CONTRACTOR's obligations under the Contract Documents, including, without limitation, the indemnity obligations set forth in the Agreement.

90-6 PARTIAL PAYMENTS. Partial payments will be made monthly as the work progresses. Said payments will be based upon estimates prepared by the ENGINEER of the value of the work performed and materials complete in place in accordance with the CONTRACT, PLANS, and SPECIFICATIONS. Such partial payments may also include the delivered actual cost of those materials stockpiled and stored in accordance with the subsection titled PAYMENT FOR MATERIALS ON HAND of this section.

No partial payment will be made when the amount due the CONTRACTOR since the last estimate amounts to less than Five Hundred Dollars (\$500.00).

From the total of the amount determined to be payable on a partial payment, 10% of such total amount will be deducted and retained by the OWNER until the final payment is made except, as may be provided (at the CONTRACTOR's option) in the subsection titled SUBSTITUTION OF SECURITIES of this section. The balance, 90% of the amount payable, less all previous payments, shall be certified for payment. Should the CONTRACTOR exercise his option, as provided in the subsection titled SUBSTITUTION OF SECURITY of this section, no such 10% retainage shall be deducted.

When 95% of the work has been completed, the ENGINEER may, at his discretion and with the consent of the surety, prepare an estimate from which will be retained an amount at least twice the CONTRACT value or estimated cost, whichever is greater, for the work remaining to be done. The remainder, less all previous payments and deductions, will then be certified for payment to the CONTRACTOR.

It is understood and agreed that the CONTRACTOR shall not be entitled to demand or receive partial payment based on quantities of work in excess of those provided in the proposal or covered by approved change orders or supplemental agreements, except when such excess quantities have been determined by the ENGINEER to be a part of the final quantity for the item of work in question.

No partial payment shall bind the OWNER to the acceptance of any materials or work in place as to quality or quantity. All partial payments are subject to correction at the time of final payment as provided in the subsection titled ACCEPTANCE AND FINAL PAYMENT of this section. CONTRACTOR acceptance of payments for undisputed contract amounts shall release the OWNER of all claims related to those amounts.

90-7 PAYMENT FOR MATERIALS ON HAND. Partial payments may be made to the extent of the delivered cost of materials to be incorporated in the work, provided that such materials meet the re-

quirements of the CONTRACT, PLANS, and SPECIFICATIONS. Such delivered costs of stored or stockpiled materials may be included in the next partial payment after the following conditions are met:

1. The material has been stored or stockpiled at a location acceptable to the OWNER and in a manner acceptable to the ENGINEER.
2. The CONTRACTOR has furnished the ENGINEER with acceptable evidence of the quantity and quality of such stored or stockpiled materials.
3. The CONTRACTOR has furnished the ENGINEER with satisfactory evidence that the material and transportation costs have been paid.
4. The CONTRACTOR has furnished the OWNER legal title (free of liens or encumbrances of any kind) to the material so stored or stockpiled.
5. The CONTRACTOR has furnished the OWNER evidence that the material so stored or stockpiled is insured against loss by damage to or disappearance of such materials at anytime prior to use in the work.
6. The CONTRACTOR shall bear all costs associated with the partial payment of stored or stockpiled materials in accordance with the provisions of this subsection.

It is understood and agreed that the transfer of title and the OWNER's payment for such stored or stockpiled materials shall in no way relieve the CONTRACTOR of his responsibility for furnishing and placing such materials in accordance with the requirements of the CONTRACT, PLANS, and SPECIFICATIONS. In no case will the amount of partial payments for materials on hand exceed the CONTRACT price for the CONTRACT items in which the material is intended to be used.

90-8 SUBSTITUTION OF SECURITIES. At the CONTRACTOR's option, he/she may request that the OWNER accept (in lieu of the 10% retainage on partial payments described in the subsection titled PARTIAL PAYMENTS of this section) the CONTRACTOR's deposits in escrow under the following conditions:

1. The CONTRACTOR shall bear all expenses of establishing and maintaining an escrow account and escrow agreement acceptable to the OWNER.
2. The CONTRACTOR shall deposit to and maintain in such escrow only those securities or bank certificates of deposit as are acceptable to the OWNER and having a value not less than the 10% retainage that would otherwise be withheld from partial payments.
3. The CONTRACTOR shall enter into an escrow agreement satisfactory to the OWNER.
4. The CONTRACTOR shall obtain the written consent of the surety to such agreement.

90-9 ACCEPTANCE AND FINAL ESTIMATE. When the CONTRACT work has been accepted in accordance with the requirements of the subsection titled FINAL ACCEPTANCE of Section 50, the ENGINEER will prepare the final estimate of the items of work actually performed. The CONTRACTOR shall approve the ENGINEER's final estimate or advise the ENGINEER of his objections to the final estimate which are based on disputes in measurements or computations of the final quantities to be paid under the CONTRACT as amended by order or supplemental agreement. The CONTRACTOR and ENGINEER shall resolve all disputes (if any) in the measurement and computation of final quantities to be paid within 30 calendar days of the CONTRACTOR's receipt of the ENGINEER's final estimate. If, after such 30-day period, a dispute still exists, the CONTRACTOR may approve the ENGINEER's estimate under protest of the quantities in dispute and such disputed quantities shall be considered by the OWNER

as a claim in accordance with the subsection titled CLAIMS FOR ADJUSTMENT AND DISPUTES of Section 50.

After the CONTRACTOR has approved, or approved under protest, the ENGINEER's final estimate, final payment will be processed based on the entire sum, or the undisputed sum in case of approval under protest, determined to be due the CONTRACTOR less all previous payments and all amounts to be deducted under the provisions of the CONTRACT. All prior partial estimates and payments shall be subject to correction in the final estimate and payment.

If the CONTRACTOR has filed a claim for additional compensation under the provisions of the subsection titled CLAIMS FOR ADJUSTMENTS AND DISPUTES of Section 50 or under the provisions of this subsection, such claims will be considered by the OWNER in accordance with local laws and ordinances. Upon final adjudication of such claims, any additional payment determined to be due the CONTRACTOR will be paid pursuant to a supplemental, final estimate.



DIVISION IV

**Special Provisions for
Airport Construction**

DIVISION IV

SECTION 1

SPECIAL PROVISIONS FOR AIRPORT CONSTRUCTION

1-1.1 SCOPE OF WORK. Sections 1 and 2 of Division IV provides for construction safety in an AIRPORT environment; limitations on construction operations; minimum requirements for construction management and scheduling; and site specific information pertaining to potential impacts on construction activities. All costs associated with related work shall be included in the various CONTRACT pay items and no additional compensation will be made.

1-1.2 SAFETY AND OPERATIONS PLAN. The CONTRACTOR shall comply with all provisions of FAA Advisory Circular AC 150/5370-2E and the Safety and Operations Plan included as Division IV, Section 2 of these SPECIFICATIONS. No separate measurement or payment shall be made for this item. All costs shall be included in other items of work.

1-1.3 CONSTRUCTION RELATED INFORMATION.

A. General. CONTRACTOR access to the various work areas shall be via the routes indicated on the Project Layout Plan. Access and haul routes on AIRPORT property are subject to approval by the COUNTY in accordance with provisions in Division IV, Section 2.

The CONTRACTOR is advised that airfield pavements are designed to support aircraft wheel loads and may not support fully-loaded construction equipment. The CONTRACTOR shall avoid crossing existing pavements as much as practical. The CONTRACTOR shall be responsible for any damage to existing pavement, lighting, or other existing facilities caused by construction activities. No direct payment shall be made for this work. All costs associated with complying with these Special Provisions shall be included in the various CONTRACT items unless specifically stated otherwise and no additional compensation will be made.

B. AIRPORT Security. AIRPORT security must be maintained at all times. The CONTRACTOR shall maintain control in accordance with Division IV, Section 2 to prevent unauthorized access onto AIRPORT property. Temporary fencing, gates, etc., shall be installed as necessary. No direct payment will be made for this work.

C. Operations on AIRPORT Property. The CONTRACTOR is advised that working within an AIRPORT environment has inherent limitations and special requirements with respect to safely conducting construction activities; coordinating construction with AIRPORT operations; and maintaining the construction site(s) in a condition that is compatible with aircraft. All costs associated with scheduling and performing construction activities around airfield operations shall be included in the price bid for the various CONTRACT items and no additional compensation will be made.

1-1.4 AIRPORT CLOSURE. The COUNTY intends to keep the AIRPORT open and operating throughout construction. Specific actions to allow continued AIRPORT operations and limitations on CONTRACTOR activities are detailed in Division IV, Section 2. The CONTRACTOR shall advise all workers and equipment operators to use extreme caution when working near the active airfield pavements. All equipment operators and workers shall visually check for approaching aircraft before

entering upon apron or taxiway surface, even when closed. Aircraft shall always be given the right-of-way.

1-1.5 LIMITATIONS ON CONSTRUCTION. See Division IV, Section 2 for details on construction limitations. Closure of existing airfield pavements will be allowed only if the following conditions are met:

- A. 48-hour advance notification.
- B. A closure schedule for each area of construction has been submitted to the ENGINEER for review and has been approved. These schedules shall detail temporary access routes (if applicable), safety measures, and time limits of closure for each area. Failure to open airfield pavements within the approved time limits may result in liquidated damages (see paragraph 1-1.8 below).
- C. **Pavement Closure Limitations.** *Pavement closure limitations for the AIRPORT shall be as specified below. The COUNTY's highest priority is to minimize impacts to AIRPORT operations during construction. The CONTRACTOR's schedule and sequence of work shall adhere to the time limits outlined herein.*
 - 1. *All work must be sequenced and scheduled as soon as the CONTRACTOR deems practical after the Notice to Proceed is issued and Mobilization is complete or as directed by the ENGINEER. Work must be completed within the allowed time of completion for the designated phase. Apron closure limitations for the various project phases must be complete and approved by the ENGINEER prior to starting next phase of work.*
 - 2. *Restricting access to FBOs and hangars is minimized as much as possible through phasing of work areas. Phasing is subject to ENGINEER's review and/or re-direction as necessary.*

1-1.6 WORK SCHEDULE AND SEQUENCING.

- A. **General.** Within ten (10) working days after the award of the CONTRACT, the CONTRACTOR shall submit to the ENGINEER a work plan and schedule for accomplishment of all work called for by the CONTRACT. The schedule shall clearly show the CONTRACTOR's method of compliance with the time limitations specified in Section 1.7 below, within the framework of the general sequencing of the work as outlined herein. The CONTRACTOR shall sequence the work to minimize disruption of AIRPORT operations.

The COUNTY shall have final approval on the CONTRACTOR's schedule and sequencing. The CONTRACTOR shall provide the COUNTY with an updated schedule weekly. The COUNTY will use the updated schedule to issue Notices to Airmen and coordinate construction activity with airfield users. No direct payment shall be made for scheduling and sequencing required in this section. All costs associated therewith shall be included in the various CONTRACT items and no additional compensation will be made.

1-1.7 TIME LIMITATIONS. The overall time of completion for this PROJECT is **fifty-eight (58)** working days. Should this time schedule not be met, liquidated damages of **\$1,500** per calendar day will be assessed. Additionally, the following limitations shall apply:

- A. **Mobilization – Fifteen (15) Working Days.** Notice to Proceed with Mobilization shall be given immediately after award of CONTRACT. All work included in Mobilization shall be completed within fifteen (15) working days. Within this time limitation the CONTRACTOR shall be allowed short-term access to perform preparatory work within the RWA. (See Division IV, Section 2-1.5D.)

- B. **Bid Schedule A.** Notice to Proceed with Bid Schedule A work shall be issued at the at the COUNTY's discretion after the start of Mobilization. All work included in Bid Schedule A shall be completed within **eighteen (18)** working days. The CONTRACTOR will coordinate their work schedule to minimize impact to AIRPORT operations and aircraft owners. See Section 1-1.5C for Pavement Closure Limitations.
- C. **Bid Alternate A.** If Bid Alternate A is awarded, an additional **three (3)** working days will be added to the CONTRACT.
- D. **Bid Schedule B.** **Eight (8)** working days.
- E. **Bid Schedule C.** **Seven (7)** working days.
- F. **Bid Schedule D.** **Ten (10)** working days.

1-1.8 LIQUIDATED DAMAGES. If the overall time limitation for any phase of work not be met, liquidated damages of **\$1,500** per calendar day will be assessed. The COUNTY, at its own discretion, may allow additional time for delays caused by phasing requirements contained herein or by factors beyond the CONTRACTOR's control.

1-1.9 MARKING OF CONSTRUCTION EQUIPMENT. All construction equipment shall display orange and white checkered flags, 3 feet by 3 feet, or flashing amber lights. These devices shall be located on the equipment so as to be plainly visible to aircraft. No construction equipment shall be parked on the paved areas of the AIRPORT. Parking areas for equipment will be designated by the COUNTY. Flashing lights are required for night operations.

1-1.10 BARRICADES. The COUNTY shall provide one hundred twenty (120), 8-foot long, low profile, Multi- Barrier model AR-10 x 96 barricades, as manufactured by Sherwin Industries, Inc. or approved equal. They shall be equipped with reflective striping on each side and with two (2) flashing, solar-powered lights.

Additionally the CONTRACTOR shall provide plastic delineators as required to barricade hazardous areas. Unless otherwise approved by the ENGINEER, barricades shall be 42-inch-high molded plastic delineators. Delineators shall be four inches in diameter, florescent orange, supplied with a weighted base and reflective stripes. Lighting for barricades will be provided at night as approved by the ENGINEER. All costs associated with this item shall be included in Airfield Safety and Traffic Control.

1-1.11 EXISTING FACILITIES. The CONTRACTOR is advised that there are numerous underground utilities in the construction area; the locations of known facilities are shown in the position estimated from available records. Although efforts have been made to locate these facilities as accurately as possible, the locations shown are approximate only. The CONTRACTOR's shall carefully field locate these facilities as directed by the ENGINEER or at the CONTRACTOR's discretion. Should any of the facilities be damaged or broken as a result of the CONTRACTOR's operations, they shall promptly be repaired at the CONTRACTOR's expense. The costs associated with potholing or otherwise locating existing underground facilities shall be included in the lump sum price for site preparation.

Airfield Electrical — there are numerous airfield electrical systems in the construction areas. The CONTRACTOR shall protect these facilities and maintain the continuity of these circuits throughout

construction, unless otherwise approved by the ENGINEER. The runway lights shall be operational whenever the runway is open for night operation. Temporary wiring and power shall be provided as necessary.

1-1.12 LINES AND GRADES. The CONTRACTOR shall provide construction and layout staking in accordance with Division III, Section 50-6 of these SPECIFICATIONS. The CONTRACTOR shall protect and preserve all marks set by others and shall be liable for replacement of marks destroyed during construction. The ENGINEER will be given 48 hours' notice of subgrade, aggregate subbase, and aggregate base completion so finished grades may be checked. No direct payment will be made for this work. The CONTRACTOR shall include the associated costs in the various CONTRACT items and no additional compensation shall be made.

1-1.13 WORK LIMITATIONS. With the exception of the specified night work, the AIRPORT's normal work hours are from 7:00 a.m. to 4:00 p.m., PST, Monday through Friday, excluding holidays. All work performed outside of this schedule shall be coordinated and approved in advance by the ENGINEER. The CONTRACTOR will be charged for work performed outside of this schedule that requires inspection or observation by the ENGINEER or AIRPORT staff. The rate for ENGINEER or AIRPORT personnel is \$135.00 per hour including expenses.

1-1.14 EMERGENCY AIR OPERATIONS. During CDF, U.S. Forest Service or any other emergency air operations, the CONTRACTOR may be instructed to cease work or vacate specific areas of the AIRPORT. Any delays caused by ordered cessation of work shall be grounds for time extensions, as approved by the ENGINEER. No additional payment shall be allowed for emergency cessation of work.

1-1.15 RECORD DRAWINGS. The CONTRACTOR shall maintain record drawings of all work continuously as the job progresses. A separate set of prints, for this purpose only, shall be kept at the job site at all times. It shall be required that these drawings be up to date and be reviewed by the field inspector at the time each progress bill is submitted. All deviations from the drawings, exact locations and sizes of all utilities, mechanical and electrical lines, equipment details, and all stub outs and connections for future expansion, shall be incorporated.

1-1.16 SAFETY AND POLLUTION. The CONTRACTOR shall comply with all applicable pollution control regulations including Section 7-1.01F (Air Pollution Control) of the State Standard Specifications, Section 11017 of the Government Code, and all requirements of Sections 1-1.18 and 1-1.19 of these SPECIFICATIONS. The CONTRACTOR shall comply with all conditions regarding water pollution requirements of Section 7-1.01G (Water Pollution) of the State Standard Specifications and all regulations and orders issued by the COUNTY. The spilling of oil, gas, diesel, hydraulic fluid, or any other substance harmful to the fish or plant life in any drainage areas is prohibited.

1-1.17 DUST CONTROL. Dust control shall be in conformance with Section 10, "Dust Control" of the State Standard Specifications, Riverside County Dust Ordinance, and these Special Provisions. The CONTRACTOR shall provide the ways and means to prevent dust, grit and other waste products from becoming a nuisance in and around the working areas. The CONTRACTOR shall take action as necessary, with the approval of the ENGINEER, to reduce or eliminate such nuisance. The CONTRACTOR shall control dust during the entire CONTRACT period, including holidays and weekends.

Application of water for controlling dust caused by construction operations or the passage of traffic through the work area(s) shall be applied as directed by the ENGINEER, be at the CONTRACTOR's expense.

If the CONTRACTOR fails to control dust in accordance with these Special Provisions, the COUNTY reserves the right to hire another CONTRACTOR or agency to perform this work on a "force account" basis. Total cost for performing this work will be deducted from the total CONTRACT price at final payment.

1-1.18 STORM WATER DISCHARGE PERMIT (Construction NPDES).

- A. Construction activity under this PROJECT will be subject to requirements of the State Water Resources Control Board (SWRCB), General Permit No. CAS 000002, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activity, (Permit). The Permit requires that a Storm Water Pollution Prevention Plan (SWPPP) be prepared and implemented during construction of this PROJECT. The CONTRACTOR shall comply with all terms and conditions of this Permit during construction. The CONTRACTOR shall be solely responsible for compliance and should any sanctions, fines, penalties, or other actions be taken against the COUNTY as a result of the CONTRACTOR'S failure to meet the terms and conditions. The CONTRACTOR shall be held totally responsible for all damages to the COUNTY, including fines, fees, court costs, or any other charges that may be brought against the COUNTY as a result of the violation.
- B. The COUNTY will submit to the SWRCB, a certified Notice of Intent (NOI) to comply with the General Permit No. CAS 000002 for the discharge of storm water from the construction site during the construction of the PROJECT. Prior to CONTRACTOR commencing work, a completed and certified Storm Water Pollution Prevention Plan (SWPPP) will be provided by the CONTRACTOR. The SWPPP shall be kept on file at the construction site for the duration of the PROJECT.
- C. The Best Management Practices (BMP) measures called for in these Bid Documents and the SWPPP shall be considered a minimum. The CONTRACTOR shall be required to comply with all BMP provisions in the CONTRACT, and shall implement additional and ongoing BMP measures as deemed necessary to comply with the Permit. No direct payment will be made for the BMPs called for on the PLANS. The cost of this work shall be included in the lump sum price for miscellaneous site preparation and no additional compensation will be made.
- D. Should the COUNTY require additional work beyond what is shown on the PLANS in order to comply with the SWPPP, the CONTRACTOR shall be paid for such work on a time-and-materials basis. A budget of \$8,000 has been included on the Proposal Form for this work and the 25 percent change in quantity limitation is waived. Should the COUNTY determine that no additional SWPPP construction is required; this item shall be deleted from the CONTRACT.

