

# **DIVISION III**

## **Special Provisions**

**DIVISION III  
SPECIAL PROVISIONS**

SECTION 1 – TERMS, DEFINITIONS, ABBREVIATIONS, AND SYMBOLS

1-2 DEFINITIONS

COUNTY: County of Riverside  
BOARD: Board of Supervisors of Riverside County  
ENGINEER: MEAD & HUNT, INC.

1-2.1 DEFINITIONS FOR AIRPORT CONSTRUCTION PROJECTS

Whenever the following terms are used in these specifications, in the CONTRACT, or in any documents or other instruments pertaining to construction where these specifications govern, the intent and meaning shall be interpreted as follows:

**AASHTO.** *The American Association of State Highway and Transportation Officials, the successor association to AASHO.*

**Access road.** *The right-of-way, the roadway and all improvements constructed thereon connecting the airport to a public highway.*

**Advertisement.** *A public announcement, as required by local law, inviting bids for work to be performed and materials to be furnished.*

**Air operations area (AOA).** *For the purpose of these specifications, the term air operations area (AOA) shall mean any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operation area shall include such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiway, or apron.*

**Airport.** *Airport means an area of land or water which is used or intended to be used for the landing and takeoff of aircraft; an appurtenant area used or intended to be used for airport buildings or other airport facilities or rights of way; and airport buildings and facilities located in any of these areas, and includes a heliport.*

**ASTM International (ASTM).** *Formerly known as the American Society for Testing and Materials (ASTM).*

**Award.** *The Owner's notice to the successful bidder of the acceptance of the submitted bid.*

**Bidder.** *Any individual, partnership, firm, or corporation, acting directly or through a duly authorized representative, who submits a proposal for the work contemplated.*

**Building area.** *An area on the airport to be used, considered, or intended to be used for airport buildings or other airport facilities or rights-of-way together with all airport buildings and facilities located thereon.*

**Business day.** *All days other than Saturday, Sunday or federal or state holiday.*

**Calendar day.** *Every day shown on the calendar.*

**Change order.** *A written order to the Contractor covering changes in the plans, specifications, or proposal quantities and establishing the basis of payment and contract time adjustment, if any, for*

the work affected by such changes. The work, covered by a change order, must be within the scope of the contract.

**Contract.** The written agreement covering the work to be performed. The awarded contract shall include, but is not limited to: Advertisement, Contract Form, Proposal, Performance Bond, Payment Bond, any required insurance certificates, Specifications, Plans, and any addenda issued to bidders.

**Contract item (pay item).** A specific unit of work for which a price is provided in the contract.

**Contract time.** The number of calendar days or working days, stated in the proposal, allowed for completion of the contract, including authorized time extensions. If a calendar date of completion is stated in the proposal, in lieu of a number of calendar or working days, the contract shall be completed by that date.

**Contractor.** The individual, partnership, firm, or corporation primarily liable for the acceptable performance of the work contracted and for the payment of all legal debts pertaining to the work who acts directly or through lawful agents or employees to complete the contract work.

**Contractor's laboratory.** The Contractor's quality control organization in accordance with the Contractor Quality Control Program.

**Construction Safety and Phasing Plan (CSPP).** The overall plan for safety and phasing of a construction project developed by the airport operator, or developed by the airport operator's consultant and approved by the airport operator. It is included in the invitation for bids and becomes part of the project specifications.

**Drainage system.** The system of pipes, ditches, and structures by which surface or subsurface waters are collected and conducted from the airport area.

**Engineer.** The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for engineering of the contract work and acting directly or through an authorized representative.

**Equipment.** All machinery, together with the necessary supplies for upkeep and maintenance, and also all tools and apparatus necessary for the proper construction and acceptable completion of the work.

**Extra work.** An item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, but which is found by the Engineer to be necessary to complete the work within the intended scope of the contract as previously modified.

**FAA.** The Federal Aviation Administration of the U.S. Department of Transportation. When used to designate a person, FAA shall mean the Administrator or his or her duly authorized representative.

**Federal specifications.** The Federal Specifications and Standards, Commercial Item Descriptions, and supplements, amendments, and indices thereto are prepared and issued by the General Services Administration of the Federal Government.

**Force account.** Force account work is planning, engineering, or construction work done by the Sponsor's employees.

**Inspector.** An authorized representative of the County or Engineer assigned to make all necessary inspections and/or observation of tests of the work performed or being performed, or of the materials furnished or being furnished by the Contractor.

**Intention of terms.** Whenever, in these specifications or on the plans, the words “directed,” “required,” “permitted,” “ordered,” “designated,” “prescribed,” or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the Engineer is intended; and similarly, the words “approved,” “acceptable,” “satisfactory,” or words of like import, shall mean approved by, or acceptable to, or satisfactory to the Engineer, subject in each case to the final determination of the Owner.

Any reference to a specific requirement of a numbered paragraph of the contract specifications or a cited standard shall be interpreted to include all general requirements of the entire section, specification item, or cited standard that may be pertinent to such specific reference.

**Laboratory.** The official testing laboratories of the Owner or such other laboratories as may be designated by the Engineer. Also referred to as “Engineer’s Laboratory” or “quality assurance laboratory.”

**Lighting.** A system of fixtures providing or controlling the light sources used on or near the airport or within the airport buildings. The field lighting includes all luminous signals, markers, floodlights, and illuminating devices used on or near the airport or to aid in the operation of aircraft landing at, taking off from, or taxiing on the airport surface.

**Liquidated damages.** The amount prescribed in the Specifications, pursuant to the authority of the Government Code Section 53069.85, to be paid to the Owner or to be deducted from any payments due or to become due the Contractor for each day’s delay in completing the whole or any specified portion of the work beyond the time allowed in the Specifications.

**Lump sum.** A term used to describe a Contract item, which means the total payment or price of the item, including all labor, materials, equipment, incidentals, profit and overhead, and for which a schedule of values is to be provided upon request.

**Major and minor contract items.** A major contract item shall be any item that is listed in the proposal, the total cost of which is equal to or greater than 20% of the total amount of the award contract. All other items shall be considered minor contract items.

**Materials.** Any substance specified for use in the construction of the contract work.

**Notice to Proceed (NTP).** A written notice to the Contractor to begin the actual contract work on a previously agreed to date. If applicable, the Notice to Proceed shall state the date on which the contract time begins.

**Owner.** The term “Owner” shall mean the party of the first part or the contracting agency signatory to the contract. Where the term “Owner” is capitalized in this document, it shall mean airport Sponsor only.

**Passenger Facility Charge (PFC).** Per 14 CFR Part 158 and 49 USC § 40117, a PFC is a charge imposed by a public agency on passengers enplaned at a commercial service airport it controls.”

**Pavement.** The combined surface course, base course, and subbase course, if any, considered as a single unit.

**Payment bond.** The approved form of security furnished by the Contractor and his or her surety as a guaranty that the Contractor will pay in full all bills and accounts for materials and labor used in the construction of the work.

**Performance bond.** The approved form of security furnished by the Contractor and his or her surety as a guaranty that the Contractor will complete the work in accordance with the terms of the contract.

**Plans.** The official drawings or exact reproductions which show the location, character, dimensions and details of the airport and the work to be done and which are to be considered as a part of the contract, supplementary to the specifications.

**Project.** The agreed scope of work for accomplishing specific airport development with respect to a particular airport.

**Proposal.** The written offer of the bidder (when submitted on the approved proposal form) to perform the contemplated work and furnish the necessary materials in accordance with the provisions of the plans and specifications.

**Proposal guaranty.** The security furnished with a proposal to guarantee that the bidder will enter into a contract if his or her proposal is accepted by the Owner.

**Runway.** The area on the airport prepared for the landing and takeoff of aircraft.

**Specifications.** A part of the contract containing the written directions and requirements for completing the contract work. Standards for specifying materials or testing which are cited in the contract specifications by reference shall have the same force and effect as if included in the contract physically.

**Sponsor.** A Sponsor is defined in 49 USC § 47102(24) as a public agency that submits to the State of California, Department of Transportation, a grant; or a private Owner of a public-use airport that submits an application for a grant for the airport.

**Structures.** Airport facilities such as bridges; culverts; catch basins, inlets, retaining walls, cribbing; storm and sanitary sewer lines; water lines; underdrains; electrical ducts, manholes, handholes, lighting fixtures and bases; transformers; flexible and rigid pavements; navigational aids; buildings; vaults; and, other manmade features of the airport that may be encountered in the work and not otherwise classified herein.

**Subgrade.** The soil that forms the pavement foundation.

**Superintendent.** The Contractor's executive representative who is present on the work during progress, authorized to receive and fulfill instructions from the Engineer, and who shall supervise and direct the construction.

**Supplemental agreement.** A written agreement between the Contractor and the Owner covering (1) work that would increase or decrease the total amount of the awarded contract, or any major contract item, by more than 25%, such increased or decreased work being within the scope of the originally awarded contract; or (2) work that is not within the scope of the originally awarded contract.

**Surety.** The corporation, partnership, or individual, other than the Contractor, executing payment or performance bonds that are furnished to the Owner by the Contractor.

**Taxiway.** For the purpose of this document, the term taxiway means the portion of the air operations area of an airport that has been designated by competent airport authority for movement of aircraft to and from the airport's runways, aircraft parking areas, and terminal areas.

**Work.** The furnishing of all labor, materials, tools, equipment, and incidentals necessary or convenient to the Contractor's performance of all duties and obligations imposed by the contract, plans, and specifications.