1-1.19 CONSTRUCTION WATER. The source of construction water for the PROJECT shall be coordinated by the CONTRACTOR. The CONTRACTOR shall pay water and meter fees; and make all necessary arrangements with appropriate local utility to secure construction water for the duration of the CONTRACT. No direct payment will be made for this work. The CONTRACTOR shall include all costs associated with construction water in the price of the work.

1-1.20 PRECONSTRUCTION CONFERENCE. Prior to the commencement of work at the site, a preconstruction conference will be held at a mutually agreed time at the AIRPORT which shall be attended by the CONTRACTOR's PROJECT management team, including the superintendent, and all primary subcontractors. Other attendees will be:

1. ENGINEER and the Resident PROJECT Representative.
2. Representatives of the AIRPORT and COUNTY.
3. FAA and other agency representatives, as appropriate.

Unless previously submitted to the ENGINEER, the CONTRACTOR shall bring to the conference five (5) copies each of the following:

1. A preliminary construction schedule, in critical path format, showing the start of all work items and their duration.
2. Procurement schedule of major equipment and materials and items requiring long lead time.
3. A schedule for submittal of AC mix design and other required material and/or equipment submittals.
4. Emergency contacts for CONTRACTOR after business hours.

At the Preconstruction Conference the COUNTY will provide the CONTRACTOR with five (5) sets of the PLANS and SPECIFICATIONS.

The purpose of the conference is to identify key PROJECT personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. The agenda will include the following:

1. PROJECT administration.
2. CONTRACTOR's preliminary schedule(s).
3. Closure periods and critical work sequencing.
4. AIRPORT operational requirements.
5. Field decisions and change orders.
6. Use of PROJECT site, staging areas, security, haul routes, and housekeeping.
7. Major work priorities.

1-1.21 WEEKLY CONSTRUCTION MEETING. A construction meeting shall be held weekly to discuss and coordinate construction activity. The CONTRACTOR's superintendent and subcontractors, as appropriate, shall attend the meeting. The meeting shall be held on the AIRPORT at a regular time as agreed upon by the CONTRACTOR and COUNTY.

1-1.22 CERTIFIED PAYROLL REQUIREMENTS. The CONTRACTOR shall submit two (2) copies of all certified payroll, including subcontractors, to the ENGINEER each month. Failure to submit complete certified payroll in a timely manner may delay progress payments. For certified payroll to be considered for review, the submittal must contain the following information in a clear, logical manner:

- A. A weekly payroll record showing the name, address, social security number, appropriate work classification (title and group number indicated in the applicable wage rates; see Division II, Section 5), straight time and overtime hours worked, and the actual wages paid. Optional Form WH-347 is available for this purpose.

- B. Each payroll submitted shall be accompanied by a "Statement of Compliance", signed by the agent who pays or supervises the payment of the persons employed under the CONTRACT and shall certify the following:
 - " . . . that each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the CONTRACT."
- C. A fringe benefit statement showing appropriate fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the CONTRACT.

For additional information on payroll records and reporting requirements, refer to Division II, pages 2-6 through 2-11.

END OF SECTION

DIVISION IV

SECTION 2

CONSTRUCTION SAFETY AND OPERATIONS REQUIREMENTS

2-1.1 CONTRACTOR COMPLIANCE. The CONTRACTOR shall comply with all requirements of the Construction Safety and Phasing Plan (CSPP) and FAA Advisory Circular 150/5370-2E, "Operational Safety On Airports During Construction," included as *Appendix A* to this section.

All associated costs shall be included in work paid for under Airfield Safety and Traffic Control.

2-1.2 GENERAL SAFETY REQUIREMENTS. Throughout the construction PROJECT, the following safety and operational practices should be observed:

- A. Operational safety will be a standing agenda item during weekly safety and progress meetings throughout the construction PROJECT.
- B. The CONTRACTOR and Airport shall perform onsite inspections throughout the project, with immediate remedy of any deficiencies, whether caused by negligence, oversight, or project scope change.
- C. Airport runways and taxiways will remain in use by aircraft to the maximum extent possible.
- D. Aircraft use of areas near the CONTRACTOR's work will be controlled to the extent possible to minimize disturbance to the CONTRACTOR's operation.
- E. CONTRACTOR, subcontractor, and supplier employees or any unauthorized persons must be restricted from entering an Airport area that would be hazardous.
- F. Construction within the restricted work area (RWA) limits of any runway, taxiway, or apron shall be subject to the limitations contained in this section. Access to RWAs requires prior permission from the Airport operator.
- G. The Airport may order the CONTRACTOR to suspend operations; move personnel, equipment, and materials to a safe location; and stand by until aircraft use is completed.

2-1.3 EMERGENCY NUMBERS

Police, Fire, Rescue – 911

Airport Operations – Chad Davies, (951) 955-9417

Engineering – Mead & Hunt (707) 526-5010

2-1.4 RESTRICTED WORK AREAS (RWA).

- A. **Runways.** No construction activity is allowed within 500 feet of the runway end or within 125 feet of the runway centerline without runway closure, temporary threshold displacement, or other as described in Section 2-1.5.
- B. **Taxiways.** No construction activity is allowed within 50 feet of a taxiway centerline without taxiway closure or other measures as described in Section 2-1.5.
- C. **Aprons.** Construction activities shall be scheduled in accordance with the phasing requirements shown on the PLANS and as described in these SPECIFICATIONS.
- D. **Drop Edges/Trenches.** The CONTRACTOR shall not leave open trenches or drop edges greater

than 3 inches in the RWA adjacent to or crossing existing pavements, at the end of the working day. Trenches through existing pavements shall be backfilled or otherwise made safe by the end of work each day. Drop edges shall be eliminated, as approved by the ENGINEER, by the end of each work day. Lighted barricades shall be provided as directed by the ENGINEER.

2-1.5 CONSTRUCTION LIMITATIONS WITHIN RESTRICTED WORK AREAS.

A. Runways.

1. Work within the RWA of a runway 5-23 is not allowed. No closure of the runway is planned or intended.

B. Taxiways.

1. The CONTRACTOR is not allowed to work in the Restricted Work Area (RWA) without runway closure or other measures described herein. Daytime closure of this Taxiways B and C will be allowed. When taxiway closure is required, low-profile barricades shall be placed in conformance with Division IV, Section 1. The taxiway shall be open and operational at the end of each closure period.
2. Special time restrictions and liquidated damages shall apply to this work as detailed in Division IV, Section 1.

C. Apron.

1. No work is allowed without closure of the affected areas.
2. The CONTRACTOR shall barricade the work area as directed by the ENGINEER, shown on the PLANS, and in conformance with Division IV, Section 1.
3. To the extent possible, air traffic will be routed around the work areas.
4. Flaggers shall be provided as necessary.

D. Short Term RWA Access.

Short duration (5-15 minutes) time access to the taxiway will be allowed on a case-by-case basis at the COUNTY's discretion. Minor work elements within the RWA, such as surveying or other similar operations can be accomplished during the day light hours under radio control as approved by the AIRPORT. For this work, the CONTRACTOR shall be cleared into the restricted area between aircraft operations. As required, the CONTRACTOR shall, upon notification, immediately vacate the restricted area to allow aircraft operations to continue.

2-1.6 MARKING OF HAZARDOUS AREAS. Hazardous areas on or near active airfield pavements shall be marked with barricades as approved by the ENGINEER. Barricaded areas shall be lighted at night with red hazard lights. Barricades shall be in conformance with Division IV, Section 1-1.10 of these SPECIFICATIONS.

2-1.7 RADIO COMMUNICATION WITH ATC TOWER. All traffic on the AIRPORT, including aircraft and motor vehicles, are uncontrolled. The CONTRACTOR shall have on-site at all times an aviation radio, which receives and transmits on a frequency of 123.0.

Two-way radio communication with taxiing aircraft shall be maintained at all times when working or traveling in a controlled area. The CONTRACTOR shall supply radios and personnel capable of communication with aircraft during the hours of construction. The CONTRACTOR will also be required to monitor communications during all construction hours. When the apron or taxiway is open to air traffic,

CONTRACTOR must provide a radio-equipped escort before any of his personnel or equipment proceeds onto or across the taxiway or apron. If the CONTRACTOR is working in more than one location, each work area shall have a radio as directed by the ENGINEER. A radio-equipped flagman shall be used to control vehicular traffic crossing active areas during hauling operations. Radio Operations Personnel shall be trained by AIRPORT personnel, prior to using radios.

The CONTRACTOR shall provide at least two (2) fully functional hand-held aviation radios with battery chargers for use during construction. Radios shall be (2) ICOM-A6 transceivers, each supplied with NICAD battery pack, spare NICAD battery pack, whip antenna, desktop charger, and a 12V adaptor/charger. These two radios shall be given to the COUNTY upon completion of the project. If more than two radios are required, the CONTRACTOR shall supply them at his own expense.

2-1.8 VEHICLE OPERATION, MARKING AND CONTROL.

- A. Marking of Construction Equipment.** All construction vehicles and equipment shall display flashing amber roof lights or orange-and-white checkered flags, three feet by three feet. For night operations, all vehicles and equipment shall display flashing amber lights. Flags and lights shall be located on the equipment so as to be plainly visible to aircraft.
- B. Vehicle Operations on the AIRPORT.**
1. Prior to construction, all personnel who will be driving on the AIRPORT shall attend a training program which covers procedures for operating motor vehicles within the air operations area (2 to 3 hour class). The program will be given by AIRPORT personnel at no charge to the CONTRACTOR. Material delivery or occasional drivers need not receive training provided they have a trained escort.
 2. The maximum operating speed on the AIRPORT is 15 miles per hour.
 3. Aircraft shall have the right of way at all times. Vehicles shall yield the right of way to aircraft and maneuver clear of the airfield surface as required to allow the passage of aircraft.
 4. Except when operating within barricaded construction areas, all vehicles and pedestrians must obtain a radio clearance from the air traffic control tower before entering any active runway, taxiway, or apron.
- C. Involvement in Vehicle Accidents.** Any persons damaging any airfield light fixture or other AIRPORT facility shall report such damage to the AIRPORT immediately and shall be responsible for any costs required to repair or replace the damaged fixture or facility.
- D. Parking Vehicles.** Areas designated for vehicle parking and staging of equipment shall be as shown on the PLANS or as approved by the AIRPORT.

2-1.9 ACCESS AND SECURITY.

- A. CONTRACTOR Access.** CONTRACTOR access to the various work areas shall be via the closest access routes indicated on the Project Layout Plan. Haul routes on AIRPORT property shall be approved by the AIRPORT. All access routes and haul roads shall be kept clean and free of debris. Dust control shall be maintained. Where haul routes cross active runways, taxiways, or aprons, radio-equipped flaggers shall be provided by the CONTRACTOR as required.
- B. Access Control.**
1. The CONTRACTOR shall be responsible for maintaining AIRPORT security at all gates designated for his use. Gates must be locked or manned by the CONTRACTOR's personnel to ensure no

unauthorized access to the air operations area.

2. All access gates shall be kept clear of equipment and material.

C. Security Violations

1. The CONTRACTOR is responsible for maintaining security during construction as detailed herein.

2. The AIRPORT is subject to fines up to \$20,000 for security violations. The CONTRACTOR shall be responsible for any fines caused by his failure to observe the security requirements contained herein or required by the COUNTY.

3. No direct payment shall be made for items contained in this section.

2-1.10 DEBRIS (FOD). The CONTRACTOR is responsible for ensuring that all airfield pavement is free from waste, loose material and other debris. The CONTRACTOR shall have sweeping or vacuuming capabilities on-site in order to remove debris as it occurs. The CONTRACTOR shall be responsible for any damage to aircraft caused by FOD resulting from his operations.

END OF SECTION

APPENDIX A

**AC 150/5370-2E
AIRPORT SAFETY ON AIRPORTS
DURING CONSTRUCTION**



U.S. Department
of Transportation
**Federal Aviation
Administration**

Advisory Circular

Subject: OPERATIONAL SAFETY ON AIRPORTS
DURING CONSTRUCTION

Date: 1/17/03

AC No: 150/5370-2E

Initiated by: AAS-300

Change:

1. THE PURPOSE OF THIS ADVISORY CIRCULAR (AC).

Aviation safety is the primary consideration at airports, especially during construction. This AC sets forth guidelines for operational safety on airports during construction. It contains major changes to the following areas: "Runway Safety Area," paragraph 3-2; "Taxiway Safety Areas/Object-Free Areas," paragraph 3-3; "Overview," paragraph 3-4; "Marking Guidelines for Temporary Threshold," paragraph 3-5; and "Hazard Marking and Lighting," paragraph 3-9.

2. WHAT THIS AC CANCELS.

This AC cancels AC 150/5370-2D, *Operational Safety on Airports During Construction*, dated May 31, 2002.

3. READING MATERIAL RELATED TO THIS AC.

Appendix 1 contains a list of reading materials on airport construction, design, and potential safety hazards during construction, as well as instructions for ordering these documents. Many of them, including this AC, are available on the Federal Aviation Administration (FAA) Web site.

4. WHO THIS AC AFFECTS.

This AC assists airport operators in complying with 14 Code of Federal Regulations (CFR), part 139, Certification and Operation: Land Airports Serving Certain Air Carriers, and with the requirements of airport construction projects receiving funds under the Airport Improvement Program or from the Passenger Facility Charge Program. While the FAA does not require noncertificated airports without grant agreements to adhere to these guidelines, we recommend that they do so as it will help these airports maintain a desirable level of operational safety during construction.

5. ADDITIONAL BACKGROUND INFORMATION.

Appendix 2 contains definitions of terms used in this AC. Appendix 3 provides airport operators with boilerplate format and language for developing a safety plan for an airport construction project. Appendix 4 is a sample Notice to Airmen form.

6. HAZARD LIGHTING IMPLEMENTATION TIME LINE.

Supplemental hazard lighting must be red in color by October 1, 2004. See paragraph 3-9 for more information.

DAVID L. BENNETT

Director, Office of Airport Safety and Standards

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CHAPTER 1. GENERAL SAFETY REQUIREMENTS AND RESPONSIBILITIES

1-1. OVERVIEW.

Hazardous practices and marginal conditions created by construction activities can decrease or jeopardize operational safety on airports. To minimize disruption of normal aircraft operations and to avoid situations that compromise the airport's operational safety, the airport operator must carefully plan, schedule, and coordinate construction activities. While the guidance in this AC is primarily used for construction operations, some of the methods and procedures described may also enhance day-to-day maintenance operations.

1-2. WHO IS RESPONSIBLE FOR SAFETY DURING CONSTRUCTION.

An airport operator has overall responsibility for construction activities on an airport. This includes the predesign, design, preconstruction, construction, and inspection phases. Additional information on these responsibilities can be found throughout this AC.

a. Airport operator's responsibilities—

(1) Develop internally or approve a construction safety plan developed by an outside consultant/contractor that complies with the safety guidelines in Chapter 2, "Safety Plans," and Appendix 3, "Airport Construction Safety Planning Guide," of this AC.

(2) Require contractors to submit plans indicating how they intend to comply with the safety requirements of the project.

(3) Convene a meeting with the construction contractor, consultant, airport employees, and, if appropriate, tenant sponsor to review and discuss project safety before beginning construction activity.

(4) Ensure contact information is accurate for each representative/point of contact identified in the safety plan.

(5) Hold weekly or, if necessary, daily safety meetings to coordinate activities.

(6) Notify users, especially aircraft rescue and fire fighting (ARFF) personnel, of construction activity and conditions that may adversely affect the operational safety of the airport via Notices to Airmen (NOTAMs) or other methods, as appropriate. Convene a meeting for review and discussion if necessary.

(7) Ensure that construction personnel know of any applicable airport procedures and of changes to those procedures that may affect their work.

(8) Ensure that construction contractors and subcontractors undergo training required by the safety plan.

(9) Develop and/or coordinate a construction vehicle plan with airport tenants, the airport traffic control tower (ATCT), and construction contractors. Include the vehicle plan in the safety plan. See Chapter 2, section 2, of this AC for additional information.

(10) Ensure tenants and contractors comply with standards and procedures for vehicle lighting, marking, access, operation, and communication.

(11) At certificated airports, ensure that each tenant's construction safety plan is consistent with 14 CFR part 139, Certification and Operations: Land Airports Serving Certain Air Carriers.

(12) Conduct frequent inspections to ensure construction contractors and tenants comply with the safety plan and that altered construction activities do not create potential safety hazards.

(13) Resolve safety deficiencies immediately.

(14) Ensure construction access complies with the security requirements of 49 CFR part 1542, Airport Security.

(15) Notify appropriate parties when conditions exist that invoke provisions of the safety plan (e.g., implementation of low-visibility operations).

b. Construction contractor's responsibilities—

(1) Submit plans to the airport operator on how to comply with the safety requirements of the project.

(2) Have available a copy of the project safety plan.

(3) Comply with the safety plan associated with the construction project and ensure that construction personnel are familiar with safety procedures and regulations on the airport.

(4) Provide a point of contact who will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport.

(5) Provide a safety officer/construction inspector familiar with airport safety to monitor construction activities.

(6) Restrict movement of construction vehicles to construction areas by flagging and barricading, erecting temporary fencing, or providing escorts, as appropriate.

(7) Ensure that no construction employees, employees of subcontractors or suppliers, or other persons enter any part of the air operations areas (AOAs) from the construction site unless authorized.

c. Tenant's responsibilities if planning construction activities on leased property—

(1) Develop a safety plan, and submit it to the airport operator for approval prior to issuance of a Notice to Proceed.

(2) Provide a point of contact who will coordinate an immediate response to correct any

construction-related activity that may adversely affect the operational safety of the airport.

(3) Ensure that no tenant or construction employees, employees of subcontractors or suppliers, or any other persons enter any part of the AOA from the construction site unless authorized.

(4) Restrict movement of construction vehicles to construction areas by flagging and barricading or erecting temporary fencing.

CHAPTER 2. SAFETY PLANS

Section 1. Basic Safety Plan Considerations

2-1. OVERVIEW.

Airport operators should coordinate safety issues with the air carriers, FAA Airway Facilities, and other airport tenants before the design phase of the project. The airport operator should identify project safety concerns, requirements, and impacts before making arrangements with contractors and other personnel to perform work on an airport. These safety concerns will serve as the foundation for the construction safety plan and help maintain a high level of aviation safety during the project.

The airport operator should determine the level of complexity of the safety plan that is necessary for each construction project and its phases. The safety plan may be detailed in the specifications included in the invitation for bids, or the invitation for bid may specify that the contractor develop the safety plan and the airport operator approve it. In the latter case, the invitation for bid should contain sufficient information to allow the contractor to develop and determine the costs associated with the safety plan. In either case, safety plan costs should be incorporated into the total cost of the project. The airport operator has final approval authority and responsibility for all safety plans.

Coordination will vary from formal predesign conferences to informal contacts throughout the duration of the construction project.