**Working day.** A working day shall be any day other than a legal holiday, Saturday, or Sunday on which the normal working forces of the Contractor may proceed with regular work for at least six (6) hours toward completion of the contract. When work is suspended for causes beyond the

*Contractor's control, it will not be counted as a working day. Saturdays, Sundays and holidays on which the Contractor's forces engage in regular work will be considered as working days.*

## SECTION 2 – SCOPE AND CONTROL OF THE WORK

### 2.1 AWARD AND EXECUTION OF CONTRACT

Within ten business days after the date of the COUNTY'S notice of award, the CONTRACTOR shall execute and return the following contract documents to the COUNTY:

- Contract Agreement
- Faithful Performance Bond
- Bid Bond
- Payment Bond
- Public Liability and Property Damage Insurance Certificate and Endorsements
- Workers' Compensation Insurance Certificate
- Non collusion Affidavit
- Tax identification information
- Supplemental Information (Corporation evidence)
- Insurance
- Disabled Veteran Business Enterprise (DBVBE)
- Safety Plan Compliance Document

Failure to comply with the above will result in annulment of the award and forfeiture of the Bid Proposal Guarantee.

The Contract Agreement shall not be considered binding upon the COUNTY until executed by the authorized COUNTY officials.

A corporation to which an award is made is required, before the Contract Agreement is executed by the COUNTY, to furnish evidence of its corporate existence, of its right to enter into contracts in the State of California, and that the officers signing the contract and bonds for the corporation have the authority to do so. (This is the Supplemental Information form).

### 2.2 PLANS AND SPECIFICATIONS

2.2.1 General. The CONTRACTOR shall maintain a control set of Plans and Specifications on the project site at all times. All final locations determined in the field, and any deviations from the Plans and Specifications, shall be marked in red on this control set to show the "as-built" conditions. Upon completion of all work, the CONTRACTOR shall return the control set to the COUNTY. All data from the Contractor shall also be furnished in electronic format. Final payment will not be made until this requirement is met.

### 2.3 AUTHORITY OF COUNTY'S REPRESENTATIVE (ENGINEER).

As authorized by the COUNTY, the Engineer shall decide any and all questions which may arise as to the quality and acceptability of materials furnished, work performed, and as to the manner of performance and rate of progress of the work. The Engineer shall decide all questions that may arise as to the interpretation of the specifications or plans relating to the work. The Engineer shall determine the amount and quality of the several kinds of work performed and materials furnished which are to be paid for the under contract.

The Engineer may observe, at his/her own discretion the Contractor's methods, plant, equipment and appurtenances and may order the work stopped when necessary to prevent its improper execution; may reject any work and materials which in his opinion does not conform to the requirements of the Contract; shall decide all questions which may arise as to the obligation of the

Contractor to do any particular work or to furnish any particular materials or as to the reasonable value of any additional work or materials required by the Engineer, or as to the deductions to be made from the Contract price for the work specified herein by reason of any work or materials directed by the Engineer to be omitted. All instructions, rulings and decision of the Engineer shall be made promptly and shall be in writing if so requested by the Contractor, and all such instructions, rulings, and decisions shall be final and binding.

In carrying out any of the above provisions or in exercising any power or authority granted to him by the Contract Documents, there shall be no liability upon the Engineer or his authorized assistants, either personally or as an official of the COUNTY, it being understood that in such matters the Engineer acts as an agent and representative of the COUNTY.

## 2.4 ORDER OF PRECEDENCE OF CONTRACT DOCUMENTS

The contract, plans, specifications, and all referenced standards cited are essential parts of the contract requirements. A requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In case of discrepancy, the following is the order of precedence of governing documents:

### ORDER OF PRECEDENCE

1. Permits issued by jurisdictional regulatory agencies
2. Change Orders
3. Contract/Agreement
4. Addenda
5. Bid/proposal
6. Special Provisions
7. Technical Specifications
8. Project Plans
9. General Provisions, State and Local
10. Standard Plans
11. Standard Specifications
12. Referenced Specifications

## SECTION 3 - CONTROL OF MATERIALS

### 3.1 MATERIALS AND WORKMANSHIP

3.1.1 Test of Materials. Except as elsewhere specified, the COUNTY will bear the cost of Quality Assurance testing material and/or workmanship that meet or exceed the requirements indicated in the Standard Specifications and the Special Provisions. The cost of all other tests, including the retesting of material or workmanship that fails to pass the first test, shall be borne by the CONTRACTOR.

3.1.2 Trade Names or Equals. Product submittals to be considered as equals must be submitted for review and approval within seven (7) business days of award of bid to be considered for substitution.

### 3.2 SOURCE OF SUPPLY AND QUALITY REQUIREMENTS.

*The materials used in the work shall conform to the requirements of the contract, plans, and specifications.*

*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.*

### 3.3 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, quality assurance tests in accordance with the cited standard methods of ASTM, American Association of State Highway and Transportation Officials (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 quality assurance 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 or her request. Unless otherwise designated, samples for quality assurance 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 their request after review and approval of the Engineer.*

*The Contractor shall employ a testing organization to perform all Contractor required Quality Control 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.*

*All test data from the Contractor shall be furnished in electronic format.*

### 3.4 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:*



- a. *Conformance to the specified performance, testing, quality or dimensional requirements; and,*
- b. *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, the Contractor shall furnish the manufacturer's certificates of compliance as hereinbefore 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.*

### 3.5 PLANT INSPECTION.

The Engineer or his or her 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 acceptance of the material or assembly.

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

- a. The Engineer shall have the cooperation and assistance of the Contractor and the producer with whom the Engineer has contracted for materials.
- b. 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.
- c. 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 that 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 only material which, when retested, does not meet the requirements of the contract, plans, or specifications.

### 3.6 UNACCEPTABLE MATERIALS.

Any material or assembly that does not conform to the requirements of the contract, plans, or 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.

Rejected material or assembly, the defects of which have been corrected by the Contractor, shall not be returned to the site of the work until such time as the Engineer has approved its use in the work.

### 3.7 OWNER FURNISHED MATERIALS.

The Contractor shall furnish all materials required to complete the work, except those specified, 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 that 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.

### 3.8 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:*

- a. 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.*
- b. 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 not less than 10 days after award of the Contract.*

### 3.9 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.*

### 3.10 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.*

### 3.11 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.*

## SECTION 4 - UTILITIES

**NOTIFICATION OF UNDERGROUND SERVICE ALERT (USA):** At least five (5) business days prior to starting work, the CONTRACTOR shall contact Underground Service Alert at 1-800-422-4133 (811). CONTRACTOR shall submit to Underground Service Alert a complete list of Thomas Brothers Map Book Pages and Grids encompassing the area of work. CONTRACTOR shall notify the Underground Service Alert of any changes as they occur to the area of work.

## SECTION 5 - PROSECUTION, PROGRESS, AND ACCEPTANCE OF WORK

### 5.1 CONSTRUCTION, PROGRESS, AND ACCEPTANCE OF WORK

The CONTRACTOR's proposed Construction Schedule shall be submitted to the COUNTY within ten (10) business days after the date of the COUNTY'S execution of the Contract Agreement. The schedule shall be supported by written statements from each supplier of materials or equipment indicating that all orders have been placed and acknowledged, and setting forth the dates that each item will be delivered.

Prior to issuing the Notice to Proceed with Work, the COUNTY will schedule a preconstruction meeting with the CONTRACTOR to review the proposed Construction Schedule and delivery dates, arrange utility coordination, discuss construction methods, and clarify inspection procedures.

The CONTRACTOR shall submit periodic Progress Reports to the Project Manager by the tenth day of each month. The report shall include an updated Construction Schedule. Any deviations from the original schedule shall be explained. Progress payment will be withheld pending receipt of any outstanding reports.

### 5.2 TIME OF COMPLETION

5.2.1 General. The time for completion shall be as noted in the Instructions to Bidders and Division IV, A-100 Operational Safety for Airport Construction.

5.2.2 Working Days. The CONTRACTOR's activities shall be confined to the hours of 8:00 a.m. and 5:00 p.m. Monday through Friday, excluding holidays, except where noted in the General Specifications. Deviation from these hours will not be permitted without the prior consent of the COUNTY, except in emergencies involving immediate hazard to persons or property. The service fees will be charged against the CONTRACTOR. The service fees will be charged at the actual cost to the COUNTY plus overhead. The service fees will be deducted from any amounts due the CONTRACTOR.

### 5.3 LIQUIDATED DAMAGES

For each consecutive calendar day in excess of the time specified for completion of the work, the CONTRACTOR shall pay to the COUNTY, or have withheld from monies due it, the sum of \$1,500. Execution of the contract shall constitute agreement by the COUNTY and CONTRACTOR that \$1,500 per day is a minimum value of the costs and actual damages caused by failure of the CONTRACTOR to complete the work within the allotted time, that such sum is liquidated damages and shall not be construed as a penalty, and that such sum may be deducted from payments due to the CONTRACTOR if such delay occurs. The parties agree that liquidated damages are appropriate because of the difficulty if not impossibility of determining the amount of any damages for delay of the project. (See Division IV, A-100 Operational Safety for Airport Construction for further details on Liquidated Damages.)

## SECTION 6 — MEASUREMENT AND PAYMENT

### 6.1 MEASUREMENT AND PAYMENT

- A.** Measurement. All work completed under the contract will be measured by the Engineer, or his or her 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 of work performed under the contract will be those methods generally recognized as conforming to good engineering practice.

**B. Progress Payments.**

1. The Agency shall pay the Contractor the price as provided in this Contract.
2. The Agency shall make progress payments monthly as the Work proceeds, on estimates approved by the Agency. The Contractor shall furnish a breakdown of the total contract price, in a format provided by the Agency, showing the amount included therein for each principal category of the work, in such detail as requested, to provide a basis for determining progress payments.
3. Contractor shall submit to the Agency vouchers, schedule activities, or other satisfactory proof of the value of any work for which he claims payment on such account, and receipts showing that progress payments have been duly made on such contracts, and for materials furnished.
4. In the preparation of estimates, the Agency may authorize 75% of the value of material delivered and satisfactorily stored on the site, and preparatory work done to be taken into consideration for major equipment if:
  - a. Consideration is specifically authorized by this Contract; and
  - b. The Contractor furnishes certified receipt that it has acquired title and paid invoices for such material and that the material will be used to perform this Contract.
5. On the 25th of each month the Contractor will submit his request for payment. Prior to that submittal the Agency will review the requested percentage of completion for each activity. The payment request will be in the format as provided by the Agency and will refer to the schedule.
6. Upon receipt of a payment request, the Agency shall:
  - a. Review that request as soon as practicable after receipt for the purpose of determining that the payment request is a proper payment request; and
  - b. Any payment request determined not to be a proper request suitable for payment shall be returned to the Contractor as soon as practicable, but not later than seven (7) calendar days after receipt. The returned request for payment shall be accompanied by a document setting forth in writing the reasons why the payment request is not proper.
7. Any progress payment which is undisputed and properly submitted and remains unpaid for thirty (30) calendar days after receipt by Agency shall accrue interest to the Contractor equivalent to the legal rate set forth in subdivision (a) of Section 685.010 of the California Code of Civil Procedure. The number of days available to the Agency to make a payment without incurring interest pursuant to this section shall be reduced by the number of days by which the Agency exceeds the seven-day return requirement set forth in 20.1.6 above.
8. In making these progress payments, there shall be retained ten percent (10%) from the amount of each progress payment until the work is 50% complete. After the 50% completion point, if satisfactory progress is being made and at the sole discretion of the Agency, the retention may be reduced to a minimum of 5% of the contract.
9. Except as otherwise prohibited by law, the Contractor may elect to receive all payments due under the contract pursuant to this section without any retention, by posting securities in accordance with Public Contract Code Section 22300.
10. Contractor and each subcontractor shall pay each of its employees engaged in work under this Contract in full (less deductions made mandatory by law) in accordance with California law.

11. The Agency may withhold (in excess of retentions) or, on account of subsequently discovered evidence, nullify the whole or a part of any certificate to such extent as may be necessary to protect the Agency from loss on account of:
  - a. Defective work not remedied.
  - b. Claims filed or reasonable evidence indicating probable filing of claims.
  - c. Failure of the Contractor to make payments properly to subcontractors or for material or labor.
  - d. Damage to another Contractor.
  - e. Delays in progress toward completion of the work, with the stipulated amount of liquidated damages being withheld for each day of delay for which no extension is granted.
  - f. Default of the Contractor in the performance of the terms of the Contract.
12. Should stop notices be filed with the Agency, the Agency shall withhold the amount required plus 25% from certificates until such claims shall have been resolved pursuant to applicable law. California Civil Code Section 3179 et seq.
13. At the election of the Agency, Contractor shall provide, within ten (10) calendar days of receipt of each progress payment, unconditional waivers and release of lien rights, signed by Contractor and each of its subcontractors and materials suppliers, in the form established therefore by Section 3262 of the Civil Code.
14. All material and work covered by progress payments made shall, at the time of payment, become the sole property of the Agency, but this shall not be construed as:
  - a. An acceptance of any work not in accordance with the Contract Documents; or
  - b. Waiving the right of the Agency to require the fulfillment of all of the terms of the contract.

**C. Final Payment.**

1. General.
  - a. The Agency shall pay the amount due the Contractor under this Contract after:
    - 1) The Acceptance of all work and Notice of Completion per the terms of this Contract
    - 2) Presentation of a properly executed voucher
    - 3) Release of all liens and Stop Notices
    - 4) Presentation of release of all claims against the Agency arising by virtue of this Contract, other than claims and disputes in stated amounts that the Contractor has specifically excepted from the operation of the release.
  - b. The Contractor may, if any subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Agency, to indemnify him against any lien.

**D. Final Certificate for Payment.**

1. When the work is ready for acceptance by the Agency, Agency will certify and submit to the Board of Directors a Notice of Completion. Upon approval of the Notice of Completion, a copy will be sent to the Contractor.
2. Notice of Completion will be recorded by the Agency upon completion and Acceptance of the Work. Providing no stop notices have been filed, thirty-five (35) calendar days after filing of such Notice of Completion, payment due under the contract will become due to the Contractor and the Agency shall so certify authorizing the final payment.

**E. Final Payment.**

1. After Acceptance of Work, the Agency will submit to Contractor a statement of the sum due Contractor under this contract, together with Agency payment in the amount thereof. Said statement shall take into account the contract price, as adjusted by any change orders; amounts already paid; sums to be withheld for incomplete work; liquidated damages; and for any other cause under the Contract.
2. The Contractor shall, from the effective date of Acceptance until the expiration of four years after final settlement under this Contract, preserve and make available to the Agency, all its books, records, documents, and other evidence bearing on the costs and expenses of the Contractor under this Contract.

END OF DIVISION III

**DIVISION IV**  
**Technical Specifications**

## Item A-100, Miscellaneous Provisions for Airport Safety and Construction

**100-1 Overview.** This Section 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. Unless otherwise noted, all costs associated with related work shall be included in the Contract pay item for Airfield Safety and Traffic Control.

**100-2 Construction Safety and Phasing Plan (CSPP).** The Contractor shall comply with the Project specific CSPP included as *Appendix 1* at the end of the Project Specifications. Included as part of the requirements of the CSPP is the Safety Plan Compliance Document (SPCD) that must be completed, by the Contractor, and submitted to the County for approval before Notice to Proceed with Construction is given.

**100-3 Construction Schedule and Progress Schedule.** A construction schedule shall be submitted to the County by the Contractor within 10 working days after the award of contract. The schedule shall be presented at the preconstruction meeting. It shall be updated and presented at each weekly construction meeting. A County-approved schedule will be required prior to issuing a Notice to Proceed.

Schedule shall be a Critical Path Method type. Schedule shall indicate complete sequence of each construction category, indicating a time bar for each major category or unit of work to be performed. Work shall be properly sequenced and indicate work being fully completed within the scheduled time of completion or substantial completion.

Schedule shall be coordinated with all other Contractors, subcontractors and material suppliers prior to submission. Contractor shall automatically update schedule for each weekly construction meeting or whenever there is a significant change in progress, whether in a particular phase or total job progress.

Progress milestones schedule shall incorporate, submittals, product data, and sample submissions. Schedule shall indicate preparation time, approval time, resubmissions, fabrications, delivery dates and installation time.

**100-4 Lines and Grades.** The Contractor shall provide construction and layout staking for the County and COUNTY to review and confirm prior to work being started. The County will be given 48 hours' notice of pavement marking layout so it may be checked.

**100-5 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. Documentation of Record Drawings shall be included in other items of work and no separate payment will be made.

**100-6 Material Testing and Retesting.** All Quality Control shall be performed by the Contractor; all Quality Acceptance Testing will be performed by the County as necessary. The Quality Control Testing shall include but is not limited to:



1. Materials testing for aggregates and pavements prior to acceptance testing of cores by County. **The Contractor is allotted one acceptance test per area per material per lot.** In the event the acceptance tests do not pass and the County is required to retest the area, the cost for each retest shall be borne by the Contractor.
2. All Hot Mix Asphalt and Portland cement concrete mix designs and other conformance testing required in the technical specifications.
3. All prequalification testing required by the technical specifications.

**100-7 Time Limitations.** The time of completion for the Base Bid of this Project is 35 working days. Should the time schedule not be met for either Mobilization phase or Construction phase as stated below, liquidated damages will be assessed. Contract time is divided as follows:

- A. Mobilization.** Notice to Proceed with Mobilization shall be given shortly after award of Contract. All work included in Mobilization shall be completed within 20 working days. No work shall be conducted that in any way restricts Airport operations.
- B. Construction.** Notice to Proceed with construction shall be issued at the COUNTY's discretion after completion of Mobilization. All work included in the Construction Element shall be completed within 15 working days. The airport shall be closed to aircraft for the duration of the construction.

**100-8 Liquidated Damages.** If the approved time limitation for any phase of work not be met, liquidated damages of \$1,500.00 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.

**100-9 Barricades.** The Contractor shall supply traffic delineators and signage as necessary to control construction traffic on airport property and at the airport entrance gate. The COUNTY will provide portable, lighted runway closure crosses which will need to be mobilized by the CONTRACTOR to the site from the COUNTY's yard. The lighted runway closure crosses shall be returned to the COUNTY undamaged and in good working order.

**100-10 Radio Communication with Airport Traffic.** All traffic on the Airport, including aircraft and motor vehicles, are uncontrolled. The Contractor will be required to monitor the common traffic frequency during construction hours to prevent aircraft approaching the airport from landing during construction. Two-way radio communication shall be monitored at all times when working or traveling within the Airport perimeter to communicate closure warnings to such aircraft. The Contractor shall have on-site at all times an Air Band VHF Transceiver, which receives and transmits on a frequency of 122.900.

**100-11 Access and Security.**

- A. Contractor Access.** Contractor access to the work area shall be via the access route indicated on the Plans. Haul routes on Airport property shall be approved by the County. All access routes and haul roads shall be kept clean and free of debris. Dust control shall be maintained. Where haul routes cross active taxiways or aprons, temporary stop signs shall be provided by the Contractor as shown on the Plans.
- B. Access Security 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.

**100-12 Work Hour Limitations.** With the exception of the approved night work, the Airport's normal work hours are from 8:00 a.m. to 5:00 p.m., Pacific Time, Monday through Friday, excluding holidays. All work performed outside of this schedule shall be coordinated and approved in advance by the County. The Contractor will be charged for work performed outside of this schedule that requires inspection or observation by the County staff. The rate for observation personnel is \$125.00 per hour including expenses. The rate for Inspection Engineer and Material Testing is \$185.00 per hour.

**100-13 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.

**100-14 Storm Water Pollution Prevention Plan (SWPPP).** A SWPPP is not required for this Project.

#### **METHOD OF MEASUREMENT**

**100-15** Airfield Safety and Traffic Control will be measured as a lump sum item.

#### **BASIS OF PAYMENT**

**100-16** 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, CSPP compliance, SPCD preparation and compliance, and incidentals necessary to complete the work as specified and requirements shown on the Plans.