Details of a specified safety plan, or requirements for a contractor-developed safety plan, should be discussed at the predesign and preconstruction conferences and should include the following, as appropriate:

- a. Actions necessary before starting construction, including defining and assigning responsibilities.
- b. Basic responsibilities and procedures for disseminating instructions about airport procedures to the contractor's personnel.
- c. Means of separating construction areas from aeronautical-use areas.
- d. Navigational aid (NAVAID) requirements and weather.
- e. Marking and lighting plan illustrations.
- f. Methods of coordinating significant changes in airport operations with all the appropriate parties.

2-2. SAFETY PLAN CHECKLIST.

To the extent applicable, the safety plan should address the following:

- a. Scope of work to be performed, including proposed duration of work.
- b. Runway and taxiway marking and lighting.
- c. Procedures for protecting all runway and taxiway safety areas, obstacle-free zones (OFZs), object-free areas (OFAs), and threshold citing criteria outlined in AC 150/5300-13, *Airport Design*, and as described in this AC. This includes limitations on equipment height and stockpiled material.
- d. Areas and operations affected by the construction activity, including possible safety problems.
- e. NAVAIDs that could be affected, especially critical area boundaries.
- f. Methods of separating vehicle and pedestrian construction traffic from the airport movement areas. This may include fencing off construction areas to keep equipment operators in restricted areas in which they are authorized to operate. Fencing, or some other form of restrictive barrier, is an operational necessity in some cases.
- g. Procedures and equipment, such as barricades (identify type), to delineate closed construction areas from the airport operational areas, as necessary.
- h. Limitations on construction.
- i. Required compliance of contractor personnel with all airport safety and security measures.
- j. Location of stockpiled construction materials, construction site parking, and access and haul roads.
- k. Radio communications.
- l. Vehicle identification.
- m. Trenches and excavations and cover requirements.

- n. Procedures for notifying ARFF personnel if water lines or fire hydrants must be deactivated or if emergency access routes must be rerouted or blocked.
- o. Emergency notification procedures for medical and police response.
- p. Use of temporary visual aids.
- q. Wildlife management.
- r. Foreign object debris (FOD) control provisions.
- s. Hazardous materials (HAZMAT) management.
- t. NOTAM issuance.
- u. Inspection requirements.
- v. Procedures for locating and protecting existing underground utilities, cables, wires, pipelines, and other underground facilities in excavation areas.
- w. Procedures for contacting responsible representatives/points of contact for all involved parties. This should include off-duty contact information so an immediate response may be coordinated to correct any construction-related activity that could adversely affect the operational safety of the airport. Particular care should be taken to ensure that appropriate Airways Facilities personnel are identified in the event that an unanticipated utility outage or cable cut occurs that impacts FAA NAVAIDS.
- x. Vehicle operator training.
- y. Penalty provisions for noncompliance with airport rules and regulations and the safety plan (e.g., if a vehicle is involved in a runway incursion).
- z. Any special conditions that affect the operation of the airport and will require a portion of the safety plan to be activated (e.g., low-visibility operations, snow removal).

Section 2. Safety and Security Measures

2-3. OVERVIEW.

Airport operators are responsible for closely monitoring tenant and construction contractor activity during the construction project to ensure continual compliance with all safety and security requirements. Airports subject to 49 CFR part 1542, Airport Security, must meet standards for access control, movement of ground vehicles, and identification of construction contractor and tenant personnel. In addition, airport operators should use safety program standards, as described in Chapter 3 of this AC, to develop specific safety measures to which tenants and construction contractors must adhere throughout the duration of construction activities.

General safety provisions are contained in AC 150/5370-10, *Standards for Specifying Construction of Airports*, paragraphs 40-05, "Maintenance of Traffic"; 70-08, "Barricades, Warning Signs, and Hazard Markings"; and 80-04, "Limitation of Operations." At any time during construction, aircraft operations, weather, security, or local airport rules may dictate more stringent safety measures. The airport operator should ensure that both general and specific safety requirements are coordinated with airport tenants and ATCT personnel. The airport operator should also include these parties in the coordination of all bid documents, construction plans, and specifications for on-airport construction projects.

2-4. VEHICLE OPERATION AND MARKING AND PEDESTRIAN CONTROL.

Vehicle and pedestrian access routes for airport construction projects must be controlled to prevent inadvertent or unauthorized entry of persons, vehicles, or animals onto the AOA. This includes aircraft movement and nonmovement areas. The airport operator should develop and coordinate a construction vehicle plan with airport tenants, contractors, and the ATCT. The safety plan or invitation for bid should include specific vehicle and pedestrian requirements.

The vehicle plan should contain the following items:

- a. Airport operator's rules and regulations for vehicle marking, lighting, and operation.
- b. Requirements for marking and identifying vehicles in accordance with AC 150/5210-5, *Painting, Marking, and Lighting of Vehicles Used on an Airport*.
- c. Description of proper vehicle operations on movement and nonmovement areas under normal, lost communications, and emergency conditions.
- d. Penalties for noncompliance with driving rules and regulations.
- e. Training requirements for vehicle drivers to ensure compliance with the airport operator's vehicle rules and regulations.
- f. Provisions for radio communication training for construction contractor personnel engaged in construction activities around aircraft movement areas. Some drivers,

such as construction drivers under escort, may not require this training.

g. Escort procedures for construction vehicles requiring access to aircraft movement areas. A vehicle in the movement area must have a working aviation-band, two-way radio unless it is under escort. Vehicles can be in closed areas without a radio if the closed area is properly marked and lighted to prevent incursions and a NOTAM regarding the closure is issued.

h. Monitoring procedures to ensure that vehicle drivers are in compliance with the construction vehicle plan.

i. Procedures for, if appropriate, personnel to control access through gates and fencing or across aircraft movement areas.

2-5. CONSTRUCTION EMPLOYEE PARKING AREAS.

Designate in advance vehicle parking areas for contractor employees to prevent any unauthorized entry of persons or vehicles onto the airport movement area. These areas should provide reasonable contractor employee access to the job site.

2-6. CONSTRUCTION VEHICLE EQUIPMENT PARKING.

Construction employees must park and service all construction vehicles in an area designated by the airport operator outside the runway safety areas and OFZs and never on a closed taxiway or runway. Employees should also park construction vehicles outside the OFA when not in use by construction personnel (e.g., overnight, on weekends, or during other periods when construction is not active). Parking areas must not obstruct the clear line of sight by the ATCT to any taxiways or runways under air traffic control nor obstruct any runway visual aids, signs, or navigational aids. The FAA must also study those areas to determine effects on 14 CFR part 77, *Objects Affecting Navigable Airspace*, surfaces (see paragraph 2-13 for further information).

2-7. RADIO COMMUNICATION TRAINING.

The airport operator must ensure that tenant and construction contractor personnel engaged in activities involving unescorted operation on aircraft movement

areas observe the proper procedures for communications, including using appropriate radio frequencies at airports with and without ATCTs. Training of contractors on proper communication procedures is essential for maintaining airport operational safety. When operating vehicles on or near open runways or taxiways, construction personnel must understand the critical importance of maintaining radio contact with airport operations, ATCT, or the Common Traffic Advisory Frequency, which may include UNICOM, MULTICOM, or one of the FAA Flight Service Stations (FSS), as directed by airport management.

Vehicular traffic crossing active movement areas must be controlled either by two-way radio with the ATCT, escort, flagman, signal light, or other means appropriate for the particular airport. Vehicle drivers must confirm by personal observation that no aircraft is approaching their position when given clearance to cross a runway. In addition, it is the responsibility of the escort vehicle driver to verify the movement/position of all escorted vehicles at any given time.

Even though radio communication is maintained, escort vehicle drivers must also familiarize themselves with ATCT light gun signals in the event of radio failure (see the FAA safety placard "Ground Vehicle Guide to Airport Signs and Markings"). This safety placard may be ordered through the Runway Safety Program Web site at <http://www.faarsp.org> or obtained from the Regional Airports Division Office.

2-8. FENCING AND GATES.

Airport operators and contractors must take care to maintain a high level of safety and security during construction when access points are created in the security fencing to permit the passage of construction vehicles or personnel. Temporary gates should be equipped so they can be securely closed and locked to prevent access by animals and people (especially minors). Procedures should be in place to ensure that only authorized persons and vehicles have access to the AOA and to prohibit "piggybacking" behind another person or vehicle. The Department of Transportation (DOT) document DOT/FAA/AR-00/52, *Recommended Security Guidelines for Airport Planning and Construction*, provides more specific information on fencing. A copy of this document can be obtained from the Airport Consultants Council, Airports Council International, or American Association of Airport Executives.

Section 3. Notification of Construction Activities

2-9. GENERAL.

In order to maintain the desired levels of operational safety on airports during construction activities, the safety

plan should contain the notification actions described below.

2-10. ENSURING PROMPT NOTIFICATIONS.

The airport operator should establish and follow procedures for the immediate notification of airport users and the FAA of any conditions adversely affecting the operational safety of an airport.

2-11. NOTICES TO AIRMEN (NOTAMS).

The airport operator must provide information on closed or hazardous conditions on airport movement areas to the FSS so it can issue a NOTAM. The airport operator must coordinate the issuance, maintenance, and cancellation of NOTAMs about airport conditions resulting from construction activities with tenants and the local air traffic facility (control tower, approach control, or air traffic control center. Refer to AC 150/5200-28, *Notices to Airmen (NOTAMS) for Airport Operators*, and Appendix 4 in this AC for a sample NOTAM form. Only the FAA may issue or cancel NOTAMs on shutdown or irregular operation of FAA-owned facilities. Only the airport operator or an authorized representative may issue or cancel NOTAMs on airport conditions. (The airport owner/operator is the only entity that can close or open a runway.) The airport operator must file and maintain this list of authorized representatives with the FSS. Any person having reason to believe that a NOTAM is missing, incomplete, or inaccurate must notify the airport operator.

2-12. AIRCRAFT RESCUE AND FIRE FIGHTING (ARFF) NOTIFICATION.

The safety plan must provide procedures for notifying ARFF personnel, mutual aid providers, and other emergency services if construction requires shutting off or otherwise disrupting any water line or fire hydrant on the airport or adjoining areas and if contractors work with hazardous material on the airfield. Notification procedures must also be developed for notifying ARFF and all other emergency personnel when the work performed will close or affect any emergency routes. Likewise, the procedures must address appropriate notifications when services are restored.

2-13. NOTIFICATION TO THE FAA.

For certain airport projects, 14 CFR part 77 requires notification to the FAA. In addition to applications made for Federally funded construction, 14 CFR part 157, Notice of Construction, Alteration, Activation, and

Deactivation of Airports, requires that the airport operator notify the FAA in writing whenever a non-Federally funded project involves the construction of a new airport; the construction, realigning, altering, activating, or abandoning of a runway, landing strip, or associated taxiway; or the deactivation or abandoning of an entire airport. Notification involves submitting FAA Form 7480-1, Notice of Landing Area Proposal, to the nearest FAA Regional Airports Division Office or Airports District Office.

Also, any person proposing any kind of construction or alteration of objects that affect navigable airspace, as defined in 14 CFR part 77 must notify the FAA. This includes construction equipment and proposed parking areas for this equipment (i.e., cranes, graders, etc.). FAA Form 7460-1, Notice of Proposed Construction or Alteration, can be used for this purpose and submitted to the FAA Regional Airports Division Office or Airports District Office. (See AC 70/7460-2, *Proposed Construction or Alteration of Objects that May Affect the Navigable Airspace*.)

If construction operations require a shutdown of an airport owned NAVAID from service for more than 24 hours or in excess of 4 hours daily on consecutive days, we recommend a 45-day minimum notice prior to facility shutdown. Coordinate work for a FAA owned NAVAID shutdown with the local FAA Airways Facilities Office. In addition, procedures that address unanticipated utility outages and cable cuts that could impact FAA NAVAIDs must be addressed.

2-14. WORK SCHEDULING AND ACCOMPLISHMENT.

Airport operators—or tenants having construction on their leased properties—should use predesign, prebid, and preconstruction conferences to introduce the subject of airport operational safety during construction (see AC 150/5300-9, *Predesign, Prebid, and Preconstruction Conferences for Airport Grant Projects*). The airport operator, tenants, and construction contractors should integrate operational safety requirements into their planning and work schedules as early as practical. Operational safety should be a standing agenda item for discussion during progress meetings throughout the project. The contractor and airport operator should carry out onsite inspections throughout the project and immediately remedy any deficiencies, whether caused by negligence, oversight, or project scope change.

CHAPTER 3. SAFETY STANDARDS AND GUIDELINES

Section 1. Runway and Taxiway Safety Areas, Obstacle-Free Zones, and Object-Free Areas

3-1. OVERVIEW.

Airport operators must use these safety guidelines when preparing plans and specifications for construction activities in areas that may interfere with aircraft operations. The safety plan should recognize and address these standards for each airport construction project. However, the safety plan must reflect the specific needs of a particular project, and for this reason, these safety guidelines should not be incorporated verbatim into project specifications. For additional guidance on meeting safety and security requirements, refer to the planning guide template included in Appendix 3 of this AC.

3-2. RUNWAY SAFETY AREA (RSA)/ OBSTACLE-FREE ZONE (OFZ).

A runway safety area is the defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway (see AC 150/5300-13, *Airport Design*). Construction activities within the standard RSA are subject to the following conditions:

a. Runway edges.

(1) No construction may occur closer than 200 feet (60m) from the runway centerline unless the runway is closed or restricted to aircraft operations, requiring an RSA that is equal to the RSA width available during construction, or 400 feet, whichever is less (see AC 150/5300-13, Tables 3-1 through 3-3).

(2) Personnel, material, and/or equipment must not penetrate the OFZ, as defined in AC 150/5300-13.

(3) The airport operator must coordinate the construction activity in the RSA as permitted above with the ATCT and the FAA Regional Airports Division Office or appropriate Airports District Office and issue a local NOTAM.

b. Runway ends.

(1) An RSA must be maintained of such dimensions that it extends beyond the end of the runway a distance equal to that which existed before construction activity, unless the runway is closed or restricted to aircraft operations for which the reduced RSA is adequate (see AC 150/5300-13). The temporary use of declared distances and/or partial runway closures may help provide the necessary RSA.

In addition, all personnel, materials, and/or equipment must remain clear of the applicable threshold siting surfaces, as defined in Appendix 2, "Threshold Siting Requirements," of AC 150/5300-13.¹ Consult with the appropriate FAA Regional Airports Division Office or Airports District Office to determine the appropriate approach surface required.

(2) Personnel, material, and/or equipment must not penetrate the OFZ, as defined in AC 150/5300-13.

(3) The safety plan must provide procedures for ensuring adequate distance for blast protection, if required by operational considerations.

(4) The airport operator must coordinate construction activity in this portion of the RSA with the ATCT and the FAA Regional Airports Division Office or appropriate Airports District Office and issue a local NOTAM.

c. Excavations.

(1) Construction contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.

(2) Open trenches or excavations are not permitted within 200 feet (60m) of the runway centerline and at least the existing RSA distance from the runway threshold while the runway is open. If the runway must be opened before excavations are backfilled, cover the excavations appropriately. Coverings for open trenches or excavations must be of sufficient strength to support the weight of the heaviest aircraft operating on the runway.

3-3. TAXIWAY SAFETY AREAS/OBJECT-FREE AREAS.

a. Unrestricted construction activity is permissible adjacent to taxiways when the taxiway is restricted to aircraft such that the available taxiway safety area is equal

¹If a full safety area cannot be obtained through declared distances and partial closures, or other methods such as alternate runway use, construction activity may operate in the RSA as long as conditions cited in paragraph 3-1b(2) thru (4) are met. In addition, various surfaces outlined in AC 150/5300-13 and Terminal Instrument Procedures (TERPS) must be protected through an aeronautical study.

to at least ½ of the widest wingspan of the aircraft expected to use the taxiway and the available taxiway object-free area is equal to at least .7 times the widest wingspan plus 10 feet. (See AC 150/5300-13 for guidance on taxiway safety and object-free areas.)

Construction activity may be accomplished closer to a taxiway, subject to the following restrictions:

- (1) The activity is first coordinated with the airport operator.
- (2) Appropriate NOTAMs are issued.
- (3) Marking and lighting meeting the provisions of paragraph 3-9 are implemented.
- (4) Adequate clearance is maintained between equipment and materials and any part of an aircraft. If such clearance can only be maintained if an aircraft does not have full use of the entire taxiway width (with its

main landing gear at the edge of the pavement), then it will be necessary to move personnel and equipment for each passing aircraft. In these situations, flag persons will be used to direct construction equipment, and wing walkers may be necessary to guide aircraft. Wing walkers should be airline/aviation personnel rather than construction workers.

b. Construction contractors must prominently mark open trenches and excavations at the construction site, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness

c. Excavations and open trenches may be permitted up to the edge of a structural taxiway and apron pavement provided the dropoff is marked and lighted per paragraph 3-9, "Hazard Marking and Lighting."

Section 2. Temporary Runway Thresholds

3-4. OVERVIEW.

Construction activity in a runway approach area may result in the need to partially close a runway or displace the existing runway threshold. In either case, locate the threshold in accordance with Appendix 2 of AC 150/5300-13, *Airport Design*. Objects that do not penetrate these surfaces may still be obstructions to air navigation and may affect standard instrument approach procedures. Coordinate these objects with the FAA's Regional Airports Office or appropriate Airports District Office, as necessary. Refer to the current edition of AC 150/5300-13 for guidance on threshold siting requirements. The partial runway closure, the displacement of the runway threshold, as well as closures of the complete runway and other portions of the movement area also requires coordination with appropriate ATCT personnel and airport users.

Caution regarding partial runway closures: When filing a NOTAM for a partial runway closure, clearly state to FSS personnel that the portion of pavement located prior to the threshold is not available for landing and departing traffic. In this case, the threshold has been moved for both landing and takeoff purposes (this is different than a displaced threshold).

Example NOTAM: "North 1,000 feet of Runway 18/36 is closed; 7,000 feet remain available on Runway 18 and Runway 36 for arrivals and departures." There may be situations where the portion of closed runway is available for taxiing only. If so, the NOTAM must reflect this condition.

Caution regarding displaced thresholds: Implementation of a displaced threshold affects runway length available for aircraft landing over the displacement. Depending on the reason for the displacement (to provide obstruction clearance or RSA),

such a displacement may also require an adjustment in the landing distance available and accelerate-stop distance available in the opposite direction. If project scope includes personnel, equipment, excavation, etc. within the RSA of any usable runway end, we do not recommend a displaced threshold unless arrivals and departures toward the construction activity are prohibited. Instead, implement a partial closure.

3-5. MARKING GUIDELINES FOR TEMPORARY THRESHOLD.

Ensure that markings for temporary displaced thresholds are clearly visible to pilots approaching the airport to land. When construction personnel and equipment are located close to any threshold, a temporary visual NAVAID, such as runway end identifier lights (REIL), may be required (even on unlighted runways) to define the new beginning of the runway clearly. A visual vertical guidance device, such as a visual approach slope indicator (VASI), pulse light approach slope indicator (PLASI), or precision approach path indicator (PAPI), may be necessary to assure landing clearance over personnel, vehicles, equipment, and/or above-grade stockpiled materials. If such devices are installed, ensure an appropriate descriptive NOTAM is issued to inform pilots of these conditions. The current edition of AC 150/5340-1, *Standards for Airport Markings*, describes standard marking colors and layouts. In addition, we recommend that a temporary runway threshold be marked using the following guidelines:

a. Airport markings must be clearly visible to pilots; not misleading, confusing, or deceptive; secured in place to prevent movement by prop wash, jet blast, wing vortices, or other wind currents; and constructed of

materials that would minimize damage to an aircraft in the event of inadvertent contact.

(1) Pavement markings for temporary closed portions of the runway should consist of yellow chevrons to identify pavement areas that are unsuitable for takeoff/landing (see AC 150/5340-1). If unable to paint the markings on the pavement, construct them from any of the following materials: double-layered painted snow fence, colored plastic, painted sheets of plywood, or similar materials. They must be properly configured and secured to prevent movement by prop wash, jet blast, or other wind currents.

(2) It may be necessary to remove or cover runway markings, such as runway designation markings and aiming point markings, depending on the length of construction and type of activity at the airport.

(3) When threshold markings are needed to identify the temporary beginning of the runway that is available for landing, use a white threshold bar of the dimensions specified in AC 150/5340-1.

(4) If temporary outboard elevated or flush threshold bars are used, locate them outside of the runway pavement surface, one on each side of the runway. They should be at least 10 feet (3m) in width and extend outboard from each side of the runway so they are clearly visible to landing and departing aircraft. These threshold bars are white. If the white threshold bars are not discernable on grass or snow, apply a black background with appropriate material over the ground to ensure the markings are clearly visible.

(5) A temporary threshold may also be marked with the use of retroreflective, elevated markers. One side of such markers is green to denote the approach end of the runway; the side that is seen by pilots on rollout is red. See AC 150/5345-39, *FAA Specification L-853, Runway and Taxiway Retroreflective Markers*.

(6) At 14 CFR part 139 certificated airports, temporary elevated threshold markers must be mounted with a frangible fitting (see 14 CFR part 139.309). However, at noncertificated airports, the temporary elevated threshold markings may either be mounted with a frangible fitting or be flexible. See AC 150/5345-39.

b. The application rate of the paint to mark a short-term temporary runway threshold may deviate from the standard (see Item P-620, "Runway and Taxiway Painting," in AC 150/5370-10, *Standards for Specifying Construction of Airports*), but the dimensions must meet the existing standards, unless coordinated with the appropriate offices.

c. When a runway is partially closed, the distance remaining signs for aircraft landing in the opposite direction should be covered or removed during the construction.

3-6. LIGHTING GUIDELINES FOR TEMPORARY THRESHOLD.

A temporary runway threshold must be lighted if the runway is lighted and it is the intended threshold for night landings or instrument meteorological conditions. We recommend that temporary threshold lights and related visual NAVAIDs be installed outboard of the edges of the full-strength pavement with bases at grade level or as low as possible, but not to exceed 3 inches (7.6cm) above ground. When any portion of a base is above grade, place properly compacted fill around the base to minimize the rate of gradient change so aircraft can, in an emergency, cross at normal landing or takeoff speeds without incurring significant damage (see AC 150/5370-10). We recommend that the following be observed when using temporary runway threshold lighting:

a. Maintain threshold and edge lighting color and spacing standards as described in AC 150/5340-24, *Runway and Taxiway Edge Lighting System*. Battery-powered, solar, or portable lights that meet the criteria in AC 150/5345-50, *Specification for Portable Runway Lights*, may be used. These systems are intended primarily for visual flight rules (VFR) aircraft operation but may be used for instrument flight rules (IFR) aircraft operations, upon individual approval from the Flight Standards Division of the applicable FAA Regional Office.

b. When the runway has been partially closed, disconnect edge and threshold lights with associated isolation transformers on that part of the runway at and behind the threshold (i.e., the portion of the runway that is closed). Alternately, cover the light fixture in such a way as to prevent light leakage. Avoid removing the lamp from energized fixtures because an excessive number of isolation transformers with open secondaries may damage the regulators and/or increase the current above its normal value.

c. Secure, identify, and place any temporary exposed wiring in conduit to prevent electrocution and fire ignition sources.

d. Reconfigure yellow lenses (caution zone), as necessary. If the runway has centerline lights, reconfigure the red lenses, as necessary, or place the centerline lights out of service.

e. Relocate the visual glide slope indicator (VGSI), such as VASI and PAPI; other airport lights, such as REIL; and approach lights to identify the temporary threshold. Another option is to disable the VGSI or any equipment that would give misleading indications to pilots as to the new threshold location. Installation of temporary visual aids may be necessary to provide adequate guidance to pilots on approach to the affected runway. If the FAA owns and operates the VGSI,

coordinate its installation or disabling with the local Airway Facilities Systems Management Office.

f. Issue a NOTAM to inform pilots of temporary lighting conditions.

Section 3. Other Construction Marking and Lighting Activities

3-7. OVERVIEW.

Ensure that construction areas, including closed runways, are clearly and visibly separated from movement areas and that hazards, facilities, cables, and power lines are identified prominently for construction contractors. Throughout the duration of the construction project, verify that these areas remain clearly marked and visible at all times and that marking and lighting aids remain in place and operational. Routine inspections must be made of temporary construction lighting, especially battery-powered lighting since weather conditions can limit battery life.

3-8. CLOSED RUNWAY AND TAXIWAY MARKING AND LIGHTING.

Closed runway markings consist of a yellow "X" in compliance with the standards of AC 150/5340-1, *Standards for Airport Markings*. A very effective and preferable visual aid to depict temporary closure is the lighted "X" signal placed on or near the runway designation numbers. This device is much more discernible to approaching aircraft than the other materials described. If the lighted "X" is not available, construct the marking of any of the following materials: double-layered painted snow fence, colored plastic, painted sheets of plywood, or similar materials. They must be properly configured and secured to prevent movement by prop wash, jet blast, or other wind currents. In addition, the airport operator may install barricades, traffic cones, activate stop bars, or other acceptable visual devices at major entrances to the runways to prevent aircraft from entering a closed portion of runway. The placement of even a single reflective barricade with a "do not enter" sign on a taxiway centerline can prevent an aircraft from continuing onto a closed runway. If the taxiway must remain open for aircraft crossings, barricades or markings, as described above or in paragraph 3-9, should be placed on the runway.

a. Permanently closed runways.

For runways and taxiways that have been permanently closed, disconnect the lighting circuits. For runways, obliterate the threshold marking, runway designation marking, and touchdown zone markings, and place "X's" at each end and at 1,000-foot (300-m) intervals. For taxiways, place an "X" at the entrance of the closed taxiway.

b. Temporarily closed runway and taxiways.

For runways that have been temporarily closed, place an "X" at the each end of the runway. With taxiways, place an "X" at the entrance of the closed taxiway.

c. Temporarily closed airport.

When the airport is closed temporarily, mark the runways as closed and turn off the airport beacon.

d. Permanently closed airports

When the airport is closed permanently, mark the runways as permanently closed, disconnect the airport beacon, and place an "X" in the segmented circle or at a central location if no segmented circle exists.

3-9. HAZARD MARKING AND LIGHTING.

Provide prominent, comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles. Using appropriate hazard marking and lighting may prevent damage, injury, traffic delays, and/or facility closures. Hazard marking and lighting must restrict access and make specific hazards obvious to pilots, vehicle drivers, and other personnel. Barricades, traffic cones (weighted or sturdily attached to the surface), or flashers are acceptable methods used to identify and define the limits of construction and hazardous areas on airports.

Provide temporary hazard marking and lighting to prevent aircraft from taxiing onto a closed runway for takeoff and to identify open manholes, small areas under repair, stockpiled material, and waste areas. Also consider less obvious construction-related hazards and include markings to identify FAA, airport, and National Weather Service facilities cables and power lines; instrument landing system (ILS) critical areas; airport surfaces, such as RSA, OFA, and OFZ; and other sensitive areas to make it easier for contractor personnel to avoid these areas.

The construction specifications must include a provision requiring the contractor to have a person on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades. The contractor must file the contact person's information with the airport.

a. Nonmovement areas.

Indicate construction locations on nonmovement areas in which no part of an aircraft may enter by using barricades that are marked with diagonal, alternating orange and white stripes. Barricades may be supplemented with alternating

orange and white flags at least 20 by 20 inches (50 by 50 cm) square and made and installed so they are always in an extended position, properly oriented, and securely fastened to eliminate jet engine ingestion. Such barricades may be many different shapes and made from various materials, including railroad ties, sawhorses, jersey barriers, or barrels. During reduced visibility or night hours, supplement the barricades with red lights, either flashing or steady-burning, which should meet the luminance requirements of the State Highway Department (yellow lights are not acceptable after October 1, 2004). The intensity of the lights and spacing for barricade flags and lights must adequately and without ambiguity delineate the hazardous area.

b. Movement areas.

Use orange traffic cones; red lights, either flashing or steady-burning, which should meet the luminance requirements of the State Highway Department (yellow lights are not acceptable after October 1, 2004); collapsible barricades marked with diagonal, alternating orange and white stripes; and/or signs to separate all construction/maintenance areas from the movement area. All barricades, temporary markers, and other objects placed and left in safety areas associated with any open runway, taxiway, or taxilane must be as low as possible to the ground; of low mass; easily collapsible upon contact with an aircraft or any of its components; and weighted or sturdily attached to the surface to prevent displacement from prop wash, jet blast, wing vortex, or other surface wind currents. If affixed to the surface, they must be frangible at grade level or as low as possible, but not to exceed 3 inches (7.6cm) above the ground. Do not use nonfrangible hazard markings, such as concrete barriers and/or metal-drum-type barricades, in aircraft movement areas. Do not use railroad ties on runways.

Use highly reflective barriers with flashing or steady-burning red lights to barricade taxiways leading to closed runways. Evaluate all operating factors when determining how to mark temporary closures that can last from 10 to 15 minutes to a much longer period of time. However, we strongly recommend that, even for closures of relatively short duration, major taxiway/runway intersections be identified with barricades spaced no greater than 20 feet (6m) apart. Mark the barricades with a flashing or steady-burning red light. At a minimum, use a single barricade placed on the taxiway centerline.

3-10. CONSTRUCTION NEAR NAVIGATIONAL AIDS (NAVAIDS).

Construction activities, materials/equipment storage, and vehicle parking near electronic NAVAIDS require special consideration since they may interfere with signals essential to air navigation. Evaluate the effect of construction activity and the required distance and direction from the NAVAID for each construction project. Pay particular attention to stockpiling material, as well as

to movement and parking of equipment that may interfere with line of sight from the ATCT or with electronic emissions. Interference from construction may require NAVAID shutdown or adjustment of instrument approach minimums for IFR. This condition requires that a NOTAM be filed. Construction activities and materials/equipment storage near a NAVAID may also obstruct access to the equipment and instruments for maintenance. Before commencing construction activity, parking vehicles, or storing construction equipment and materials near a NAVAID, consult with the nearest FAA Airway Facilities Office.

3-11. CONSTRUCTION SITE ACCESS AND HAUL ROADS.

Determine the construction contractor's access to the construction sites and haul roads. Do not permit the construction contractor to use any access or haul roads other than those approved. Construction contractors must submit specific proposed routes associated with construction activities to the airport operator for evaluation and approval as part of the safety plan before beginning construction activities. These proposed routes must also provide specifications to prevent inadvertent entry to movement areas. Pay special attention to ensure that ARFF right of way on access and haul roads is not impeded at any time and that construction traffic on haul roads does not interfere with NAVAIDS or approach surfaces of operational runways.

3-12. CONSTRUCTION MATERIAL STOCKPILING.

Stockpiled materials and equipment storage are not permitted within the RSA and OFZ of an operational runway. The airport operator must ensure that stockpiled materials and equipment adjacent to these areas are prominently marked and lighted during hours of restricted visibility or darkness. This includes determining and verifying that materials are stored at an approved location to prevent foreign object damage and attraction of wildlife.

3-13. OTHER LIMITATIONS ON CONSTRUCTION.

Contractors may not use open-flame welding or torches unless adequate fire safety precautions are provided and the airport operator has approved their use. Under no circumstances should flare pots be used within the AOA at any time. The use of electrical blasting caps must not be permitted on or within 1,000 feet (300m) of the airport property (see AC 150/5370-10, *Standards for Specifying Construction of Airports*).

3-14. FOREIGN OBJECT DEBRIS (FOD) MANAGEMENT.

Waste and loose materials, commonly referred to as FOD, are capable of causing damage to aircraft landing gears, propellers, and jet engines. Construction contractors must

not leave or place FOD on or near active aircraft movement areas. Materials tracked onto these areas must be continuously removed during the construction project. We also recommend that airport operators and construction contractors carefully control and continuously remove waste or loose materials that might attract wildlife.

Section 4. Safety Hazards and Impacts

3-15. OVERVIEW.

The situations identified below are potentially hazardous conditions that may occur during airport construction projects. Safety area encroachments, unauthorized and improper ground vehicle operations, and unmarked or uncovered holes and trenches near aircraft operating surfaces pose the most prevalent threats to airport operational safety during airport construction projects. Airport operators and contractors should consider the following when performing inspections of construction activity:

- a. Excavation adjacent to runways, taxiways, and aprons.
- b. Mounds of earth, construction materials, temporary structures, and other obstacles near any open runway, taxiway, or taxilane; in the related object-free area and aircraft approach or departure areas/zones; or obstructing any sign or marking.
- c. Runway resurfacing projects resulting in lips exceeding 3 inches (7.6cm) from pavement edges and ends.
- d. Heavy equipment (stationary or mobile) operating or idle near AOA's, in runway approaches and departures areas, or in OFZ's.
- e. Equipment or material near NAVAIDs that may degrade or impair radiated signals and/or the monitoring of navigational and visual aids. Unauthorized or improper vehicle operations in localizer or glide slope critical areas, resulting in electronic interference and/or facility shutdown.
- f. Tall and especially relatively low-visibility units (i.e., equipment with slim profiles)—cranes, drills, and similar objects—located in critical areas, such as OFZ's and approach zones.
- g. Improperly positioned or malfunctioning lights or unlighted airport hazards, such as holes or excavations, on any apron, open taxiway, or open taxilane or in a related safety, approach, or departure area.
- h. Obstacles, loose pavement, trash, and other debris on or near AOA's. Construction debris (gravel,

sand, mud, paving materials, etc.) on airport pavements may result in aircraft propeller, turbine engine, or tire damage. Also, loose materials may blow about, potentially causing personal injury or equipment damage.

- i. Inappropriate or poorly maintained fencing during construction intended to deter human and animal intrusions into the AOA. Fencing and other markings that are inadequate to separate construction areas from open AOA's create aviation hazards.
- j. Improper or inadequate marking or lighting of runways (especially thresholds that have been displaced or runways that have been closed) and taxiways that could cause pilot confusion and provide a potential for a runway incursion. Inadequate or improper methods of marking, barricading, and lighting of temporarily closed portions of AOA's create aviation hazards.
- k. Wildlife attractants—such as trash (food scraps not collected from construction personnel activity), grass seeds, or ponded water—on or near airports.
- l. Obliterated or faded markings on active operational areas.
- m. Misleading or malfunctioning obstruction lights. Unlighted or unmarked obstructions in the approach to any open runway pose aviation hazards.
- n. Failure to issue, update, or cancel NOTAMs about airport or runway closures or other construction-related airport conditions.
- o. Failure to mark and identify utilities or power cables. Damage to utilities and power cables during construction activity can result in the loss of runway/taxiway lighting; loss of navigational, visual, or approach aids; disruption of weather reporting services; and/or loss of communications.
- p. Restrictions on ARFF access from fire stations to the runway-taxiway system or airport buildings.
- q. Lack of radio communications with construction vehicles in airport movement areas.
- r. Objects, regardless of whether they are marked or flagged, or activities anywhere on or near an airport

that could be distracting, confusing, or alarming to pilots during aircraft operations.

s. Water, snow, dirt, debris, or other contaminants that temporarily obscure or derogate the visibility of runway/taxiway marking, lighting, and pavement edges. Any condition or factor that obscures or diminishes the visibility of areas under construction.

t. Spillage from vehicles (gasoline, diesel fuel, oil, etc.) on active pavement areas, such as runways, taxiways, ramps, and airport roadways.

u. Failure to maintain drainage system integrity during construction (e.g., no temporary drainage provided when working on a drainage system).

v. Failure to provide for proper electrical lockout and tagging procedures. At larger airports with multiple maintenance shifts/workers, construction contractors should make provisions for coordinating work on circuits.

w. Failure to control dust. Consider limiting the amount of area from which the contractor is allowed to strip turf.

x. Exposed wiring that creates an electrocution or fire ignition hazard. Identify and secure wiring, and place it in conduit or bury it.

y. Site burning, which can cause possible obscuration.

z. Construction work taking place outside of designated work areas and out of phase.

APPENDIX 1. RELATED READING MATERIAL

1. Obtain the latest version of the following free publications from the FAA on its Web site at <http://www.faa.gov/arp/>. In addition, these ACs are available by contacting the U.S. Department of Transportation, Subsequent Distribution Office, SVC-121.23, Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20785.

a. AC 150/5200-28, *Notices to Airmen (NOTAM) for Airport Operators*. Provides guidance for the use of the NOTAM System in airport reporting.

b. AC 150/5200-30, *Airport Winter Safety and Operations*. Provides guidance to airport owners/operators on the development of an acceptable airport snow and ice control program and on appropriate field condition reporting procedures.

c. AC 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports*. Provides guidance on locating certain land uses having the potential to attract hazardous wildlife to public-use airports.

d. AC 150/5210-5, *Painting, Marking, and Lighting of Vehicles Used on an Airport*. Provides guidance, specifications, and standards for painting, marking, and lighting vehicles operating in the airport air operations areas.

e. AC 150/5220-4, *Water Supply Systems for Aircraft Fire and Rescue Protection*. Provides guidance for the selection of a water source and standards for the design of a distribution system to support aircraft rescue and fire fighting service operations on airports.

f. AC 150/5340-1, *Standards for Airport Markings*. Contains FAA standards for markings used on airport runways, taxiways, and aprons.

g. AC 150/5340-14B, *Economy Approach Lighting Aids*. Describes standards for the design, selection, siting, and maintenance of economy approach lighting aids.

h. AC 150/5340-18, *Standards for Airport Sign Systems*. Contains FAA standards for the siting and installation of signs on airport runways and taxiways.

i. AC 150/5345-28, *Precision Approach Path Indicator (PAPI) Systems*. Contains the FAA standards for PAPI systems, which provide pilots with visual glide slope guidance during approach for landing.

j. AC 150/5380-5, *Debris Hazards at Civil Airports*. Discusses problems at airports, gives information on foreign objects, and explains how to eliminate such objects from operational areas.

k. AC 70/7460-2, *Proposed Construction or Alteration of Objects that May Affect the Navigable Airspace*. Provides information to persons proposing to erect or alter an object that may affect navigable airspace and explains the need to notify the FAA before construction begins and the FAA's response to those notices, as required by 14 CFR part 77.

2. Obtain copies of the following publications from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Send a check or money order made payable to the Superintendent of Documents in the amount stated with your request. The Government Printing Office does not accept C.O.D. orders. In addition, the FAA makes these ACs available at no charge on the Web site at <http://www.faa.gov/arp/>.

a. AC 150/5300-13, *Airport Design*. Contains FAA standards and recommendations for airport design, establishes approach visibility minimums as an airport design parameter, and contains the object-free area and the obstacle free-zone criteria. (\$26. Supt. Docs.) SN050-007-01208-0.

b. AC 150/5370-10, *Standards for Specifying Construction of Airports*. Provides standards for construction of airports. Items covered include earthwork, drainage, paving, turfing, lighting, and incidental construction. (\$18. Supt. Docs.) SN050-007-0821-0.