Payment will be made under:

*Item A-100 Airfield Safety and Traffic Control – per lump sum*

**END OF ITEM A-100**

## Item A-105 Mobilization

### DESCRIPTION

**105-1 General.** This item shall consist of work and operations, but is not limited to, work and operations necessary for the movement of personnel, equipment, material and supplies to and from the project site for work on the project except as provided in the contract as separate pay items.

**105-1.1 Posted notices.** Prior to commencement of construction activities the Contractor must post the following documents in a prominent and accessible place where they may be easily viewed by all employees of the prime Contractor and by all employees of subcontractors engaged by the prime Contractor: Equal Employment Opportunity (EEO) Poster "Equal Employment Opportunity is the Law" in accordance with the Office of Federal Contract Compliance Programs Executive Order 11246, as amended; Davis Bacon Wage Poster (WH 1321) - DOL "Notice to All Employees" Poster; and Applicable Davis-Bacon Wage Rate Determination. These notices must remain posted until final acceptance of the work by the Owner.

**105-1.2 Mobilization Phase.** The Mobilization phase shall begin within five working days of the date of the Notice to Proceed for Mobilization.

**105-1.3 Submittals.** All materials and equipment submittals are to be submitted to the County for review during the Mobilization Phase. Any material ordered prior to completion of the review for that material is at the Contractor's risk.

The data submitted shall be sufficient, in the opinion of the County, to determine the compliance with the plans and specifications. Submittals consisting of marked catalog sheets or Shop Drawings shall be provided in a clear, precise, thorough, and legible manner. Original catalog sheets are preferred, but good quality, legible photocopies are also acceptable. Submitted documents shall boldly and clearly mark, using arrows or circles with highlighting, pertinent products or models applicable to this project. Additionally, all optional equipment shall be similarly identified. Any deviations or substitutions from the Specifications shall be identified, in writing, at the time of the submittal.

The Contractor shall submit one hardcopy and one electronic copy, in Portable Document Format (pdf), to the County for review. The County reserves the right to reject any and all materials, equipment, or procedures which, in the County's opinion, do not meet the system design and the standards and codes specified.

The Contractor is solely responsible for delays in the Project resulting directly or indirectly from late submissions or resubmission of submittals. Any submittals received after the completion of the Mobilization Phase may be subject to a charge of \$150 per hour of review.

### METHOD OF MEASUREMENT

**105-2.1 Measurement.** Mobilization shall be measured by lump sum.

### BASIS OF PAYMENT

**105-3.1 Payment.** Based upon the contract lump sum price for "Mobilization" partial payments will be allowed as follows:

- a. With first pay request, 25%.

b. When 10% or more of the original contract amount, not including Mobilization, is earned, an additional 25%.

c. When 25% or more of the original contract amount, not including Mobilization, is earned, an additional 40%.

d. After Final Inspection, Staging area clean-up and delivery of all Project Closeout materials as required by 90-11, the final 10%.

Payment will be made under:

*Item A-105      Mobilization – per lump sum*

**END OF SECTION A-105**

## Item P-101 Surface Preparation

### DESCRIPTION

**101-1.1** This item shall consist of preparation of existing pavement surfaces for overlay, surface treatments, asphalt pavement sawcutting, and other miscellaneous items. The work shall be accomplished in accordance with these specifications and the applicable drawings.

### EQUIPMENT

**101-2.1** All equipment shall be specified here and in the following paragraphs or approved by the Engineer. The equipment shall not cause damage to the pavement to remain in place.

### CONSTRUCTION

#### 101-3.1 Asphalt Pavement Sawcutting.

a. **Concrete pavement.** Not used.

b. **Asphalt concrete pavement.** Asphalt concrete pavement to be sawcut shall be cut only to the depth required by the PLANS and details. Any residue resulting from pavement sawcutting operations shall be cleaned up and disposed off-site in an appropriate manner.

**101-3.2 Preparation of joints and cracks.** Remove all vegetation and debris from cracks to a minimum depth of 1 inch. If extensive vegetation exists treat the specific area with a concentrated solution of a water-based herbicide approved by the Engineer. Fill all cracks, ignoring hairline cracks (< 1/4 inch wide) with a crack sealant per ASTM D6690. Wider cracks (over 1-1/2 inch wide), along with soft or sunken spots, indicate that the pavement or the pavement base should be repaired or replaced as stated below. Any excess joint or crack sealer on the surface of the pavement shall also be removed from the pavement surface.

Cracks and joints may be filled with a mixture of emulsified asphalt and aggregate. The aggregate shall consist of limestone, volcanic ash, sand, or other material that will cure to form a hard substance. The combined gradation shall be as shown in the following table.

Gradation

Sieve Size	Percent Passing
No. 4	100
No. 8	90-100
No. 16	65-90
No. 30	40-60
No. 50	25-42
No. 100	15-30
No. 200	10-20

Up to 3% cement can be added to accelerate the set time. The mixture shall not contain more than 20% natural sand without approval in writing from the Engineer.

The proportions of asphalt emulsion and aggregate shall be determined in the field and may be varied to facilitate construction requirements. Normally, these proportions will be approximately one part asphalt emulsion to five parts aggregate by volume. The material shall be poured or placed into the joints or cracks

and compacted to form a voidless mass. The joint or crack shall be filled within 0 to 1/8 inches of the surface. Any material spilled outside the width of the joint shall be removed from the pavement surface prior to constructing the overlay. Where concrete overlays are to be constructed, only the excess joint material on the pavement surface and vegetation in the joints need to be removed.

**101-3.3 Removal of paint and rubber.** All paint and rubber over 1 foot wide that will affect the bond of the new overlay shall be removed from the surface of the existing pavement. Chemicals, high-pressure water, heater scarifier (asphaltic concrete only), cold milling, or sandblasting may be used. Any methods used shall not cause major damage to the pavement. Major damage is defined as changing the properties of the pavement or removing pavement over 1/8 inch deep. If chemicals are used, they shall comply with the state's environmental protection regulations. No material shall be deposited on the runway shoulders. All wastes shall be disposed of in areas indicated in this specification or shown on the plans.

**101-3.4 Cold milling.** Milling shall be performed with a power-operated milling machine or grinder, capable of producing a finished surface that provides a good bond to the new overlay. The milling machine or grinder shall operate without tearing or gouging the under laying surface. The milling machine or grinder shall be equipped with automatic grade and slope controls. All millings shall be removed and disposed off Airport property, unless otherwise specified. If the Contractor mills or grinds deeper or wider than the plans specify, the Contractor shall replace the material that was removed with new material at no additional cost to the Owner.

**a. Patching.** The milling machine shall be capable of cutting a vertical edge without chipping or spalling the edges of the remaining pavement and it shall have a positive method of controlling the depth of cut. The Engineer shall layout the area to be milled with a straightedge in increments of 1 foot (30 cm) 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 milling 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 milling machine shall have a minimum width of seven (7) feet and it shall be equipped with electronic grade control devices 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 have the ability to remove the millings or cuttings from the pavement and load them into a truck.

**c. Clean-up.** The Contractor shall sweep the milled surface daily and immediately after the milling until all residual aggregate and fines are removed from the pavement surface. Prior to paving, the Contractor shall wet down the milled pavement and thoroughly sweep and/or blow the surface to remove any remaining aggregate or fines.

**101-3.5 Preparation of asphalt pavement surfaces.** Existing asphalt pavements indicated to be treated with a surface treatment shall be prepared as follows:

**a.** Patch asphalt pavement surfaces that have been softened by petroleum derivatives or have failed due to any other cause. Remove damaged pavement to the full depth of the damage and replace with new asphalt concrete similar to that of the existing pavement in accordance with paragraph 101-3.4.

**b.** Repair joints and cracks in accordance with paragraph 101-3.2.

**c.** Remove oil or grease that has not penetrated the asphalt pavement by scraping or by scrubbing with a detergent, then wash thoroughly with clean water. After cleaning, treat these areas with an oil spot primer.

d. Clean pavement surface immediately prior to placing the surface treatment by sweeping, flushing well with water leaving no standing water, or a combination of both, so that it is free of dust, dirt, grease, vegetation, oil or any type of objectionable surface film.

**101-3.6 Maintenance.** The Contractor shall perform all maintenance work necessary to keep the pavement in a satisfactory condition until the full section is complete and accepted by the Engineer. The surface shall be kept clean and free from foreign material. The pavement shall be properly drained at all times. If cleaning is necessary or if the pavement becomes disturbed, any work repairs necessary shall be performed at the Contractor's expense.

**101-3.7 Preparation of Joints in Rigid Pavement.** Not used.

**101-3.8 Preparation of Cracks in Flexible Pavement.** Not used.

**101-3.8.1 Preparation of Crack.** Widen crack with either a router or random crack saw by removing a minimum of 1/16 inch from each side of crack. Immediately before sealing, joints will be blown out with a hot air lance combined with oil and water-free compressed air.

**101-3.8.2 Removal of Existing Sealant.** Existing sealants will be removed by routing or random crack saw. Following routing or sawing any remaining debris will be removed by use of a hot lance combined with oil and water-free compressed air.

#### **METHOD OF MEASUREMENT**

**101-4.1 Asphalt pavement sawcutting.** The unit of measurement for asphalt pavement sawcutting shall be the number of lineal feet of sawcutting performed as required by the PLANS regardless of the sawcut depth. Any pavement sawcutting outside the limits of required by the PLANS caused by negligence on the part of the Contractor shall not be included in the measurement for payment.

**101-4.2 Joint and crack repair.** The unit of measurement for joint and crack repair shall be the linear foot of joint.