APPENDIX 2. DEFINITIONS OF TERMS USED IN THE AC

1. **AIR OPERATIONS AREA (AOA).** Any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operations area includes such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runways, taxiways, or aprons.
2. **CONSTRUCTION.** The presence and movement of construction-related personnel, equipment, and materials in any location that could infringe upon the movement of aircraft.
3. **CERTIFICATED AIRPORT.** An airport that has been issued an Airport Operating Certificate by the FAA under the authority of 14 CFR part 139, Certification and Operation: Land Airports Serving Certain Air Carriers, or its subsequent revisions.
4. **FAA FORM 7460-1, NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION.** The form submitted to the FAA Regional Air Traffic or Airports Division Office as formal written notification of any kind of construction or alteration of objects that affect navigable airspace, as defined in 14 CFR part 77, Objects Affecting Navigable Airspace (see AC 70/7460-2, *Proposed Construction or Alteration of Objects that May Affect the Navigable Airspace*, found at <http://www.faa.gov/arp/>).
5. **FAA FORM 7480-1, NOTICE OF LANDING AREA PROPOSAL.** Form submitted to the FAA Airports Regional Division Office or Airports District Office as formal written notification whenever a project without an airport layout plan on file with the FAA involves the construction of a new airport; the construction, realigning, altering, activating, or abandoning of a runway, landing strip, or associated taxiway; or the deactivation or abandoning of an entire airport (found at <http://www.faa.gov/arp/>).
6. **MOVEMENT AREA.** The runways, taxiways, and other areas of an airport that are used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and aircraft parking areas (reference 14 CFR part 139).
7. **OBSTRUCTION.** Any object/obstacle exceeding the obstruction standards specified by 14 CFR part 77, subpart C.
8. **OBJECT-FREE AREA (OFA).** An area on the ground centered on the runway, taxiway, or taxilane centerline provided to enhance safety of aircraft operations by having the area free of objects except for those objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes (see AC 150/5300-13, *Airport Design*, for additional guidance on OFA standards and wingtip clearance criteria).
9. **OBSTACLE-FREE ZONE (OFZ).** The airspace below 150 feet (45m) above the established airport elevation and along the runway and extended runway centerline that is required to be clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance protection for aircraft landing or taking off from the runway and for missed approaches (refer to AC 150/5300-13 for guidance on OFZs).
10. **RUNWAY SAFETY AREA (RSA).** A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway, in accordance with AC 150/5300-13.
11. **TAXIWAY SAFETY AREA.** A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway, in accordance with AC 150/5300-13.
12. **THRESHOLD.** The beginning of that portion of the runway available for landing. In some instances, the landing threshold may be displaced.
13. **DISPLACED THRESHOLD.** The portion of pavement behind a displaced threshold that may be available for takeoffs in either direction or landing from the opposite direction.
14. **VISUAL GLIDE SLOPE INDICATOR (VGSI).** This device provides a visual glide slope indicator to landing pilots. These systems include precision approach path indicators (PAPIs), visual approach slope indicators (VASIs), and pulse light approach slope indicators (PLASIs).

APPENDIX 3. AIRPORT CONSTRUCTION SAFETY PLANNING GUIDE

Aviation Safety Requirements During Construction

PURPOSE. *This appendix provides airport operators with boilerplate format and language for developing a safety plan for an airport construction project. Adapt this appendix, as applicable, to specific conditions found on the airport for which the plan is being developed. Consider including a copy of this safety plan in the construction drawings for easy access by contractor personnel. Plans should contain the following:*

1. GENERAL SAFETY REQUIREMENTS.

Throughout the construction project, the following safety and operational practices should be observed:

- Operational safety should be a standing agenda item during progress meetings throughout the construction project.
- The contractor and airport operator must perform onsite inspections throughout the project, with immediate remedy of any deficiencies, whether caused by negligence, oversight, or project scope change.
- Airport runways and taxiways should remain in use by aircraft to the maximum extent possible.
- Aircraft use of areas near the contractor's work should be controlled to minimize disturbance to the contractor's operation.
- Contractor, subcontractor, and supplier employees or any unauthorized persons must be restricted from entering an airport area that would be hazardous.
- Construction that is within the safety area of an active runway, taxiway, or apron that is performed under normal operational conditions must be performed when the runway, taxiway, or apron is closed or use-restricted and initiated only with prior permission from the airport operator.
- The contracting officer, airport operator, or other designated airport representative may order the contractor to suspend operations; move personnel, equipment, and materials to a safe location; and stand by until aircraft use is completed.

2. CONSTRUCTION MAINTENANCE AND FACILITIES MAINTENANCE.

Before beginning any construction activity, the contractor must, through the airport operator, give notice [using the

Notice to Airmen (NOTAM) System] of proposed location, time, and date of commencement of construction. Upon completion of work and return of all such areas to standard conditions, the contractor must, through the airport operator, verify the cancellation of all notices issued via the NOTAM System. Throughout the duration of the construction project, the contractor must—

a. Be aware of and understand the safety problems and hazards described in AC 150/5370-2, *Operational Safety on Airports During Construction*.

b. Conduct activities so as not to violate any safety standards contained in AC 150/5370-2 or any of the references therein.

c. Inspect all construction and storage areas as often as necessary to be aware of conditions.

d. Promptly take all actions necessary to prevent or remedy any unsafe or potentially unsafe conditions as soon as they are discovered.

3. APPROACH CLEARANCE TO RUNWAYS.

Runway thresholds must provide an unobstructed approach surface over equipment and materials. (Refer to Appendix 2 in AC 150/5300-13, *Airport Design*, for guidance in this area.)

4. RUNWAY AND TAXIWAY SAFETY AREA (RSA AND TSA).

Limit construction to outside of the approved RSA, as shown on the approved airport layout plan—unless the runway is closed or restricted to aircraft operations, requiring a lesser standard RSA that is equal to the RSA available during construction (see AC 150/5370-2 for exceptions). Construction activity within the TSA is permissible when the taxiway is open to aircraft traffic if adequate wingtip clearance exists between the aircraft and equipment/material; evacuations, trenches, or other conditions are conspicuously marked and lighted; and local NOTAMs are in effect for the activity (see AC 150/5300-13 for wingtip clearance requirements). The NOTAM should state that, "personnel and equipment are working adjacent to Taxiway ____."

a. Procedures for protecting runway edges.

- Limit construction to no closer than 200 feet (60m) from the runway centerline—unless the runway is closed or restricted to aircraft operations, requiring a lesser standard RSA

- that is equal to the RSA available during construction.
- Prevent personnel, material, and/or equipment, as defined in AC 150/5300-13, Paragraph 306, "Obstacle Free Zone (OFZ)," from penetrating the OFZ.

- Coordinate construction activity with the Airport Traffic Control Tower (ATCT) and FAA Regional Airports Division Office or Airports District Office, and through the airport operator, issue an appropriate NOTAM.

Complete the following chart to determine the area that must be protected along the runway edges:

Runway	Aircraft Approach Category*	Airplane Design Group*	RSA Width in Feet Divided by 2*
	A, B, C, or D	I, II, III, or IV	
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

*See AC 150/5300-13, *Airport Design*, to complete the chart for a specific runway.

b. Procedures for protecting runway ends.

- Maintain the RSA from the runway threshold to a point at least the distance from the runway threshold as existed before construction activity—unless the runway is closed or restricted to aircraft operations, requiring an RSA that is equal to the RSA length available during construction in accordance with AC 150/5300-13. This may involve the use of declared distances and partial runway closures (see AC 150/5370-2 for exceptions).
- Ensure all personnel, materials, and/or equipment are clear of the applicable threshold siting criteria surface, as defined in Appendix 2, "Threshold Siting Requirements," of AC 150/5300-13.
- Prevent personnel, material, and/or equipment, as defined in AC 150/5300-13, from penetrating the obstacle-free zone.
- Ensure adequate distance for blast protection is provided, as needed.
- Coordinate construction activity with the ATCT and FAA Regional Airports Division Office or Airports District Office, and through the airport operator, issue an appropriate NOTAM.
- Provide a drawing showing the profile of the appropriate surfaces of each runway end where construction will take place. Where operations by turbojet aircraft are anticipated, review takeoff procedures and jet blast characteristics of aircraft and incorporate safety measures for construction workers in the contract documents.

Complete the following chart to determine the area that must be protected before the runway threshold:

Runway End Number	Airplane Design Group* I, II, III, or IV	Aircraft Approach Category* A, B, C, or D	Minimum Safety Area Prior to the Threshold*	Minimum Unobstructed Approach Slope
_____	_____	_____	_____ : FEET	_____ : 1 to (threshold)
_____	_____	_____	_____ : FEET	_____ : 1 to (threshold)
_____	_____	_____	_____ : FEET	_____ : 1 to (threshold)
_____	_____	_____	_____ : FEET	_____ : 1 to (threshold)

*See AC 150/5300-13, *Airport Design*, to complete the chart for a specific runway.

5. MARKING AND LIGHTING FOR TEMPORARY THRESHOLDS.

Marking and lighting for a temporary threshold is ___/is not ___ required. The airport owner or contractor, as specified in the contract, will furnish and maintain markings for temporary thresholds. Precision approach path indicators (PAPIs) or runway end identification lights (REIL) are ___/are not ___ required. The airport owner or contractor, as specified in the contract, will furnish and install all temporary lighting. Include appropriate items per AC 150/5370-2, Chapter 3, "Safety Standards and Guidelines." *If marking and lighting for the temporary threshold is not required, delete this section of the safety plan. If visual aids and/or markings are necessary, provide details. (Include applicable 14 CFR part 77 surfaces in the contract documents.)*

6. CLOSED RUNWAY MARKINGS AND LIGHTING.

The following must be specified for closed runways. Closed runway marking are ___/are not ___ required. Closed runway markings will be as shown on the plans ___/as furnished by the airport owner ___/other ___ (specify). Barricades, flagging, and flashers are ___/are not ___ required at Taxiway ___ and Runway ___ and will be supplied by the airport ___/other ___ (specify).

7. HAZARDOUS AREA MARKING AND LIGHTING.

Hazardous areas on the movement area will be marked with barricades, traffic cones, flags, or flashers (specify). These markings restrict access and make hazards obvious to aircraft, personnel, and vehicles. During periods of low visibility and at night, identify hazardous areas with red flashing or steady-burning lights (specify). The hazardous area marking and lighting will be supplied by

the airport operator/contractor, as specified in the contract, and will be depicted on the plans.

8. TEMPORARY LIGHTING AND MARKING.

Airport markings, lighting, and/or signs will be altered in the following manner (specify) during the period from ___ to ___. The alterations are depicted on the plans.

9. VEHICLE OPERATION MARKING AND CONTROL.

Include the following provisions in the construction contract, and address them in the safety plans:

a. When any vehicle, other than one that has prior approval from the airport operator, must travel over any portion of an aircraft movement area, it will be escorted and properly identified. To operate in those areas during daylight hours, the vehicle must have a flag or beacon attached to it. Any vehicle operating on the movement areas during hours of darkness or reduced visibility must be equipped with a flashing dome-type light, the color of which is in accordance with local or state codes.

b. It may be desirable to clearly identify the vehicles for control purposes by either assigned initials or numbers that are prominently displayed on each side of the vehicle. The identification symbols should be at minimum 8-inch (20-cm) block-type characters of a contrasting color and easy to read. They may be applied either by using tape or a water-soluble paint to facilitate removal. Magnetic signs are also acceptable. In addition, vehicles must display identification media, as specified in the approved security plan. *(This section should be revised to conform to the airport operator's requirements.)*

c. Employee parking shall be _____ (specify location), as designated by the airport manager _____ / project engineer _____ / other _____ (specify).

d. Access to the job site shall be via _____ (specify route), as shown on the plans _____ / designated by the engineer _____ / designated by the superintendent _____ / designated by the airport manager _____ / other _____ (specify).

e. At 14 CFR part 139 certificated and towered airports, all vehicle operators having access to the movement area must be familiar with airport procedures for the operation of ground vehicles and the consequences of noncompliance.

f. If the airport is certificated and/or has a security plan, the airport operator should check for guidance on the additional identification and control of construction equipment.

10. NAVIGATIONAL AIDS.

The contractor must not conduct any construction activity within navigational aid restricted areas without prior approval from the local FAA Airway Facilities sector representative. Navigational aids include instrument landing system components and very high-frequency omnidirectional range, airport surveillance radar. Such restricted areas are depicted on construction plans.

11. LIMITATIONS ON CONSTRUCTION.

Additional limitations on construction include—

a. Prohibiting open-flame welding or torch cutting operations unless adequate fire safety precautions are provided and these operations have been authorized by the airport operator (as tailored to conform to local requirements and restrictions).

b. Prominently marking open trenches, excavations, and stockpiled materials at the construction and lighting these obstacles during hours of restricted visibility and darkness.

c. Marking and lighting closed, deceptive, and hazardous areas on airports, as appropriate.

d. Constraining stockpiled material to prevent its movement as a result of the maximum anticipated aircraft blast and forecast wind conditions.

12. RADIO COMMUNICATIONS.

Vehicular traffic located in or crossing an active movement area must have a working two-way radio in contact with the control tower or be escorted by a person in radio contact with the tower. The driver, through personal observation, should confirm that no aircraft is approaching the vehicle position. Construction personnel may operate in a movement area without two-way radio communication provided a NOTAM is issued closing the area and the area is properly marked to prevent incursions. Two-way radio communications are _____ / are not _____ required between contractors and the Airport Traffic Control Tower _____ / FAA Flight Service Station _____ / Airport Aeronautical Advisory Stations (UNICOM/CTAF) _____. Radio contact is _____ / is not _____ required between the hours of _____ and _____. Continuous monitoring is required _____ / or is required only when equipment movement is necessary in certain areas _____. (This section may be tailored to suit the specific vehicle and safety requirements of the airport sponsor.)

13. DEBRIS.

Waste and loose material must not be placed in active movement areas. Materials tracked onto these areas must be removed continuously during the work project.

APPENDIX 4. SAMPLE NOTAM

_____ AIRPORT

FAA NOTAM # _____

DATE: _____

AIRPORT I.D. # _____

TIME: _____

NOTAM TEXT:

NOTIFICATON:

#### TOWER _____	_____	_____	_____	_____
	PHONE #	INITIALS	TIME	CALLED IN BY

#### FSS _____	_____	_____	_____	_____
	PHONE #	INITIALS	TIME	CALLED IN BY

AIRLINES

CANCELLED:

NOTIFICATON:

#### TOWER _____	_____	_____	_____	_____
	PHONE #	INITIALS	TIME	CALLED IN BY

#### FSS _____	_____	_____	_____	_____
	PHONE #	INITIALS	TIME	CALLED IN BY

AIRLINES

DIVISION V

Technical Specifications

DIVISION V
SECTION 1
MOBILIZATION

1-1.1 GENERAL. Mobilization shall consist of preparatory work and operations, including, but not limited to, attending preconstruction meetings; preparing project schedules; submittal documents; those actions necessary for the movement of personnel, equipment, supplies, traffic control devices, runway CLOSED markers, barricades and incidentals to the project site; establishing of all other facilities necessary for work on the Project; and for all other work and operations which must be performed or costs incurred prior to beginning work on the various CONTRACT items on the Project site.

1-1.2 SUBMITTALS. All materials and equipment used to construct this item shall be submitted to the ENGINEER for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are of good a quality and legible. Any deviations or substitutions from SPECIFICATIONS shall be identified, in writing, at the time the submittals are made.

Clearly and boldly mark each copy to identify pertinent products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be boldly and clearly made with arrows or circles (highlighting only is not acceptable). CONTRACTOR is solely responsible for delays in project accruing directly or indirectly from late submissions or resubmissions of submittals.

The data submitted shall be sufficient, in the opinion of the ENGINEER, to determine compliance with the plans and specifications. The CONTRACTOR's submittals shall be neatly bound in a properly sized 3-ring binder, tabbed by specification section. The ENGINEER reserves the right to reject any and all equipment, materials or procedures, which, in the ENGINEER's opinion, does not meet the system design and the standards and codes, specified.

1-1.3 AIRFIELD SAFETY AND TRAFFIC CONTROL. Airfield Safety and Traffic Control shall include the special requirements with respect to safely conducting construction activities, coordinating construction with aircraft operations, and maintaining the construction site in a manner that is compatible with aircraft. All items required in Safety Requirements and Special Provisions for Airport Construction, Division IV, shall be included in Airfield Safety and Traffic Control.

MEASUREMENT AND PAYMENT

1-2.1 MEASUREMENT. Mobilization and Airfield Safety and Traffic Control will be measured separately as lump sum items.

1-2.2 PAYMENT FOR MOBILIZATION.

- A. When the monthly partial payment estimate of the amount earned, not including the amount earned for Mobilization, is 5 percent or more of the original CONTRACT amount, 50 percent of the CONTRACT item price for Mobilization will be included in the estimate for payment.
- B. When the monthly partial payment estimate of the amount earned, not including the amount earned for Mobilization, is 10 percent or more of the original CONTRACT amount, the total amount earned for Mobilization shall be 75 percent of the CONTRACT item price for Mobilization and said amount will be included in the estimate for payment.
- C. When the monthly partial payment estimate of the amount earned, not including the amount earned for Mobilization, is 20 percent or more of the original CONTRACT amount, the total amount earned for Mobilization shall be 95 percent of the CONTRACT item price for Mobilization and said amount will be included in the estimate for payment.
- D. When the monthly partial payment estimate of the amount earned, not including the amount earned for Mobilization, is 50 percent or more of the original CONTRACT amount, the total amount earned for Mobilization shall be 100 percent of the CONTRACT item price for Mobilization and said amount will be included in the estimate for payment.

The CONTRACT lump sum price paid for Mobilization shall include full compensation for all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in Mobilization as specified herein.

Payments made for Mobilization will be excluded from consideration in determining compensation under changed quantities.

1-2.3 PAYMENT FOR AIRFIELD SAFETY AND TRAFFIC CONTROL. Airfield Safety and Traffic Control will be paid for at the contract lump sum price. This price shall include full compensation for all labor, materials, tools, equipment, and incidentals necessary to completing the work.

END OF SECTION

DIVISION V
SECTION 2
ITEM P-101
SURFACE PREPARATION

DESCRIPTION

2-1.1 This item shall consist of preparation of existing pavement surfaces for overlay, removal of existing pavement, and other miscellaneous items. The work shall be accomplished in accordance with these SPECIFICATIONS and the applicable drawings.

EQUIPMENT

2-2.1 All equipment shall be specified hereinafter or as approved by the ENGINEER. The equipment shall not cause damage to the pavement to remain in place.

CONSTRUCTION

2-3.1 REMOVAL OF EXISTING PAVEMENT

- A. Concrete.** The existing concrete to be removed shall be freed from the pavement to remain unless jackhammers are used for the complete removal. This shall be accomplished by line drilling or sawing through the complete depth of the slab one foot inside the perimeter of the final removal limits or outside the load transfer devices, whichever is greater. In this case, the limits of removal would be located on joints. If line drilling is used, the distance between holes shall not exceed the diameter of the hole. The pavement between the perimeter of the pavement removal and the saw cut or line-drilled holes shall be removed with a jackhammer. Where the perimeter of the removal limits is not located on the joint, the perimeter shall be saw cut 2 inches in depth or 1/4 the slab thickness, whichever is less. Again, the concrete shall be line drilled or saw cut the full depth of the pavement 6 inches inside the removal limits. The pavement inside the saw cut or line shall be broken by methods suitable to the CONTRACTOR; however, if the material is to be wasted on the airport site, it shall be reduced to a maximum size designated by the Airport OWNER. The CONTRACTOR's removal operation shall not cause damage to cables, utility ducts, pipelines, or drainage structures under the pavement. Any damage shall be repaired by the CONTRACTOR at no expense to the Airport OWNER.
- B. Asphaltic Concrete.** Asphaltic concrete pavement to be removed shall be cut to the full depth of the bituminous material around the perimeter of the area to be removed. The pavement shall be removed in such a manner that the joint for each layer of pavement replacement is offset one foot from the joint in the preceding layer. This does not apply if the removed pavement is to be replaced with concrete or soil. If the material is to be wasted on the Airport site, it shall be broken to a maximum size as designated by the Airport OWNER.