**101-4.3 Paint and rubber removal.** The unit of measurement for paint and rubber removal shall be the square foot.

**101-4.4 Cold milling.** The unit of measure for cold milling shall be 1 inches of milling per square yard. The location and average depth of the cold milling shall be determined and agreed to by the Engineer and the Contractor prior to beginning the work. If the initial cut doesn't correct the condition and surface correction is required, the Contractor shall re-mill the area and will be paid only once for the total depth of milling.

#### **BASIS OF PAYMENT**

**101-5.1 Payment.** Payment shall be made at contract unit price for the unit of measurement as specified above. 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.

Payment will be made under:

*Item P 101-5.1 Asphalt Pavement Sawcutting – per linear foot*

*Item P 101-5.2 Joint and Crack Repair – per linear foot*

*Item P 101-5.3 Paint and Rubber Removal – per square foot*

*Item P-101-5.4 Cold Milling – per square yard*

#### **MATERIAL REQUIREMENTS**

ASTM D6690

Standard Specification for Joint And Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements

**END OF ITEM P-101**



## Item P-603 Bituminous Tack Coat

### DESCRIPTION

**603-1.1** This item shall consist of preparing and treating a bituminous or concrete surface with bituminous material in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

### MATERIALS

**603-2.1 Bituminous materials.** The bituminous material shall be an emulsified asphalt indicated in ASTM D3628 as a bituminous application for tack coat appropriate to local conditions or as designated by the Engineer.

### CONSTRUCTION METHODS

**603-3.1 Weather limitations.** The tack coat shall be applied only when the existing surface is dry and the atmospheric temperature is 50°F (10°C) or above; the temperature has not been below 35°F (2°C) for the 12 hours prior to application; and when the weather is not foggy or rainy. The temperature requirements may be waived when directed by the Engineer.

**603-3.2 Equipment.** The Contractor shall provide equipment for heating and applying the bituminous material.

Provide a distributor with pneumatic tires of such size and number that the load produced on the base surface does not exceed 65.0 psi (4.5 kg/sq cm) of tire width to prevent rutting, shoving or otherwise damaging the base, surface or other layers in the pavement structure. Design and equip the distributor to spray the bituminous material in a uniform coverage at the specified temperature, at readily determined and controlled rates from 0.05 to 2.0 gallons per square yard (0.23 to 9.05 L/square meter), with a pressure range of 25 to 75 psi (172.4 to 517.1 kPa) and with an allowable variation from the specified rate of not more than ±5%, and at variable widths. Include with the distributor equipment a separate power unit for the bitumen pump, full-circulation spray bars, tachometer, pressure gauges, volume-measuring devices, adequate heaters for heating of materials to the proper application temperature, a thermometer for reading the temperature of tank contents, and a hand hose attachment suitable for applying bituminous material manually to areas inaccessible to the distributor. Equip the distributor to circulate and agitate the bituminous material during the heating process. If the distributor is not equipped with an operable quick shutoff valve, the tack operations shall be started and stopped on building paper. The Contractor shall remove blotting sand prior to asphalt concrete lay down operations at no additional expense to the Owner.

A power broom and/or power blower suitable for cleaning the surfaces to which the bituminous tack coat is to be applied shall be provided.

**603-3.3 Application of bituminous material.** Immediately before applying the tack coat, the full width of surface to be treated shall be swept with a power broom and/or power blower to remove all loose dirt and other objectionable material.

Emulsified asphalt shall be diluted by the addition of water when directed by the Engineer and shall be applied a sufficient time in advance of the paver to ensure that all water has evaporated before the overlying mixture is placed on the tacked surface.

The bituminous material including vehicle shall be uniformly applied with a bituminous distributor at the rate of 0.05 to 0.10 gallons per square yard (0.20 to 0.50 liters per square meter) depending on the condition of

the existing surface. The type of bituminous material and application rate shall be approved by the Engineer prior to application.

After application of the tack coat, the surface shall be allowed to cure without being disturbed for the period of time necessary to permit drying and setting of the tack coat. This period shall be determined by the Engineer. The Contractor shall protect the tack coat and maintain the surface until the next course has been placed.

**603-3.4 Bituminous material Contractor's responsibility.** The Contractor shall provide a statement of source and character of the proposed bituminous material which must be submitted and approved by the Engineer before any shipment of bituminous materials to the project.

The Contractor shall furnish the vendor's certified test reports for each carload, or equivalent, of bituminous material shipped to the project. The tests reports shall be provided to and approved by the Engineer before the bituminous material is applied. If the bituminous material does not meet the specifications, it shall be replaced at the Contractor's expense. Furnishing the vendor's certified test report for the bituminous material shall not be interpreted as a basis for final acceptance.

**603-3.5 Freight and weigh bills** The Contractor shall submit waybills and delivery tickets, during progress of the work. Before the final statement is allowed, file with the Engineer certified waybills and certified delivery tickets for all bituminous materials used in the construction of the pavement covered by the contract. Do not remove bituminous material from storage until the initial outage and temperature measurements have been taken. The delivery or storage units will not be released until the final outage has been taken.

#### **METHOD OF MEASUREMENT**

**603-4.1** The bituminous material for tack coat shall be measured by the ton. Volume shall be corrected to the volume at 60°F (16°C) in accordance with ASTM D1250. The bituminous material paid for will be the measured quantities used in the accepted work, provided that the measured quantities are not 10% over the specified application rate. Any amount of bituminous material more than 10% over the specified application rate for each application will be deducted from the measured quantities, except for irregular areas where hand spraying of the bituminous material is necessary. Water added to emulsified asphalt will not be measured for payment.

#### **BASIS OF PAYMENT**

**603.5-1** Payment shall be made at the contract unit price per ton of bituminous material. This price shall be full compensation for furnishing all materials, for all preparation, delivery, and application of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

*Item P-603-5.1 Bituminous Tack Coat – per ton*

#### **MATERIAL REQUIREMENTS**

ASTM D633	Standard Volume Correction Table for Road Tar
ASTM D977	Standard Specification for Emulsified Asphalt
ASTM D1250	Standard Guide for Use of the Petroleum Measurement Tables

ASTM D2028	Standard Specification for Cutback Asphalt (Rapid-Curing Type)
ASTM D2397	Standard Specification for Cationic Emulsified Asphalt
ASTM D3628	Standard Practice for Selection and Use of Emulsified Asphalts

**END ITEM P-603**

## **39 ASPHALT CONCRETE**

### **39-1 GENERAL**

#### **39-1.01 GENERAL**

Section 39 includes specifications for performing asphalt concrete work.

#### **39-1.02 MATERIALS**

Not Used

#### **39-1.03 CONSTRUCTION**

Not Used

#### **39-1.04 PAYMENT**

Not Used

### **39-2 HOT MIX ASPHALT**

#### **39-2.01 GENERAL**

##### **39-2.01A General**

##### **39-2.01A(1) Summary**

Section 39-2.01 includes general specifications for producing and placing hot mix asphalt.

HMA type to be used for this project is:

1. Type A HMA

If the use of a WMA technology is allowed or required by a special provision, the WMA technology to be used must be on the Authorized Material List for approved technologies.

Wherever reference is made to the following test methods, the year of publication for these test methods is as shown in the following table:

Test method	Year of publication
AASHTO M 17	2011 (2015)
AASHTO M 323	2013
AASHTO R 30	2002 (2015)
AASHTO R 35	2014
AASHTO T 27	2014
AASHTO T 49	2014
AASHTO T 59	2013
AASHTO T 96	2002 (2010)
AASHTO T 164	2014
AASHTO T 176	2008
AASHTO T 209	2012
AASHTO T 269	2014
AASHTO T 275	2007 (2012)
AASHTO T 283	2014
AASHTO T 304	2011
AASHTO T 305	2014
AASHTO T 308	2010
AASHTO T 312	2014
AASHTO T 324	2014
AASHTO T 329	2013
AASHTO T 335	2009
ASTM D36/D36M	2014 <sup>ε1</sup>
ASTM D92	2012b
ASTM D217	2010
ASTM D297	2013
ASTM D445	2014
ASTM D2007	2011
ASTM D2074	2007 (Reapproved 2013)
ASTM D2995	1999 (Reapproved 2009)
ASTM D4791	2010
ASTM D5329	2009
ASTM D7741/D7741M	2011 <sup>ε1</sup>

### 39-2.01A(2) Definitions

**binder replacement:** Binder from RAP expressed as a percent of the total binder in the mix.

**coarse aggregate:** Aggregate retained on a no. 4 sieve.

**fine aggregate:** Aggregate passing a no. 4 sieve.

**leveling course:** Thin layer of HMA used to correct minor variations in the longitudinal and transverse profile of the pavement before placement of other pavement layers.

**miscellaneous areas:** Areas outside the traveled way and shoulders such as:

1. Median areas not including inside shoulders
2. Island areas
3. Sidewalks
4. Gutters
5. Ditches
6. Overside drains
7. Aprons at ends of drainage structures

**processed RAP:** RAP that has been fractionated.

**supplemental fine aggregate:** Mineral filler consisting of rock dust, slag dust, hydrated lime, hydraulic cement, or any combination of these and complying with AASHTO M 17.

### **39-2.01A(3) Submittals**

#### **39-2.01A(3)(a) General**

Reserved

#### **39-2.01A(3)(b) Job Mix Formula**

##### **39-2.01A(3)(b)(i) General**

Except for the HMA to be used in miscellaneous areas and dikes, submit your proposed JMF for each type of HMA to be used. The JMF must be submitted on the Contractor Job Mix Formula Proposal form along with:

1. Mix design documentation on Contractor Hot Mix Asphalt Design Data form dated within 12 months of submittal
2. JMF verification on a Caltrans Hot Mix Asphalt Verification form, if applicable
3. JMF renewal on a Caltrans Job Mix Formula Renewal form, if applicable
4. SDS for:
  - 4.1. Asphalt binder
  - 4.2. Supplemental fine aggregate except fines from dust collectors
  - 4.3. Antistrip additives

The Contractor Hot Mix Asphalt Design Data form must show documentation on aggregate quality.