2-3.2 CONCRETE SPALL OR FAILED ASPHALTIC CONCRETE PAVEMENT REPAIR.

- A. **Asphaltic Concrete Pavement Repair.** The failed areas shall be removed as specified in paragraph 2-3.1b. All failed material including surface, base course, subbase course, and subgrade shall be removed. The base course and subbase shall be replaced if it has been infiltrated with clay, silt, or other material affecting the load-bearing capacity. Materials and methods of construction shall comply with the other applicable sections of this SPECIFICATION.

2-3.3 COLD PLANING.

- A. **Patching.** The machine shall be capable of cutting a vertical edge without chipping or spalling the edges of the pavement to remain. The machine shall have a positive method of controlling the depth of cut. The ENGINEER shall layout the area to be milled. The area shall be laid out with straightedges in increments of 1-foot widths. The area to be milled shall cover only the failed area. Any excessive area that is milled because the CONTRACTOR doesn't have the appropriate machine, or areas that are damaged because of his negligence, shall not be included in the measurement for payment.
- B. **Profiling, Grade Correction, or Surface Correction.** The machine shall have a minimum width of 10 feet. It shall be equipped with electronic grade control devices on both sides that will cut the surface to the grade and tolerances specified. The machine shall cut vertical edges. A positive method of dust control shall be provided. The machine shall be capable of discharging the millings in a truck or leaving them in a defined windrow.

METHOD OF MEASUREMENT

2-4.1 MEASUREMENT.

- A. **General.** If there is no quantity shown in the bidding schedule, the work covered by this section shall be considered as a subsidiary obligation of the CONTRACTOR covered under the other CONTRACT items. Only accepted work will be measured.
- B. **Pavement Removal.** The unit of measurement for pavement removal shall be the number of square yards removed by the CONTRACTOR. Any pavement removed outside the limits of removal because the pavement was damaged by negligence on the part of the CONTRACTOR shall not be included in the measurement for payment.
- C. **Joint and Crack Repair.** The unit of measurement for joint and crack repair shall be the linear foot of joint.
- D. **Paint and Rubber Removal.** The unit of measurement for paint and rubber removal shall be the square foot.
- E. **Spall and Failed Asphaltic Concrete Pavement Repair.**

1. The unit of measure for concrete spall repair shall be the number of square feet. The average depth of the patch shall be agreed upon by the CONTRACTOR and the Resident ENGINEER. The quantity shall be divided in the following categories:

- (a) 0 to 4 inches in average depth.
- (b) 4 to 8 inches in average depth.
- (c) Greater than 8 inches in average depth.

2. The unit of measure for failed asphaltic concrete pavement shall be as follows:

- (a) Asphaltic Concrete Square Yards.
- (b) Base Course Square Yards.
- (c) Subbase Course Square Yards.
- (d) Subgrade Square Yards.

F. **Cold Planing.** The unit of measure for cold planing shall be the number square yards. The average depth of the cold planing shall be determined by the ENGINEER and the CONTRACTOR prior to accomplishment of the work. When surface correction is required, if the initial cut doesn't correct the condition, the CONTRACTOR shall re-plane the area and will be paid only once for the total depth of planning. The quantity shall be divided into the following categories:

- (a) 0 to 2 inches
- (b) 0 to 3 inches
- (c) 0 to 4 inches
- (d) 0 to 5 inches
- (e) 0 to 6 inches

BASIS OF PAYMENT

2-5.1 PAYMENT. Payment shall be made at CONTRACT unit price for the unit of measurement as specified hereinbefore. This price shall be full compensation for furnishing all materials and for all preparation, hauling, and placing of the material and for all labor, equipment, tools, and incidentals necessary to complete this item.

END OF SECTION

DIVISION V
SECTION 3
ITEM P-153
CONTROLLED LOW STRENGTH MATERIAL (CLSM)

DESCRIPTION

3.1.1 This item shall consist of furnishing, transporting, and placing a controlled low-strength material (CLSM) as flowable backfill in trenches or at other locations shown on the PLANS or as directed by the ENGINEER.

MATERIALS

3-2.1 MATERIALS.

- A. **Portland Cement.** Portland cement shall conform to the requirements of ASTM C 150 Type II. If for any reason, cement becomes partially set or contains lumps of caked cement, it shall be rejected. Cement salvaged from discarded or used bags shall not be used.
- B. **Fly Ash.** Fly Ash shall conform to ASTM C 618, Class C or F.
- C. **Fine Aggregate (Sand).** Fine aggregate shall conform to the requirements of ASTM C 33 except for aggregate gradation. Any aggregate gradation which produces performance characteristics of the CLSM specified herein will be accepted, except as follows.

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
3/4 inch	100
No. 200	0 - 12

- D. **Water.** Water used in mixing shall be free of oil, salt, acid, alkali, sugar, vegetable matter, or other substances injurious to the finished product.

MIX DESIGN

3-3.1 **PROPORTIONS.** The CONTRACTOR shall submit, to the ENGINEER, a mix design including the proportions and source of materials, admixtures, and dry cubic yard batch weights. The mix shall contain a minimum of 50 pounds of cement and 250 pounds fly ash per cubic yard, with the remainder of the volume composed of sand, water, and any approved admixtures.

- A. **Compressive Strength.** CLSM shall be designed to achieve a 28-day compressive strength of 100 to 200 psi when tested in accordance with ASTM C 39. There should be no significant strength gain after 28 days. Test specimens shall be made in accordance with ASTM C 31 except that the samples will not be rodded or vibrated and shall be air cured in their molds for the duration of the cure period.

- B. Consistency.** Consistency of the fresh mixture shall be such that the mixture may be placed without segregation. A desired consistency may be approximated by filling an open-ended, 3-inch diameter cylinder, 6 inches high to the top, with the mixture and the cylinder immediately pulled straight up. The correct consistency of the mixture will produce an approximately 8-inch diameter, circular-type spread without segregation. Adjustments of the proportions of materials should be made to achieve proper solid suspension and flowable characteristics; however the theoretical yield shall be maintained at one cubic yard for the given batch weights.

CONSTRUCTION METHODS

3-4.1 PLACEMENT.

- A. Placement.** CLSM may be placed by any reasonable means from a mixing unit into the space to be filled. Agitation is required during transportation and waiting time. Placement shall be performed in such a manner that structures or pipes are not displaced from their desired final position and intrusion of CLSM into undesirable areas is avoided. The material shall be brought up uniformly to the fill line shown on the PLANS or as directed to the ENGINEER. Each placement of CLSM shall be as continuous an operation as possible. If CLSM is placed in more than one layer, the base layer shall be free of surface water and loose of foreign material prior to placement of the next layer.
- B. Limitations of Placement.** CLSM shall not be placed on frozen ground. Mixing and placing may begin when the air or ground temperature is at least 35°F and rising. At the time of placement, CLSM shall have a temperature of at least 40°F. Mixing and placement shall stop when the air temperature is 40°F and falling or when the anticipated air or ground temperature will be 35°F or less in the 24-hour period following proposed placement.

3-4.2 CURING AND PROTECTION.

- A. Curing.** The air in contact with the CLSM should be maintained at temperatures above freezing for a minimum of 72 hours. If the CLSM is subjected to temperatures below 32°F, the material may be rejected by the ENGINEER if damage to the material is observed.
- B. Protection.** The CLSM shall not be subject to loads and shall remain undisturbed by construction activities for a period of 48 hours or until a compressive strength of 15 psi is obtained. The CONTRACTOR shall be responsible for providing evidence to the ENGINEER that the material has reached the desired strength. Acceptable evidence shall be based upon compressive tests made in accordance with paragraph 3-3.1a.

MATERIAL ACCEPTANCE

3-5.1 ACCEPTANCE. Acceptance of CLSM delivered and placed as shown on the PLANS or as directed by the ENGINEER shall be based on mix design approval and batch tickets provided by the CONTRACTOR to confirm that the delivered material conforms to the mix design. The CONTRACTOR shall verify by additional testing, each 5,000 cubic yards of material used. Verification shall include confirmation of material proportions and tests of compressive strength to confirm that the material meets the original mix design and the requirements of CLSM as defined in this SPECIFICATION. Adjustments shall be made as necessary to the proportions and materials prior to further production.

METHOD OF MEASUREMENT

3-6.1 MEASUREMENT. Controlled low strength material shall be measured by the number of cubic yards as computed from the neatline plan and section, adjusted for the quantities for any embedments, and as specified, completed, and accepted.

BASIS OF PAYMENT

3-7.1 PAYMENT. Accepted quantities of controlled low strength material shall be paid for at the CONTRACT unit price per cubic yard. Payment shall be full compensation for all materials, equipment, labor, and incidentals required to complete the work as specified.

TESTING REQUIREMENTS

ASTM C 31 Making and Curing Concrete Test Specimens in the Field

ASTM C 39 Compressive Strength of Cylindrical Concrete

MATERIAL REQUIREMENTS

ASTM C 33 Specification for Concrete Aggregates

ASTM C 150 Specification for Portland Cement

ASTM C 618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete

ASTM C 595 Specification for Blended Hydraulic Cements

END OF SECTION

DIVISION V

SECTION 4

ITEM P-605

JOINT SEALING FILLER

DESCRIPTION

4-1.1 This item shall consist of providing and installing a resilient and adhesive joint sealing filler capable of effectively sealing joints and cracks in pavements.

MATERIALS

4-2.1 JOINT SEALERS. Joint sealing materials shall meet the requirements of ASTM D 6690 - *Joint and Crack Sealants, Hot-Applied, for Concrete and Asphalt Pavements*.

CONSTRUCTION METHODS

4-3.1 TIME OF APPLICATION. Joints shall be sealed as soon after completion of the curing period as feasible and before the pavement is opened to traffic, including construction equipment. The pavement temperature shall be above 50°F at the time of installation of the poured joint sealing material.

4-3.2 PREPARATION OF JOINTS.

- A. Sawing.** All joints shall be sawed in accordance with SPECIFICATIONS and PLAN details. Immediately after sawing the joint, the resulting slurry shall be completely removed from joint and adjacent area by flushing with a jet of water, and by use of other tools as necessary.
- B. Sealing.** Immediately before sealing, the joints shall be thoroughly cleaned of all remaining laitance, curing compound, and other foreign material. Cleaning shall be accomplished by sandblasting. Sandblasting shall be accomplished in a minimum of two passes. One pass per joint face with the nozzle held at an angle directly toward the joint face and not more than 3 inches from it. Upon completion of cleaning, the joints shall be blown out with compressed air free of oil and water. Only air compressors with operable oil and water traps shall be used to prepare the joints for sealing. The joint faces shall be surface dry when the seal is applied.

4-3.3 INSTALLATION OF SEALANTS. Joints shall be inspected for proper width, depth, alignment, and preparation, and shall be approved by the ENGINEER before sealing is allowed. Sealants shall be installed in accordance with the following requirements:

- A. Hot Poured Sealants.** The joint sealant shall be applied uniformly solid from bottom to top and shall be filled without formation of entrapped air or voids. A backing material shall be placed as shown on the PLANS and shall be *both nonreactive and nonadhesive* to the concrete or the sealant material. The heating kettle shall be an indirect heating type, constructed as a double boiler. A positive temperature control and mechanical agitation shall be provided. The sealant shall not be heated to more than 20°F below the safe heating temperature. The safe heating temperature can

be obtained from the manufacturer's shipping container. A direct connecting pressure type extruding device with nozzles shaped for insertion into the joint shall be provided. Any sealant spilled on the surface of the pavement, structures and/or lighting fixtures, shall be removed immediately.

METHOD OF MEASUREMENT

4-4.1 Joint sealing material shall be measured by the linear foot of sealant in place, completed, and accepted.

BASIS OF PAYMENT

4-5.1 Payment for joint sealing material shall be made at the CONTRACT unit price per linear foot. The price shall be full compensation for furnishing all materials, for all preparation, delivering, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Joint Sealing Filler – per linear foot

TESTING REQUIREMENTS

ASTM D 412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension
ASTM D 1644 Test Methods for Nonvolatile Content of Varnishes

MATERIAL REQUIREMENTS

ASTM D 1854 Jet-Fuel-Resistant Concrete Joint Sealer, Hot-Applied Elastic Type
ASTM D 3406 Joint Sealants, Hot-Applied, Elastomeric-Type, for Portland Cement Concrete Pavements
ASTM D 3569 Joint Sealant, Hot-Applied, Elastometric, Jet-Fuel-Resistant Type, for Portland Cement Concrete Pavements
ASTM D 3581 Joint Sealant, Hot-Applied, Jet-Fuel-Resistant Type, for Portland Cement Concrete and Tar-Concrete Pavements
ASTM D 5893 Standard SPECIFICATIONS for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements
ASTM D 6690 Joint and Crack Sealants, Hot-Applied, for Concrete and Asphalt Pavements
FED SPEC SS-S-200E(2) Sealants, Joint, Two-Component, Jet-Blast Resistant, Cold Applied

END OF SECTION

DIVISION V
SECTION 5
ITEM P-609B
ASPHALT REJUVENATING SEAL

DESCRIPTION

5-1.1 GENERAL. This item shall consist of applying a polymer modified, emulsified asphalt rejuvenation agent placed on the properly prepared asphalt concrete surface, in accordance with these SPECIFICATIONS, and the dimensions shown on the PLANS. Surface preparation shall be in conformance with Division V, Section X of these SPECIFICATIONS.

5-1.2 MATERIAL CONTRACTOR'S RESPONSIBILITY. Samples of all materials that the CONTRACTOR proposes to use, together with a statement as to their source and character, shall be submitted and approval in writing obtained by the ENGINEER before use of such materials begins.

5-1.3 SUBMITTALS. The CONTRACTOR shall furnish vendor's certified test reports for each load of rejuvenator seal delivered to the project. The report shall be submitted to the ENGINEER before permission will be granted for use of the material. The furnishing of the vendor's certified test report for the bituminous material shall not be interpreted as a basis for final acceptance. All such test reports shall be subject to verification by testing performed by the ENGINEER on samples of materials as received for use on the project and subsequent to in-place sampling.

A Certificate of Compliance shall be submitted ten (10) working days, minimum, and prior to the application of the test sections. In addition to the required signature of the vendor or the vendor's representative certifying compliance with job requirements, the certificate shall show the shipment number, type of material, refinery, consignee, destination, quantity, contract number or purchase order number, and date of shipment.

5-1.4 APPLICATION RATE. The application rate of the surface treatment shall be 0.12 gal per square yard for bidding purposes. The actual application rate shall be based on the results of test sections. Application rates from 0.10 to 0.14 gallons per square yard shall be paid for at the bid price. Any cost adjustments that may be warranted for a change in application rate will be negotiated in the field.

QUALITY CONTROL AND ASSURANCE

5-2.1 CONTRACTOR QUALITY CONTROL. The rejuvenating seal manufacturer's authorized representative shall be at the jobsite during all material application. The manufacturer's representative shall inspect the distributor truck(s) and verify that the truck(s) is in good working order and have the proper size spray nozzles. The manufacturer's representative shall be thoroughly knowledgeable of the materials, procedures, and equipment necessary to apply the product in accordance with this specification; shall be responsible for determining the final application rate and spray nozzle tip size; and shall oversee material storage and handling, the mixing of the component materials, and all application procedures of the rejuvenator seal. The manufacturer's representative shall have a minimum of two years' experience in the use of the approved seal. Documentation of this experience shall be furnished to the ENGINEER prior to the start of operations. The cost of the manufacturer's representative shall be included in the bid price.

The CONTRACTOR shall submit a contingency plan to the ENGINEER at least ten (10) days prior to applying asphalt rejuvenating agent. The contingency plan shall describe in detail the corrective actions the CONTRACTOR will use if the asphalt rejuvenating agent does not break within the times specified for pavement closures, or if treated surface friction characteristics are not in compliance. The plan shall include any materials required to be on hand, or additional equipment that must be available for contingency situations, and recommended corrective action to improve friction characteristics. The use of a corrective action(s) must be approved by ENGINEER before implementation.

Additionally, the CONTRACTOR shall place test sections as follows:

- A. **Test Sections.** At least ten (10) working days prior to full production, the CONTRACTOR shall place a series of 3 feet wide by 50 feet long test sections at initial application rates of 0.10, 0.12, and 0.14 gallons per square yard. One test section (3 application rates minimum) shall be required for each different asphalt surface. Additional application rates shall be provided as necessary to determine the optimum rate for each different pavement in the project. The test sections shall be subjected to the tests and examinations called for in paragraphs B below.
- B. **Friction Characteristics.** Friction testing will be performed on test areas prior to and 24 hours after application of the rejuvenator seal. The ENGINEER will test to determine pavement resistance/friction characteristics of the untreated asphalt surface, the proposed treated surface, and new AC pavement in accordance with ASTM E 303, or the resistance/friction level (MU values) of the pavement when measured using an approved Continuous Friction Measuring Equipment (CFME).

Test sections with friction readings greater than 20 percent below results obtained from tests on new AC pavement shall not be acceptable. The CONTRACTOR shall propose alternative methods to increase the coefficient of friction for the ENGINEER's approval prior to full production.

The treated pavement surface(s), after 24 hours of cure, shall be tested using a portable Wessex Skid Tester or CFME at the ENGINEER's option. Treated surfaces shall have a friction reading not greater than 20 percent below the readings obtained on new AC pavement.

5-2.2 QUALITY ASSURANCE TESTING. At the ENGINEER'S sole discretion additional skid resistance/friction tests may be performed for each 30,000 square yards or fractional part of each different pavement treated. QA tests will be performed after a 24 hour minimum cure period. The location of the tests will be randomly selected by the ENGINEER.

Treated surfaces shall have a friction reading not greater than 20 percent below the readings obtained on new AC or existing pavement. If satisfactory friction characteristics are not achieved, the CONTRACTOR shall implement an ENGINEER approved action plan to remedy the situation prior to opening pavement to aircraft traffic.

MATERIALS

5-3.1 MATERIAL. The emulsion for asphalt rejuvenating agent shall be a quick-break polymer modified pavement sealant and rejuvenator made from a base of asphalt, petroleum based recycling agent, and a polymer. The emulsion shall conform to either Table 1-A, and Table 1-B:

**Table 1-A
Polymer Modified Rejuvenating Emulsion**

Test on Emulsion	Method	Test Results
Viscosity @77 (SFS)	ASTM D244	20-100
Residue, w%, min.	ASTM D244	65
pH	ASTM E70	2.0-5.0
Sieve, w%, max.	ASTM D244	0.1
Oil distillate, w%, max.	ASTM D244	0.5
Test on Residue⁽¹⁾		
Viscosity @ 140°F, P, maximum.	ASTM D2171	3000
Penetration @ 39.2°F, minimum.	ASTM D5	70
Elastic Recovery on residue by distillation ^(1,2) , %, minimum.	AASHTO T59, T301	50
Test on Latex⁽³⁾:		
Tensile strength, die C dumbbell, psi, minimum	ASTM D412	500
Swelling in rejuvenating agent, % maximum; 48 hours exposure @ 104°F	ASTM D471 ⁽⁴⁾ Modified	40% intact film
<u>Specific Gravity</u>	ASTM 1475	1.08-1.15
Test on rejuvenating agent:		
Flash point, COC, °F	ASTM D92	> 380
Hot Mix Recycling Agent Classification	ASTM D4552	See Specification

Product Specification:

- (1) Exception to AASHTO T59: Bring the temperature on the lower thermometer slowly to 350°F plus or minus 10°F. Maintain at this temperature for 20 minutes. Complete total distillation in 60 plus or minus 5 minutes from first application of heat.
- (2) Elastic Recovery @ 10°C (50°F): Hour glass sides, pull 20 cm, hold 5 minutes then cut, let sit 1 hour.
- (3) Tensile Strength Determination: Samples for testing for tensile strength in accordance with ASTM D412 shall be cut using a die dumbbell at a crosshead speed of 20 in/min.
- (4) Latex Testing: Suitable substrate for film formation shall be polyethylene boards, silicone rubber sheeting, glass, or any substrate which produces a cured film of uniform cross-section. Polymer film shall be prepared from latex as follows:
Resistance to Swelling: Polymer films shall be formed by using a 50 mil drawdown bar and drawing down 50 mils of the latex on polyethylene boards. Films shall be cured for 14 days at 75°F and 50% humidity. Samples for resistance to swelling in rejuvenating agent shall be 1-inch by 2-inch rectangles cut from the cured film. Cut at least 3 specimens for each sample to be tested for swelling. Fill three 8 oz. ointment tins with at least a 1/2-inch deep of rejuvenating agent. Swelling samples shall be weighed and then placed in the ointment tins on top of the rejuvenating agent. Then, add at least another 1/2-inch deep of rejuvenating agent over each of

the latex samples. The ointment tins shall be covered and placed in an oven at 104°F for the specified 48 hours ± 15 minutes. The ointment tins are allowed to cool to 75°F and then the latex films are removed from the tins. Unabsorbed rejuvenating agent is removed from the intact latex film by scraping with a rubber policeman and blotting with paper towels. If the latex film does not remain intact during removal from the tins or while removing the unabsorbed rejuvenating agent, the sample shall be rejected. After the rejuvenating agent is removed from the samples they are then weighed. Percent swelling is reported as weight increase of the polymer film; report mass increase as a percent by weight of the original latex film mass upon exposure of films to the recycling agent.

Recycling Agent Specification:

Table 1-B

Product Tests	Rejuvenating Agent	
	Specs	Typical
Viscosity, 140°F, CST	50-175	150
Flash Point, °F, COC	380 Min.	400
Saturate, % by wt.	30 Max.	17
Asphaltenes	1.0 Max.	0
Chemical Composition	0.2-1.0	0.66
<u>N+A</u> <u>P+A</u> Compatibility	0.5 Min	0.83
<u>N</u> <u>P</u> Test on Residue		
Weight Change, %	6.5 Max.	3
Viscosity Ratio	3 Max.	1.3

5-3.2 MATERIAL QUALIFICATIONS. The emulsion supplier shall provide the ENGINEER with certified test results not older than 3 months, and two 1-quart samples of the finished polymer modified rejuvenating emulsion concentrate, rejuvenating agent, and the latex used in the emulsion. For the latex, certification must be from a laboratory with an ISO 17025 certification and accredited by IAS. Laboratories must be accredited in the test procedures described herein for the latex and the rejuvenating agents. Quality control testing of the samples shall be at the CONTRACTOR's expense.

For QA purposes, at any time during the execution of the work, the ENGINEER may require one quart samples be submitted for each of the following: 1) The emulsion from the emulsion delivery truck, 2) the rejuvenating agent from the emulsion manufacture's supplier, and 3) the polymer from the emulsion manufacture's supplier. Samples will be sent to an independent testing laboratory selected by the COUNTY. All testing shall be at the COUNTY's expense.

CONSTRUCTION METHODS

5-4.1 MIXING. The rejuvenator seal material shall be obtained by blending bituminous concentrate material, water, and polymer. The rejuvenator seal mixture shall be delivered to the site ready for application, unless otherwise approved by the ENGINEER. The weight of polymer added to the mix at the plant and the total weight of the mixture shall be submitted to the ENGINEER.

5-4.2 WEATHER LIMITATIONS. Bituminous material shall be applied only when the existing surface is dry and the atmospheric temperature is above 60°F. No material shall be applied when rain is imminent or when dust or sand is blowing.

5-4.3 EQUIPMENT AND TOOLS. The CONTRACTOR shall furnish all equipment, tools, and machines necessary for the performance of the work.

A. Pressure Distributor. The distributor shall be designed, equipped, maintained, and operated so that bituminous material may be applied uniformly on variable widths of surface at the specified rate. The allowable variation from the specified rate shall not exceed 10 percent during application operations. Distributor equipment shall include a tachometer, pressure gages, volume-measuring devices or a calibrated tank, and a thermometer for measuring temperatures of tank contents. The distributor shall be self-powered and shall be equipped with a power unit for the pump and full circulation spray bars adjustable laterally and vertically. Spray nozzle tips shall be properly sized for the product being applied in accordance with the rejuvenator seal manufacturer's recommendations.

B. Power Broom. A power broom/vacuum, Swartz 7000, or equivalent, shall be provided for removing loose material from the surfaces to be treated and final clean up of treated areas prior to opening to air traffic.

5-4.4 PREPARING UNDERLYING COURSE. The surface of the underlying course shall be prepared in accordance with Division V, Section X. All loose dirt and other objectionable material shall be removed from the surface by power broom/vacuum sweeper. Crack sealing shall be performed subsequent to placement of the rejuvenator seal.

5-4.5 APPLICATION OF BITUMINOUS MATERIAL. Bituminous material shall be applied upon the properly prepared surface at the rate and temperature specified using a pressure distributor to obtain uniform distribution at all points. To insure proper coverage, the strips shall begin along the centerline of the pavement on a crowned section or on the high side of the pavement with a one-way slope. During all applications, the surfaces of any adjacent structures or objects shall be protected in such manner as to prevent their being spattered or otherwise marred.

The rejuvenator fog seal shall be spread at the rate (gallons per square yard) determined by test section, or as directed by the manufacturer's agent, subject to the ENGINEER's approval. Any change in rate of application must be approved by the ENGINEER. The application shall provide uniform coverage and shall be free of streaks and voids.

The CONTRACTOR shall schedule seal coat operations such that the asphalt rejuvenation seal will break (turn from brown to black) before the atmospheric temperature falls below 50°F, and with a sufficient allowance for cure time so that the pavement is marked and opened to traffic as scheduled.

5-4.7 CORRECTION OF DEFECTS. Any defects, such as lack of uniformity in the application coverage (streaking or voids), or other imperfections caused by faulty workmanship or application methods, shall be corrected to the satisfaction of the ENGINEER.

All defective materials resulting from improper storage, handling, workmanship, or application procedures shall be removed by the CONTRACTOR and replaced with approved materials as provided for in these specifications.

METHOD OF MEASUREMENT

5-5.1 The Pavement Rejuvenator Seal shall be measured by the square yard of applied and accepted by the ENGINEER rejuvenator seal.

BASIS OF PAYMENT

5-6.1 Payment will be made at the CONTRACT unit price per square yard for pavement rejuvenating seal. These prices shall be full compensation for furnishing all materials and for all preparation, hauling and application of the materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment shall be made under:

"Pavement Rejuvenating Seal" – per square yard (Bid Alternate No. 1)

TESTING REQUIREMENTS

Federal Aviation Administration Advisory Circular 150/5320-12, "Measurement, Construction, and Maintenance of Skid-Resistant Airport Pavement Surfaces, Chapter 3, Section IV, Conducting Friction Evaluation with CFME."

ASTM D 2172	Quantitative Extraction of Bitumen from Bituminous Paving Mixtures
ASTM D 3666	Inspection and Testing Agencies for Bituminous Paving Materials
ASTM E 303	Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
CT 342	California Portable Test
ASTM E 274	Skid Trailer
ASTM E 503	Diagonal Brake Vehicle equipped with ASTM E 524 (smooth test tire inflated to 24 psi).

END OF SECTION

DIVISION V
SECTION 6
ITEM P-620
RUNWAY AND TAXIWAY PAINTING

DESCRIPTION

6-1.1 This item shall consist of the painting of numbers, markings, and stripes on the surface of runways, taxiways, and aprons, in accordance with these SPECIFICATIONS and at the locations shown on the PLANS, or as directed by the ENGINEER.

MATERIALS

6-2.1 MATERIALS ACCEPTANCE. The CONTRACTOR shall furnish manufacturer's certified test reports for materials shipped to the project. The certified test reports shall include a statement that the materials meet the SPECIFICATION requirements. The reports can be used for material acceptance or the ENGINEER may perform verification testing. The reports shall not be interpreted as a basis for payment. The CONTRACTOR shall notify the ENGINEER upon arrival of a shipment of materials to the site.

6-2.2 PAINT. Paint shall be Waterborne in accordance with the requirements of paragraph 6-2.2A. Paint shall be furnished in White - 37925, Yellow - 33538 or 33655 and Blue - per Caltrans in accordance with Federal Standard No 595.

A. Waterborne. Paint shall meet the requirements of Federal Specification TT-P-1952E, Type II.

6-2.3 REFLECTIVE MEDIA. Glass beads shall meet the requirements for Federal Specification TT-B-1325D, Type III. Glass beads shall be treated with all compatible coupling agents recommended by the manufacturers of the paint and reflective media to ensure adhesion and embedment.

CONSTRUCTION METHODS

6-3.1 WEATHER LIMITATIONS. The painting shall be performed only when the surface is dry and when the surface temperature is at least 45°F and rising and the pavement surface temperature is at least 5°F above the dew point. Markings shall not be applied when the pavement temperature is greater than 120°F.

6-3.2 EQUIPMENT. Equipment shall include the apparatus necessary to properly clean the existing surface, a mechanical marking machine, a bead dispensing machine, and such auxiliary hand-painting equipment as may be necessary to satisfactorily complete the job.

The mechanical marker shall be an atomizing spray-type marking machine suitable for application of traffic paint. It shall produce an even and uniform film thickness at the required coverage and shall apply markings of uniform cross sections and clear-cut edges without running or spattering and without over spray.

6-3.3 PREPARATION OF SURFACE. Immediately before application of the paint, the surface shall be dry and free from dirt, grease, oil, laitance, or other foreign material that would reduce the bond between the paint and the pavement. The area to be painted shall be cleaned by sweeping and blowing or by other methods as required to remove all dirt, laitance, and loose materials without damage to the pavement surface. Use of any chemicals or impact abrasives during surface preparation shall be approved in advance by the ENGINEER. Paint shall not be applied to Portland cement concrete pavement until the areas to be painted are clean of curing material. Sandblasting or high-pressure water shall be used to remove curing materials.

6-3.4 LAYOUT OF MARKINGS. The proposed markings shall be laid out in advance of the paint application. The locations of markings to receive glass beads shall be shown on the PLANS.

6-3.5 APPLICATION. Paint shall be applied at the locations and to the dimensions and spacing shown on the PLANS. Paint shall not be applied until the layout and condition of the surface has been approved by the ENGINEER. The edges of the markings shall not vary from a straight line more than 1/2-inch in 50 feet and marking dimensions and spacings shall be within the following tolerances:

Dimension and Spacing	Tolerance
36 inches or less	±1/2 inch
greater than 36 inches to 6 feet	± 1 inch
greater than 6 feet to 60 feet	± 2 inches
greater than 60 feet	± 3 inches

The paint shall be mixed in accordance with the manufacturer's instructions and applied to the pavement with a marking machine at the rate(s) shown in Table 1. The addition of thinner will not be permitted. A period of 24 hours shall elapse between placement of a bituminous surface course or seal coat and first application of the paint with no glass beads. *Thirty (30) days following, a final application with glass beads shall be applied.*

TABLE 1. APPLICATION RATES FOR PAINT AND GLASS BEADS

Paint Type	Paint Square feet per gallon, ft ² /gal	Glass Beads, Type III Pounds per gallon of paint—lb./gal.
Waterborne	115 ft ² /gal. maximum	10 lb./gal. minimum

Glass beads shall be distributed upon the marked areas at the locations shown on the PLANS to receive glass beads immediately after application of the paint. A dispenser shall be furnished which is properly designed for attachment to the marking machine and suitable for dispensing glass beads. Glass beads shall be applied at the rate(s) shown in Table 1. Glass beads shall not be applied to black paint. Glass beads shall adhere to the cured paint or all marking operations shall cease until corrections are made.

All emptied containers shall be returned to the paint storage area for checking by the ENGINEER. The containers shall not be removed from the airport or destroyed until authorized by the ENGINEER.

6-3.6 PROTECTION AND CLEANUP. After application of the paint, all markings shall be protected from damage until the paint is dry. All surfaces shall be protected from excess moisture and/or rain and from disfiguration by spatter, splashes, spillage, or drippings of paint. The CONTRACTOR shall remove from the site all debris, waste, loose or unadhered reflective media, and by-products generated by the surface preparation and application operations to the satisfaction of the ENGINEER. The CONTRACTOR shall dispose of these wastes in strict compliance with all applicable state, local, and Federal environmental statutes and regulations.

METHOD OF MEASUREMENT

6-4.1 The quantity of runway and taxiway markings to be paid for shall be the number of square feet of painting in accordance with the SPECIFICATIONS and accepted by the ENGINEER.

BASIS OF PAYMENT

6-5.1 Payment shall be made at the respective CONTRACT price per square foot for runway and taxiway painting. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item. *Glass beads shall be incidental to the cost of painting.*

Payment will be made under:

Runway and Taxiway Painting - per square foot

TESTING REQUIREMENTS

ASTM C 136	Sieve Analysis of Fine and Coarse Aggregates
ASTM C 146	Chemical Analysis of Glass Sand
ASTM C 371	Wire-Cloth Sieve Analysis of Nonplastic Ceramic Powders
ASTM D 92	Test Method for Flash and Fire Points by Cleveland Open Cup
ASTM D 711	No-Pick-Up Time of Traffic Paint
ASTM D 968	Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D 1213-54(1975)	Test Method for Crushing Resistance of Glass Spheres
ASTM D 1652	Test Method for Epoxy Content of Epoxy Resins
ASTM D 2074	Test Method for Total Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method
ASTM D 2240	Test Method for Rubber Products-Durometer Hardness

ASTM G 15453

Operating Light and Water-Exposure Apparatus (Fluorescent Light Apparatus UV-Condensation Type) for Exposure of Non-metallic Materials.

Federal Test Method,
Standard No. 141D/GEN

Paint, Varnish, Lacquer and Related Materials; Methods of Inspection, Sampling and Testing

MATERIAL REQUIREMENTS

ASTM D 476

Specifications for Dry Pigmentary Titanium Dioxide Pigments Products

Code of Federal Regulations

40 CFR Part 60, Appendix A – Definition of Traverse Point Number and Location

Code of Federal Regulations

29 CFR Part 1910.1200 – Hazard Communications

FED SPEC TT-B-1325D

Beads (Glass Spheres) Retroreflective

AASHTO M 247

Glass Beads Used in Traffic Paints

FED SPEC TT-P-1952E

Paint, Traffic and Airfield Marking, Waterborne

Commercial Item
Description (CID) A-A-2886B

Paint, Traffic, Solvent Based

FED STD 595

Colors used in Government Procurement

END OF SECTION

DIVISION V
SECTION 7
AGGREGATE BASES
(MODIFIED CALTRANS)

DESCRIPTION

7-1.1 GENERAL. This work shall consist of furnishing, spreading and compacting aggregate bases as specified in these specifications and the special provisions.

Aggregate bases are designated as Class 2 and Class 3. The class of aggregate base will be shown on the PLANS or specified in the special provisions.

7-1.2 PREQUALIFICATION OF MATERIALS. The CONTRACTOR shall provide test results for prequalification of materials used in this item. Submittals of these test results must be received by the ENGINEER no less than ten (10) working days prior to placement of materials. No separate payment shall be made for prequalifying tests.

7-1.3 MATERIALS. Aggregate for the various classes of aggregate base at the time it is deposited on the roadbed shall conform to the following requirements:

- A. Class 2 Aggregate Base.** Aggregate for Class 2 aggregate base shall be free from organic matter and other deleterious substances, and shall be of such nature that it can be compacted readily under watering and rolling to form a firm, stable base. Aggregate may include material processed from reclaimed asphalt concrete, portland cement concrete, lean concrete base, cement treated base or a combination of any of these materials. The amount of reclaimed material shall not exceed 50 percent of the total volume of the aggregate used.

Aggregate shall conform to the grading and quality requirements shown in the following tables. At the option of the CONTRACTOR, the grading for either the 1 1/2-inch maximum or 3/4-inch maximum shall be used, except that once a grading is selected the grading shall not be changed without the ENGINEER's written approval.

AGGREGATE GRADING REQUIREMENTS

Sieve Sizes	Percentage Passing			
	1 1/2" Maximum		3/4" Maximum	
	Operating Range	Contract Compliance	Operating Range	Contract Compliance
2"	100	100	—	—
1 1/2"	90-100	87-100	—	—
1"	—	—	100	100
3/4"	50-85	45-90	90-100	87-100
No. 4	25-45	20-50	35-60	30-65
No. 30	10-25	6-29	10-30	5-35
No. 200	2-9	0-12	2-9	0-12

QUALITY REQUIREMENTS

Test	Operating Range	Contract Compliance
Resistance (R-value)	—	78 Min.
Sand Equivalent	25 Min.	22 Min.
Durability Index	—	35 Min.

The aggregate shall not be treated with lime, cement or other chemical material before the Durability Index test is performed. Untreated reclaimed asphalt concrete and portland cement concrete will not be considered to be treated with lime, cement or other chemical material for purposes of performing the Durability Index test.

If the results of either or both the aggregate grading and Sand Equivalent tests do not meet the requirements specified for "Operating Range" but meet the "Contract Compliance" requirements, placement of the aggregate base may be continued for the remainder of that day. However, another day's work may not be started until tests, or other information, indicate to the satisfaction of the ENGINEER that the next material to be used in the work will comply with the requirements specified for "Operating Range."

If the results of either or both the aggregate grading and Sand Equivalent tests do not meet the requirements specified for "Contract Compliance," the aggregate base which is represented by these tests shall be removed. However, if requested by the CONTRACTOR and approved by the ENGINEER, the aggregate base may remain in place, and the CONTRACTOR shall pay to the State \$2.25 per cubic yard for the aggregate base represented by the tests and left in place. The Department may deduct this amount from any moneys due, or that may become due, the CONTRACTOR under the contract. If both the aggregate grading and Sand Equivalent do not conform to the "Contract Compliance" requirements, only one adjustment shall apply.

No single aggregate grading or Sand Equivalent test shall represent more than 500 cubic yards or one day's production, whichever is smaller.

B. Class 3 Aggregate Base. Aggregate for Class 3 aggregate base shall conform to the requirements set forth in the special provisions. Aggregate may include material processed from reclaimed asphalt concrete, portland cement concrete, lean concrete base, cement treated base or a combination of any of these materials. The amount of reclaimed material shall not exceed 50 percent of the total volume of the aggregate used.