If you cannot submit a Department-verified JMF on a Caltrans Hot Mix Asphalt Verification form dated within 12 months before HMA production, the Engineer verifies the JMF.

Submit a new JMF if you change any of the following:

1. Target asphalt binder percentage greater than  $\pm 0.2$  percent
2. Asphalt binder supplier
3. Combined aggregate gradation
4. Aggregate sources
5. Liquid antistrip producer or dosage
6. Average binder content in a new processed RAP stockpile by more than  $\pm 2.00$  percent from the average RAP binder content reported on page 4 of your Contractor Hot Mix Asphalt Design Data form
7. Average maximum specific gravity in a new processed RAP stockpile by more than  $\pm 0.060$  from the average maximum specific gravity value reported on page 4 of your Contractor Hot Mix Asphalt Design Data form
8. Any material in the JMF

Allow the Engineer 5 business days from a complete JMF submittal for document review of the aggregate qualities, mix design, and JMF. The Engineer notifies you if the proposed JMF submittal is accepted.

If your JMF fails verification testing, submit an adjusted JMF based on your testing. The adjusted JMF must include a new Contractor Job Mix Formula Proposal form, Contractor Hot Mix Asphalt Design Data form, and the results of the failed verification testing.

You may submit an adjusted aggregate gradation TV on a Contractor Job Mix Formula Proposal form before verification testing. Aggregate gradation TV must be within the TV limits specified.

##### **39-2.01A(3)(b)(ii) Job Mix Formula Renewal**

You may request a JMF renewal by submitting:

1. Proposed JMF on a Contractor Job Mix Formula Proposal form

2. Previously verified JMF documented on a Caltrans Hot Mix Asphalt Verification form dated within 12 months
3. Mix design documentation on a Contractor Hot Mix Asphalt Design Data form used for the previously verified JMF

### **39-2.01A(3)(b)(iii) Job Mix Formula Modification**

For an authorized JMF, submit a modified JMF if you change any of the following:

1. Asphalt binder supplier
2. Liquid antistriper producer
3. Liquid antistriper dosage

You may change any of the above items only once during the Contract.

Submit your modified JMF request at least 15 days before production. Each modified JMF submittal must include:

1. Proposed modified JMF on Contractor Job Mix Formula Proposal form, marked *Modified*.
2. Mix design records on Contractor Hot Mix Asphalt Design Data form for the authorized JMF to be modified.
3. JMF verification on Hot Mix Asphalt Verification form for the authorized JMF to be modified.
4. Test results for the modified JMF in compliance with the mix design specifications. Perform tests at the mix design OBC as shown on the Contractor Asphalt Mix Design Data form.

With an accepted modified JMF submittal, the Engineer verifies each modified JMF within 10 days of receiving all verification samples.

### **39-2.01A(3)(c) Quality Control Plan**

With your proposed JMF submittal, submit a QC plan for HMA.

The QC plan must describe the organization and procedures for:

1. Controlling HMA quality characteristics
2. Taking samples, including sampling locations
3. Establishing, implementing, and maintaining QC
4. Determining when corrective actions are needed
5. Implementing corrective actions
6. Using methods and materials for backfilling core locations

The QC plan must address the elements affecting HMA quality, including:

1. Aggregates
2. Asphalt binder
3. Additives
4. Production
5. Paving

The QC plan must include aggregate QC sampling and testing during lime treatment.

Allow 5 business days for review of the QC plan.

If you change QC procedures, personnel, or sample testing locations, submit a QC plan supplement before implementing the proposed change. Allow 3 business days for review of the QC plan supplement.

### **39-2.01A(3)(d) Test Results**

For mix design, JMF verification, production start-up, and each 10,000 tons, submit AASHTO T 283 and AASHTO T 324 (Modified) test results to the Engineer and electronically to:

Moisture\_Tests@dot.ca.gov

Submit all QC test results, except AASHTO T 283 and AASHTO T 324 (Modified), within 3 business days of a request. Submit AASHTO T 283 QC tests within 15 days of sampling.

For tests performed under AASHTO T 324 (Modified), submit test data and 1 tested sample set within 5 business days of sampling.

If coarse and fine durability index tests are required, submit test results within 2 business days of testing.

If a tapered notched wedge is used, submit compaction test result values within 24 hours of testing.

**39-2.01A(3)(e) Reserved**

**39-2.01A(3)(f) Liquid Antistrip Treatment**

If liquid antistrip treatment is used, submit the following with your proposed JMF submittal:

1. One 1 pt sample
2. Infrared analysis, including copy of absorption spectra
3. Certified copy of test results
4. Certificate of compliance for each liquid antistrip shipment. On each certificate of compliance, include:
  - 4.1. Your signature and printed name
  - 4.2. Shipment number
  - 4.3. Material type
  - 4.4. Material specific gravity
  - 4.5. Refinery
  - 4.6. Consignee
  - 4.7. Destination
  - 4.8. Quantity
  - 4.9. Contact or purchase order number
  - 4.10. Shipment date
5. Proposed proportions for the liquid antistrip

For each delivery of liquid antistrip to the HMA production plant, submit a 1 pt sample to METS. Submit shipping documents. Label each liquid antistrip sampling container with:

1. Liquid antistrip type
2. Application rate
3. Sample date
4. Contract number

At the end of each day's production shift, submit production data in electronic and printed media. Present data on electronic media in a tab delimited format. Use line feed carriage return with 1 separate record per line for each production data set. Allow enough fields for the specified data. Include data titles at least once per report. For each HMA mixing plant type, submit the following information in the order specified:

1. For batch plant mixing:
  - 1.1. Production date
  - 1.2. Time of batch completion
  - 1.3. Mix size and type
  - 1.4. Each ingredient's weight
  - 1.5. Asphalt binder content as a percentage of the total weight of mix
  - 1.6. Liquid antistrip content as a percentage of the asphalt binder weight
2. For continuous mixing plant:
  - 2.1. Production date
  - 2.2. Data capture time
  - 2.3. Mix size and type
  - 2.4. Flow rate of wet aggregate collected directly from the aggregate weigh belt



- 2.5. Aggregate moisture content as a percentage of the dry aggregate weight
- 2.6. Flow rate of asphalt binder collected from the asphalt binder meter
- 2.7. Flow rate of liquid antistriper collected from the liquid antistriper meter
- 2.8. Asphalt binder content as a percentage of the total weight of mix calculated from:
  - 2.8.1. Aggregate weigh belt output
  - 2.8.2. Aggregate moisture input
  - 2.8.3. Asphalt binder meter output
- 2.9. Liquid antistriper content as a percentage of the asphalt binder weight calculated from:
  - 2.9.1. Asphalt binder meter output
  - 2.9.2. Liquid antistriper meter output

### **39-2.01A(3)(g) Lime Treatment**

If aggregate lime treatment is used, submit the following with your proposed JMF submittal and each time you produce lime-treated aggregate:

- 1. Exact lime proportions for fine and coarse virgin aggregates
- 2. If marination is required, the averaged aggregate quality test results within 24 hours of sampling
- 3. For dry lime aggregate treatment, a treatment data log from the dry lime and aggregate proportioning device in the following order:
  - 3.1. Treatment date
  - 3.2. Time of day the data is captured
  - 3.3. Aggregate size being treated
  - 3.4. HMA type and mix aggregate size
  - 3.5. Wet aggregate flow rate collected directly from the aggregate weigh belt
  - 3.6. Aggregate moisture content, expressed as a percentage of the dry aggregate weight
  - 3.7. Flow rate of dry aggregate calculated from the flow rate of wet aggregate
  - 3.8. Dry lime flow rate
  - 3.9. Lime ratio from the authorized JMF for each aggregate size being treated
  - 3.10. Lime ratio from the authorized JMF for the combined aggregates
  - 3.11. Actual lime ratio calculated from the aggregate weigh belt output, aggregate moisture input, and dry lime meter output, expressed as a percentage of the dry aggregate weight
  - 3.12. Calculated difference between the authorized lime ratio and the actual lime ratio
- 4. For lime slurry aggregate treatment, a treatment data log from the slurry proportioning device in the following order:
  - 4.1. Treatment date
  - 4.2. Time of day the data is captured
  - 4.3. Aggregate size being treated
  - 4.4. Wet aggregate flow rate collected directly from the aggregate weigh belt
  - 4.5. Moisture content of the aggregate just before treatment, expressed as a percentage of the dry aggregate weight
  - 4.6. Dry aggregate flow rate calculated from the wet aggregate flow rate
  - 4.7. Lime slurry flow rate measured by the slurry meter
  - 4.8. Dry lime flow rate calculated from the slurry meter output
  - 4.9. Authorized lime ratio for each aggregate size being treated
  - 4.10. Actual lime ratio calculated from the aggregate weigh belt and slurry meter output, expressed as a percentage of the dry aggregate weight
  - 4.11. Calculated difference between the authorized lime ratio and actual lime ratio
  - 4.12. Dry lime and water proportions at the slurry treatment time

Each day during lime treatment, submit the treatment data log on electronic media in tab delimited format on a removable CD-ROM storage disk. Each continuous treatment data set must be a separate record using a line feed carriage return to present the specified data on 1 line. The reported data must include data titles at least once per report.

### **39-2.01A(3)(h) Warm Mix Asphalt Technology**

If a WMA technology is used, submit the following with your proposed JMF submittal:

1. SDS for the WMA technology
2. For water injection foam technology:
  - 2.1. Name of technology
  - 2.2. Proposed foaming water content
  - 2.3. Proposed HMA production temperature range
  - 2.4. Certification from binder supplier stating no antifoaming agent is used
3. For additive technology:
  - 3.1. Name of technology
  - 3.2. Percent admixture by weight of binder and percent admixture by total weight of HMA as recommended by the manufacturer
  - 3.3. Methodology for inclusion of admixture in laboratory-produced HMA
  - 3.4. Proposed HMA production temperature range

Collect and hold data for the duration of the Contract and submit the electronic media daily. The snapshot of production data must include the following:

1. Production date
2. Production location
3. Time of day the data is captured
4. HMA mix type being produced and target binder rate
5. HMA additive type, brand, and target rate
6. Temperature of the binder and HMA mixture
7. For a continuous mixing plant, the rate of flow of the dry aggregate calculated from the wet aggregate flow rate as determined by the conveyor scale
8. For a continuous mixing plant, the rate of flow of the asphalt meter
9. For a continuous mixing plant, the rate of flow of HMA additive meter
10. For batch plant mixing, actual batch weights of all ingredients
11. Dry aggregate to binder ratio calculated from metered ingredient output
12. Dry aggregate to HMA additive ratio calculated from metered output

At the end of each day's production shift, submit electronic and printed media from the HMA plant process controller. Present data on electronic media in comma-separated values or tab-separated values format. The captured data for the ingredients represented by the production snapshot must have allowances for sufficient fields to satisfy the amount of data required by these specifications and include data titles at least once per report.

### **39-2.01A(3)(i) Samples**

For the samples taken for JMF verification, submit 3 parts to the Engineer and use 1 part for your testing.

At production start-up and within 1,000 tons of the halfway point of production of HMA, submit samples split from your HMA production sample for AASHTO T 283 and AASHTO T 324 (Modified) tests.

### **39-2.01A(3)(j)–39-2.01A(3)(k) Reserved**

### **39-2.01A(3)(l) Data Cores**

Section 39-2.01A(3)(l) applies if a bid item for a data core is shown on the Bid Item List.

Submit a summary of data cores taken and a photograph of each data core to the Engineer and to:

Coring@dot.ca.gov

For each data core, the summary must include:

1. Project identification number
2. Date cored
3. Core identification number
4. Type of materials recovered
5. Type and approximate thickness of unstabilized material not recovered

6. Total core thickness
7. Thickness of each individual material to within:
  - 7.1. 1/2 inch for recovered material
  - 7.2. 1.0 inch for unstabilized material
8. Location, including:
  - 8.1. County
  - 8.2. Route
  - 8.3. Post mile
  - 8.4. Lane number
  - 8.5. Lane direction
  - 8.6. Station

Each data core digital photograph must include a ruler laid adjacent to the data core. Each photograph must include:

1. Core
2. Project identification number
3. Core identification number
4. Date cored
5. County
6. Route
7. Post mile
8. Lane number
9. Lane direction

**39-2.01A(3)(m)–39-2.01A(3)(o) Reserved**

**39-2.01A(4) Quality Assurance**

**39-2.01A(4)(a) General**

AASHTO T 324 (Modified) is AASHTO T 324 with the following parameters:

1. Target air voids must equal  $7.0 \pm 1.0$  percent
2. Specimen height must be  $60 \pm 1$  mm
3. Number of test specimens must be 4 to run 2 tests
4. Do not average the 2 test results
5. Test specimen must be a 150 mm gyratory compacted specimen
6. Test temperature must be set at:
  - 6.1.  $113 \pm 2$  degrees F for PG 58
  - 6.2.  $122 \pm 2$  degrees F for PG 64
  - 6.3.  $131 \pm 2$  degrees F for PG 70 and above
7. Measurements for impression must be taken at every 100 passes along the total length of the sample
8. Inflection point is the number of wheel passes at the intersection of the creep slope and the stripping slope at maximum rut depth
9. Testing shut off must be set at 25,000 passes
10. Submersion time for samples must not exceed 4 hours

Take samples under California Test 125.

If a WMA technology is used, a technical representative for the WMA technology must attend the preconstruction meeting.

**39-2.01A(4)(b) Job Mix Formula Verification**

The Engineer verifies the JMF from samples taken from HMA produced by the plant to be used. The production set point at the plant must be within  $\pm 0.2$  from the asphalt binder percentage TV shown in your Contractor Job Mix Formula Proposal form. Notify the Engineer at least 2 business days before sampling materials. Samples may be taken from a different project including a non-Department project if you make arrangements for the Engineer to be present during sampling.

In the Engineer's presence and from the same production run, take samples of:

1. Aggregates. Coarse, fine, and supplemental fine aggregates must be taken from the combined cold-feed belt or the hot bins. If lime treatment is required, samples must be taken from individual stockpiles before lime treatment. Samples must be at least 120 lb for each coarse aggregate, 80 lb for each fine aggregate, and 10 lb for each type of supplemental fine aggregate. For hot-bin samples, the Department combines these aggregate samples to verify the TV submitted on a Contractor Job Mix Formula Proposal form.
2. Asphalt binder. Take at least two 1 qt samples. Each sample must be in a cylindrical-shaped can with an open top and friction lid. If the asphalt binder is modified or rubberized, the asphalt binder must be sampled with the components blended in the proportions to be used.
3. RAP. Samples must be at least 50 lb from each fractionated stockpile used or 100 lb from the belt.
4. Plant-produced HMA. The HMA samples must be at least 250 lb.

For aggregate, RAP, and HMA, split the samples into at least 4 parts and label their containers. Three parts are for the Department's verification testing and 1 part is for your testing.

After acceptance of the JMF submittal, the Engineer verifies each proposed JMF within 20 days of receiving all verification samples.

For JMF verification, the Engineer tests the following for compliance with the specifications:

1. Aggregate quality
2. Aggregate gradation
3. Voids in mineral aggregate on laboratory-produced HMA
4. HMA quality characteristics for Department acceptance

To verify the HMA for air voids, voids in mineral aggregate, and dust proportion, the Engineer uses an average of 3 briquettes. The Engineer tests plant-produced material.

If the Engineer verifies the JMF, the Engineer furnishes you a Hot Mix Asphalt Verification form.

If the Engineer's test results on plant-produced samples do not show compliance with the specifications, the Engineer notifies you. Adjust your JMF based on your testing unless the Engineer authorizes reverification without adjustments. JMF adjustments may include a change in:

1. Asphalt binder content TV up to  $\pm 0.20$  percent from the OBC value submitted on the Contractor Hot Mix Asphalt Design Data form
2. Aggregate gradation TV within the TV limits specified in the aggregate gradation table

You may adjust the JMF only once due to a failed verification test.

For each HMA type and aggregate size specified, the Engineer verifies up to 2 proposed JMF submittals including a JMF adjusted after verification failure. If you submit more than 2 JMFs for each type of HMA and aggregate size, the Engineer deducts \$3,000 from payments for each verification exceeding this limit. This deduction does not apply to verifications initiated by the Engineer or if a JMF expires while HMA production is stopped longer than 30 days.

A verified JMF is valid for 12 months.

### **39-2.01A(4)(c) Job Mix Formula Authorization**

You may start HMA production if:

1. Engineer's review of the JMF shows compliance with the specifications
2. Department has verified the JMF within 12 months before HMA production
3. Engineer authorizes the verified JMF

### **39-2.01A(4)(d) Job Mix Formula Renewal**

For a JMF renewal and upon request, in the Engineer's presence and from the same production run, take samples of:

1. Aggregates. Coarse, fine, and supplemental fine aggregates must be taken from the combined cold-feed belt or the hot bins. If lime treatment is required, samples must be taken from individual stockpiles before lime treatment. Samples must be at least 120 lb for each coarse aggregate, 80 lb for each fine aggregate, and 10 lb for each type of supplemental fines. For hot-bin samples, the Department combines these aggregate samples to verify the TV submitted on a Contractor Job Mix Formula Proposal form.
2. Asphalt binder. Take at least two 1 qt samples. Each sample must be in a cylindrical-shaped can with an open top and friction lid. If the asphalt binder is modified or rubberized, the asphalt binder must be sampled with the components blended in the proportions to be used.
3. RAP. Samples must be at least 50 lb from each fractionated stockpile.
4. Plant-produced HMA. The HMA samples must be at least 250 lb.

Notify the Engineer at least 2 business days before sampling materials. For aggregate, RAP, and HMA, split samples into at least 4 parts. Submit 3 parts and use 1 part for your testing.

Allow the Engineer 5 business days from a complete JMF reverification submittal for document review of the aggregate qualities, mix design, and JMF.

The most recent aggregate quality test results within the past 12 months may be used for verification of JMF renewal or upon request, the Engineer may perform aggregate quality tests for verification of JMF renewal.

The Engineer verifies the JMF for renewal under section 39-2.01A(4)(b) except:

1. Engineer keeps the samples until you provide test results for your part on a Contractor Job Mix Formula Renewal form.
2. Department tests samples of materials obtained from the HMA production unit after you submit test results that comply with the mix design specifications.
3. After completion of the JMF verification renewal document review, the Engineer verifies each proposed JMF within 20 days of receiving the verification renewal samples and the complete Contractor Job Mix Formula Renewal form.
4. You may not adjust the JMF due to a failed verification.
5. For each HMA type and aggregate gradation specified, the Engineer verifies at no cost to you 1 proposed JMF renewal within a 12-month period.

If the Engineer verifies the JMF renewal, the Engineer furnishes you a Hot Mix Asphalt Verification form. The Hot Mix Asphalt Verification form is valid for 12 months.

### **39-2.01A(4)(e) Job Mix Formula Modification**

The Engineer verifies the modified JMF after the modified JMF HMA is placed and verification samples are taken within the first 750 tons. The Engineer tests verification samples for compliance with:

1. Hamburg wheel track mix design specifications
2. Air void content
3. Voids in mineral aggregate on plant-produced HMA mix design specifications
4. Dust proportion mix design specifications

The Engineer may test for moisture susceptibility for compliance with the mix design specifications.

If the modified JMF is verified, the Engineer revises your Hot Mix Asphalt Verification form to include the new asphalt binder source, new liquid antistriper producer, or new liquid antistriper dosage. Your revised form will have the same expiration date as the original form.