The grading of aggregate for Class 3 aggregate base shall, at the option of the CONTRACTOR, conform either to the grading specified in the special provisions or to either the 1 1/2-inch maximum or the 3/4-inch maximum grading for Class 2 aggregate base specified in Section 7-1.3A, "Class 2 Aggregate Base." Once a grading is selected, the grading shall not be changed without written approval of the ENGINEER.

7-1.4 SUBGRADE. The subgrade to receive aggregate base, immediately prior to spreading shall conform to the compaction and elevation tolerance specified for the material involved, and shall be free of loose or extraneous material.

When aggregate base is paid for by the cubic yard, areas of the finished surface of aggregate subbase which are lower than the grade established by the ENGINEER shall be filled with aggregate base. Volumes of aggregate base so placed will not be included in the volume calculated for payment.

When aggregate subbase is not specified and aggregate base is paid for by the cubic yard, areas of the grading plane which are lower than the grade established by the ENGINEER may be filled with aggregate base. Volumes of aggregate base so placed will not be included in the volume calculated for payment as stated above. If basement material consists of imported borrow, aggregate base placed below the grade established by the ENGINEER will not be measured or paid for as imported borrow.

A. Adding Water. At the time aggregate base is spread it shall have a moisture content sufficient to obtain the required compaction. The moisture shall be uniformly distributed throughout the material.

7-1.5 SPREADING. Aggregate bases shall be delivered to the roadbed as uniform mixtures. The mixture shall be deposited and spread to the required compacted thickness within the tolerances specified in Section 7-1.5, "Compacting," by means which will maintain the uniformity of the mixture. Each layer shall be free from pockets of coarse or fine material.

Where the required thickness is 0.50-foot or less, the base material may be spread and compacted in one layer. Where the required thickness is more than 0.50-foot, the base material shall be spread and compacted in 2 or more layers of approximately equal thickness, and the maximum compacted thickness of any one layer shall not exceed 0.50-foot.

Aggregate bases, placed on road approaches and connections, street intersection areas, median strip areas, shoulder areas, and at locations which are inaccessible to the spreading equipment, may be spread in one or more layers by any means to obtain the specified results.

When the subgrade for aggregate base consists of cohesionless sand, and written permission is granted by the ENGINEER, a portion of the aggregate base may be dumped in piles upon the subgrade and spread ahead from the dumped material in sufficient quantity to stabilize the subgrade. Segregation of aggregate shall be avoided and each layer shall be free from pockets of coarse or fine material.

7-1.6 COMPACTING. The relative compaction of each layer of compacted base material shall be not less than 95 percent.

The surface of the finished aggregate base at any point shall not vary more than 0.05-foot above or below the grade established by the ENGINEER.

When aggregate base is paid for by the cubic yard, and at locations where the planned thickness of aggregate base, less allowable tolerance, is not obtained, the CONTRACTOR shall take such corrective measures as are necessary to obtain that thickness. If requested by the CONTRACTOR and permitted by the ENGINEER, a deduction will be made from contract payment for aggregate base in lieu of correcting the deficient thickness. The deduction will be computed as the product of (a) the deficient thickness less allowable tolerance; (b) the planned width; and (c) the longitudinal distance between locations showing specified thickness, all as determined by the ENGINEER, multiplied by a fixed price of \$17.00 per cubic yard, or the contract bid price, whichever is higher.

Base which does not conform to the above requirements shall be reshaped or reworked, watered and thoroughly recompact to conform to the specified requirements.

MEASUREMENT

7-2.1 Quantities of aggregate base to be paid for by the ton will be measured in conformance with the provisions in State Standard Specifications Section 9-1.01, "Measurement of Quantities," and in this Section 7-1.6.

The weight of material to be paid for will be determined by deducting from the weight of material delivered to the work, the weight of water in the material, at the time of weighing, as determined by California Test 226, in excess of one percentage point more than the optimum moisture content as determined by California Test 216. The weight of water deducted in conformance with the provisions in this Section 7-1.6 will not be paid for.

Quantities of aggregate base to be paid for by the cubic yard will be calculated on the basis of the dimensions shown on the PLANS adjusted by the amount of any change ordered by the ENGINEER. No allowance will be made for aggregate base placed outside those dimensions unless otherwise ordered by the ENGINEER.

PAYMENT

7-3.1 Quantities of aggregate base will be paid for at the contract price per ton or cubic yard, whichever unit is designated in the contract item, for the class or classes involved.

The above prices and payments shall include full compensation for furnishing all labor, materials tools, equipment, and incidentals, and for doing all the work involved in constructing aggregate base, complete in place, as shown on the PLANS, and as specified in these specifications and the special provisions, and as directed by the ENGINEER.

END OF SECTION

DIVISION V
SECTION 8
ASPHALT CONCRETE
(MODIFIED 2006 CALTRANS)

DESCRIPTION

8-1.1 GENERAL. This work shall consist of furnishing and mixing aggregate and asphalt binder at a central mixing plant, spreading, and compacting the mixture as specified in these SPECIFICATIONS and as shown on the PLANS.

Asphalt concrete shall be California State Type A, 1/2 inch maximum aggregate (medium) and shall be produced in a batch mixing plant, a continuous pugmill mixing plant or a drier-drum mixing plant. Proportioning shall be either by hot-feed control or cold feed control.

8-1.2 JOB MIX FORMULA. No bituminous mixture for payment shall be produced until a job mix formula conforming to California State Standards has been approved by the ENGINEER. The Type A, 1/2-inch maximum, medium job mix formula shall be a recent (less than 6 months old) Caltrans mix design or a mix design shall be prepared specifically for this Project. The job mix formula shall be submitted in writing by the CONTRACTOR to the ENGINEER *within the first ten (10) days of the Mobilization phase*. The job mix formula submittal shall include test property curves (unit weight, percent voids, and Hveem stability vs. percent asphalt) and all test data used to develop the job mix formula.

With the job mix formula (JMF) submittal, submit the following:

1. California Test 204 plasticity index results
2. California Test 371 tensile strength ratio (TSR) results for untreated HMA
3. California Test 371 tensile strength ratio (TSR) results for treated HMA if untreated HMA tensile strength is below 70. Asphalt with TSR below 70 shall be treated with a liquid antistripping agent approved by the ENGINEER and the resulting TSR shall be at least 70.

The approved job mix formula shall be in effect until modified in writing by the ENGINEER. Should a change in sources of materials be made, a new job mix formula shall be established before the new material is used.

8-1.3 PREQUALIFICATION OF MATERIALS. The CONTRACTOR shall provide all test results for prequalification of materials used in this item. Submittals of these test results shall be made with the job mix formula. No separate payment will be made for prequalification tests

MATERIALS

8-2.1 ASPHALT CEMENT. Asphalt cement shall be PG 64-10. Asphalt shall conform to Section 92, "Asphalts", of the State Standard Specifications.

8-2.2 AGGREGATE. All aggregates shall be clean and free from decomposed materials, organic material and other deleterious substances. Coarse aggregate is material retained on the No. 4 sieve; fine aggregate is material passing the No. 4 sieve; and supplemental fine aggregate is added fine material passing the No. 30 sieve, including dust from dust collectors.

The combined aggregate, prior to the addition of asphalt binder, shall conform to the requirements of this Section. Aggregate samples for testing will be obtained from plant bins or the cold feed in advance of the mixing drum. Conformance with the grading requirements will be determined by California Test 202, modified by California Test 105 when there is a difference in specific gravity of 0.2 or more between the coarse and fine portions of the aggregate or between blends of different aggregates. If the results do not fall within the limits shown under "Operating Range", but are within limits for "Contract Compliance", placement of asphalt concrete may be continued for the remainder of that day. However, another day's work may not be started until tests, or other information, indicate to the satisfaction of the ENGINEER that the next material to be used in the work will comply with the requirement for "Operating Range".

If the results of grading tests are not within the limits for "Contract Compliance", the asphalt concrete represented by these tests shall be removed unless the ENGINEER determines that said asphalt concrete is structurally adequate and may remain in place. No single grading test shall represent more than 500 tons of aggregate or one day's paving, whichever is smaller.

In the table below, the symbol "X" is the gradation which the CONTRACTOR proposed to furnish for the specific sieve. The proposed gradation shall meet the gradation shown in the table under "Limits of Proposed Gradation". Changes from one mix design to another shall not be made during the progress of the work unless permitted by the ENGINEER. However, changes in proportions to conform to the approved job mix formula shall not be considered changes in mix design.

Sieve Sizes	Limits of Proposed Gradation	Operating Range	Contract Compliance
3/4"	100	100	100
1/2"	95-100	95-100	89-100
3/8"	80-95	80-95	75-100
No. 4	59-66	X±5	X±8
No. 8	43-49	X±5	X±8
No. 30	22-27	X±5	X±8
No. 200	3-8	3-8	0-11

The combined aggregate shall conform to the following quality requirements prior to addition of the asphalt cement:

Tests	Test Method No. California	Asphalt Concrete Type A
Percentage of Crushed Particles Coarse Aggregate (Min.) Fine Aggregate (Passing No. 4, Retained on No. 8) (Min.)	205	90% 70%
Los Angeles Rattler Loss at 500 rev. (Max.)	211	45%
Sand Equivalent Contract Compliance (Min.) Operating Range (Min.)	217	47 50
k_o Factor (Max.)	303	1.7
k_f Factor (Max.)	303	1.7

The water absorption value of the entire blend of aggregate shall not exceed 2.5 percent as determined by ASTM C 127 and C 128. These tests shall be included in the prequalification tests provided by the CONTRACTOR. Testing during construction for quality control will be performed by the ENGINEER at no cost to the CONTRACTOR. The frequency of this testing will be determined by the ENGINEER except that sand equivalent tests will be performed concurrently with aggregate gradation tests. If the test results do not meet the requirements listed, above production shall be terminated until the CONTRACTOR can satisfy the ENGINEER that the necessary corrections have been made and that production meets specification. The CONTRACTOR shall be responsible for all testing required to bring the materials back into specification.

8-2.3 BITUMINOUS MIXTURE. The asphalt concrete mixture, composed of the asphalt concrete and aggregate proposed for use and at the job mix formula optimum percentages as determined by Test Method No. California 367, shall have the following material properties:

Tests	California Test	Asphalt Concrete Type A
Swell (Max.)	305	0.030"
Moisture Vapor Susceptibility (Min.)	307	30
Stabilometer Value (Min.)	366	37

8-2.4 STORAGE. Storage and drying of materials shall be as indicated in the State Standard Specifications, Section 39-3.01, "Storage" and 39-3.02, as appropriate for the type of material and plant.

8-2.5 PROPORTIONING. Proportioning of materials shall conform to appropriate methods in the State Standard Specifications, Section 39-3.03, "Proportioning".

8-2.6 MIXING. Mixing shall be in conformance with Section 39-3.04 of the State Standard Specifications.

8-2.7 TEST SECTION. Prior to full production, the CONTRACTOR shall prepare and place a quantity of bituminous mixture according to the job mix formula. The amount of mixture should be sufficient to construct a test section 300 feet long and 20 feet wide, placed in two lanes with a longitudinal cold joint, and shall be of the same depth specified for the construction of the course which it represents. The underlying grade or pavement structure upon which the test section is to be constructed shall be the same as the remainder of the course represented by the test section. The equipment used in construction of the test section shall be the same type and weight to be used on the remainder of the course represented by the test section.

Random samples shall be taken at the plant, or behind the paver, and tested for stabilometer value, aggregate gradation, and asphalt content. Three randomly selected cores shall be taken from the finished pavement mat, and three from the longitudinal joint, and tested in accordance with Paragraph 3.4.

The test section shall be considered acceptable if: (1) the stabilometer value exceeds the specified minimum, (2) aggregate gradations are within the operating range limits specified in Paragraph 2.2, (3) the percentage asphalt is within 0.5% of the optimum amount in the job mix formula, and (4) the relative compaction exceeds 95%.

If the initial test section should prove to be unacceptable, the necessary adjustments to the job mix formula, plant operation, placing procedures, and/or rolling procedures shall be made. A second test section shall then be placed. If the second test section also does not meet specification requirements, both sections shall be removed at the CONTRACTOR's expense. Additional test sections, as required, shall be constructed and evaluated for conformance to the SPECIFICATIONS. Any additional sections that are not acceptable shall be removed at the CONTRACTOR's expense. Full production shall not begin until an acceptable section has been constructed and accepted by the ENGINEER. Testing of the initial test sections shall be paid for by the OWNER. Should the initial test section fail to meet specification requirements, testing of subsequent test sections shall be paid for by the CONTRACTOR.

Job mix control testing shall be performed by the CONTRACTOR at the start of plant production and in conjunction with the calibration of the plant for the job mix formula. It should be recognized that the aggregates produced by the plant may not satisfy the gradation requirements or produce a mix that exactly meets the job mix formula. In those instances, it will be necessary to re-evaluate and re-design the mix using plant-produced aggregates. Specimens should be prepared, and the optimum bitumen content determined in the same manner as for the original design tests.

CONSTRUCTION METHODS

8-3.1 GENERAL REQUIREMENTS. Unless lower temperatures are directed by the ENGINEER, all mixtures, shall be spread, and the first coverage of initial or breakdown compaction shall be performed when the temperature of the mixture is not less than 275°F, and all breakdown compaction shall be completed before the temperature of the mixture drops below 250°F.

Asphalt concrete shall be placed only when the atmospheric temperature is above 50°F. Asphalt concrete base shall be placed only when the atmospheric temperature is above 40°F.

Asphalt concrete and asphalt concrete base shall not be placed when the underlying layer or surface is frozen, or when, in the opinion of the ENGINEER, weather conditions will prevent the proper handling, finishing, or compaction of the mixtures.

Asphalt concrete base shall be spread and compacted in one or more layers. Each layer of asphalt concrete shall not exceed 0.25-foot in compacted thickness unless approved by the ENGINEER.

A layer shall not be placed over another layer until the temperature of the lower layer is less than 160°F at mid depth.

Asphalt concrete and asphalt concrete base to be placed on shoulders and other areas off the traveled way having a width of 5 feet or more, shall be spread in the same manner as specified above. When the shoulders and other areas are less than 5 feet in width, the material may be deposited and spread in one or more layers by any mechanical means that produce a uniform smoothness and texture. Unless otherwise shown on the PLANS, asphalt mixtures shall not be handled, spread or windrowed in a manner that will stain the finished surface of any pavement or other improvements.

The completed mixture shall be deposited on the roadbed at a uniform quantity per linear foot, as necessary to provide the required compacted thickness without resorting to spotting, picking-up or otherwise shifting the mixture.

Segregation shall be avoided, and the surfacing shall be free from pockets of coarse or fine material. Asphalt concrete or asphalt concrete base containing hardened lumps shall not be used.

Longitudinal joints in all other layers shall be offset not less than 1-foot alternately each side of the edges of traffic lanes. The ENGINEER may permit other patterns of placing longitudinal joints if he considers that such patterns will not adversely affect the quality of the finished product.

Unless otherwise provided herein or permitted by the ENGINEER, the top layer of asphalt concrete for shoulders, tapers, transitions, curve widenings, and other such areas, shall not be spread before the top layer of asphalt concrete for the adjoining pavement has been spread and compacted. At locations where the number of lanes is changed, the top layer for the through lanes shall be paved first. When existing pavement is to be surfaced and the specified thickness of asphalt concrete to be spread and compacted on the existing pavement is 0.20-foot or less, shoulders or other adjoining areas may be spread simultaneously with the through lane provided the completed surfacing conforms to the requirements of these specifications. Tracks or wheels of spreading equipment shall not be operated on the top layer of asphalt concrete in any area until final compaction has been completed.

At locations shown on the PLANS, specified in the special provisions or as directed by the ENGINEER, the asphalt concrete shall be tapered or feathered to conform to existing surfacing or to other facilities.

At locations where the asphalt concrete is to be placed over the areas inaccessible to spreading and rolling equipment, the asphalt concrete shall be spread by any means to obtain the specified results and shall be compacted thoroughly to the required lines, grades and cross sections by means of pneumatic tampers, or by other methods that will produce the same degree of compaction as pneumatic tampers.

8-3.2 SPREADING. In advance of spreading asphalt concrete over an existing base, surfacing, or pavement, if ordered by the ENGINEER, asphalt concrete shall be spread to level irregularities, and to provide a smooth base in order that subsequent layers will be of uniform thickness. No additional compensation will be allowed for spreading asphalt concrete as above specified, and full compensation for all work incidental to such operations will be considered as included in the contract price paid for the asphalt concrete.

When directed by the ENGINEER, bituminous binder shall be applied to any layer in advance of spreading the next layer.

Before placing the top layer adjacent to cold transverse construction joints, such joints shall be trimmed to a vertical face and to neat line. Transverse joints shall be tested with a 12 foot straightedge and shall be cut back as required to conform to the requirements specified in Paragraph 8-3.3, "Compacting", for surface smoothness. Connections to existing surfacing shall be feathered to conform to the requirements for smoothness. Longitudinal joints shall be trimmed to a vertical face and to a neat line if the edges of the previously laid surfacing are, in the opinion of the ENGINEER, in such condition that the quality of the completed joint will be affected.

All layers, except as otherwise provided in these SPECIFICATIONS, shall be spread with an asphalt paver. Asphalt pavers shall be operated in such a manner as to insure continuous and uniform movement of the paver.

8-3.3 COMPACTING. Compacting equipment shall conform to the provisions of Paragraph 8-4.2, "Compacting Equipment".

A pass shall be one movement of a roller in either direction. A coverage shall be as many passes as are necessary to cover the entire width being paved. Overlap between passes during any coverage, made to ensure compaction without displacement of material in accordance with good rolling practice, shall be considered to be part of the coverage being made and not part of a subsequent coverage. Each coverage shall be completed before subsequent coverages are started.

Rolling shall commence at the lower edge and shall progress toward the highest portion, except that when compacting layers which exceed 0.25 foot in compacted thickness, and if directed by the ENGINEER, rolling shall commence at the center and shall progress outward.

Asphalt concrete shall be compacted to relative compaction of not less than 95 percent as determined in accordance with Paragraph 8-3.4, "Relative Compaction Acceptance and Testing."

The completed surfacing shall be thoroughly compacted, smooth, and free from ruts, humps, depressions, or irregularities. Any ridges, indentations or other objectionable marks left in the surface of the asphalt concrete by blading or other equipment shall be eliminated by rolling or other means. The use of any equipment that leaves ridges, indentations, or other objectionable marks in the asphalt concrete shall be discontinued, and other acceptable equipment shall be furnished by the CONTRACTOR.

8-3.4 RELATIVE COMPACTION ACCEPTANCE SAMPLING AND TESTING. Asphalt concrete shall be compacted to a relative compaction of not less than 95 percent of the density of laboratory specimens compacted in conformance with California Test 304. In-place density of asphalt concrete will be determined from cores in accordance with California Test 308. Three cores of the finished pavement shall be taken for each lot. A lot shall be 1/2-day's paving.

A. Sampling. Cores of the finished, compacted pavement shall be taken by the CONTRACTOR. Core locations shall be marked by the ENGINEER. Samples shall be neatly cut with a core drill. The cutting edge of the core drill bit shall be of hardened steel or other suitable material with diamond chips embedded in the metal cutting edge. The minimum diameter of the sample shall be