If a modified JMF is not verified, stop production and any HMA placed using the modified JMF is rejected.

The Engineer deducts \$2,000 from payments for each JMF modification.

**39-2.01A(4)(f) Certifications**

**39-2.01A(4)(f)(i) General**

Laboratories testing aggregate and HMA qualities used to prepare the mix design and JMF must be qualified under AASHTO Materials Reference Laboratory program and the Department's Independent Assurance Program.

**39-2.01A(4)(f)(ii) Hot Mix Asphalt Plants**

Before production, the HMA plant must have a current qualification under the Department's Material Plant Quality Program.

**39-2.01A(4)(f)(iii)–39-2.01A(4)(f)(v) Reserved**

**39-2.01A(4)(g) Reserved**

**39-2.01A(4)(h) Quality Control**

**39-2.01A(4)(h)(i) General**

QC test results must comply with the specifications for Department acceptance.

Prepare 3 briquettes for air voids content and voids in mineral aggregate determination. Report the average of 3 tests.

Except for smoothness, if 2 consecutive QC test results or any 3 QC test results for 1 day's production do not comply with the materials specifications:

1. Stop HMA production
2. Notify the Engineer
3. Take corrective action
4. Demonstrate compliance with the specifications before resuming production and placement

For QC tests performed under AASHTO T 27, results are considered 1 QC test regardless of number of sieves out of compliance.

Do not resume production and placement until the Engineer authorizes your corrective action proposal.

**39-2.01A(4)(h)(ii) Reserved**

**39-2.01A(4)(h)(iii) Aggregates**

**39-2.01A(4)(h)(iii)(A) General**

Reserved

**39-2.01A(4)(h)(iii)(B) Aggregate Lime Treatments**

If lime treatment is required, sample coarse and fine aggregates from individual stockpiles before lime treatment. Combine aggregate in the JMF proportions. Test the aggregates under the test methods and frequencies shown in the following table:

### Aggregate Quality Control During Lime Treatment

Quality characteristic	Test method	Minimum sampling and testing frequency
Sand equivalent <sup>a, b</sup>	AASHTO T 176	1 per 750 tons of untreated aggregate
Percent of crushed particles	AASHTO T 335	1 per 10,000 tons or 2 per project whichever is greater
Los Angeles Rattler	AASHTO T 96	
Fine aggregate angularity	AASHTO T 304, Method A	
Flat and elongated particles	ASTM D4791	

<sup>a</sup>Report test results as the average of 3 tests from a single sample.

<sup>b</sup>Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, "Manual Shaker," 7.1.2, "Alternate Method No. 2," and 8.4.3, "Hand Method," do not apply. Prepare the stock solution as specified in section 4.8.1, "Stock solution with formaldehyde," except omit the addition of formaldehyde.

For lime slurry aggregate treatment, determine the aggregate moisture content at least once every 2 hours of treatment. Calculate moisture content under AASHTO T 255 and report it as a percent of dry aggregate weight. Use the moisture content calculations as a set point for the proportioning process controller.

The device controlling lime and aggregate proportioning must produce a treatment data log. The log must consist of a series of data sets captured at 10-minute intervals throughout daily treatment. The data must be a treatment activity register and not a summation. The material represented by a data set is the quantity produced 5 minutes before and 5 minutes after the capture time. Collected data must be stored by the controller for the duration of the Contract.

If 3 consecutive sets of recorded treatment data indicate a deviation of more than 0.2 percent above or below the lime ratio in the authorized JMF, stop treatment and take corrective action.

If a set of recorded treatment data indicates a deviation of more than 0.4 percent above or below the lime ratio in the authorized JMF, stop treatment and do not use the material represented by that set of data in HMA.

If 20 percent or more of the total daily treatment indicates a deviation of more than 0.2 percent above or below the lime ratio in the authorized JMF, stop treatment and do not use that day's treated aggregate in HMA.

The Engineer may order you to stop aggregate treatment activities for any of following:

1. You fail to submit treatment data log.
2. You fail to submit aggregate QC data for marinated aggregate.
3. You submit incomplete, untimely, or incorrectly formatted data.
4. You do not take corrective actions.
5. You take late or unsuccessful corrective actions.
6. You do not stop treatment when proportioning tolerances are exceeded.
7. You use malfunctioning or failed proportioning devices.

If you stop treatment for noncompliance, notify the Engineer of any corrective actions taken and conduct a successful 20-minute test run before resuming treatment.

#### **39-2.01A(4)(h)(iv) Liquid Antistrip Treatment**

For continuous mixing or batch-plant mixing, sample asphalt binder before adding liquid antistrip. For continuous mixing, sample the combined asphalt binder and liquid antistrip after the static mixer.

#### **39-2.01A(4)(h)(v) Production Start-up Evaluation**

You and the Engineer evaluate HMA production and placement at production start-up.

Within the first 750 tons produced on the 1st day of HMA production, in the Engineer's presence, and from the same production run, take samples of:

1. Aggregates
2. Asphalt binder
3. RAP
4. HMA

Sample aggregates from the combined cold-feed belt or hot bin. Take RAP samples from the RAP system.

For aggregates, RAP, and HMA, split the samples into at least 4 parts and label their containers. Submit 3 parts and keep 1 part.

You and the Engineer must test the samples and report test results, except for AASHTO T 324 (Modified) and AASHTO T 283 test results, within 5 business days of sampling. For AASHTO T 324 (Modified) and AASHTO T 283 test results, report test results within 15 days of sampling. If you proceed before receipt of the test results, the Engineer may consider the HMA placed to be represented by these test results.

Take one 4- or 6-inch diameter density core for each 250 tons or portion thereof of HMA placed. For each density core, the Engineer reports the bulk specific gravity determined under AASHTO T 275, Method A, in addition to the percent of theoretical maximum density.

#### **39-2.01A(4)(h)(vi) Hot Mix Asphalt Density**

During HMA placement determine HMA density using a nuclear gauge. On the 1st day of production, develop a correlation factor between cores and nuclear gauge under California Test 375.

Test for in-place density using cores and a nuclear gauge. Test at random locations you select and include the test results in your QC production tests reports.

#### **39-2.01A(4)(h)(vii) Tapered Notched Wedge**

Perform QC testing on the completed tapered notched wedge joint as follows:

1. Perform density tests using a calibrated nuclear gauge at a rate of 1 test for every 750-foot section along the joint. Select random locations for testing within each 750-foot section.
2. Perform density tests at the centerline of the joint, 6 inches from the upper vertical notch, after the adjacent lane is placed and before opening the pavement to traffic.
3. Determine theoretical maximum density.
4. Determine percent compaction of the longitudinal joint as the ratio of the daily average density to the maximum density test results.

Determine percent compaction values each day the tapered notched wedge joint is completed. If the percent compaction of 1 day's production is less than 91 percent, that day's notched wedge joint is rejected. Discontinue placement of the tapered notched wedge and notify the Engineer of changes you will make to your construction process to comply with the specifications.

#### **39-2.01A(4)(h)(viii) Density Cores**

Except for HMA pavement placed using method compaction, take 4- or 6-inch diameter density cores at least once every 5 business days. Take 1 density core for every 250 tons of HMA from random locations the Engineer selects. Take density cores in the Engineer's presence, and backfill and compact holes with authorized material. Before submitting a density core, mark it with the density core's location and place it in a protective container.

If a density core is damaged, replace it with a density core taken within 1 foot longitudinally from the original density core location. Relocate any density core located within 1 foot of a rumble strip to 1 foot transversely away from the rumble strip.



For a tapered notched wedge joint, take 4- or 6-inch diameter density cores 6 inches from the upper vertical notch of the completed longitudinal joint for every 3,000 feet at locations selected by the Engineer. Take cores after the adjacent lane is placed and before opening the pavement to traffic. Take cores in the presence of the Engineer, and backfill and compact holes with authorized material. Before submitting a density core, mark it with the core's location, and place it in a protective container.

**39-2.01A(4)(h)(ix) Pavement Smoothness**

For HMA pavement within 3 feet from and parallel to the construction joint formed between curbs, gutters, or existing pavement, test pavement smoothness using a 12-foot straightedge.

**39-2.01A(4)(h)(x) Reserved**

**39-2.01A(4)(i) Department Acceptance**

**39-2.01A(4)(i)(i) General**

The Department tests treated aggregate for acceptance before lime treatment except for gradation.

The Engineer takes HMA samples for AASHTO T 283 and AASHTO T 324 (Modified) from any of the following locations:

1. Plant
2. Truck
3. Windrow

The Engineer takes HMA samples for all other tests from any of the following locations:

1. Plant
2. Truck
3. Windrow
4. Mat behind the paver

To obtain workability of the HMA sample for splitting, the Engineer reheats each sample of HMA mixture not more than 2 cycles. Each reheat cycle is performed by placing the loose mixture in a mechanical forced-draft oven for 2 hours or less after the sample reaches 140 degrees F.

The Engineer conditions each at-the-plant sample of HMA mixture in compliance with sections 7.1.2, 7.1.3, and 7.1.4 of AASHTO R 30.

The Engineer splits samples and provides you with a part if you request this.

No single test result may represent more than 750 tons or one day's production, whichever is less, except AASHTO T 283 and AASHTO T 324 (Modified).

Except for smoothness, if 2 consecutive Department acceptance test results or any 3 Department acceptance test results for 1 day's production do not comply with the specifications:

1. Stop HMA production
2. Take corrective action
3. Demonstrate compliance with the specifications before resuming production and placement

For Department acceptance tests performed under AASHTO T 27, results are considered 1 Department acceptance test regardless of the number of sieves out of compliance.

The Engineer accepts HMA based on:

1. Authorized JMF
2. Authorized QC plan
3. Asphalt binder compliance
4. Asphalt emulsion compliance
5. Visual inspection

6. Pavement smoothness

**39-2.01A(4)(i)(ii) In-Place Density**

Except for HMA pavement placed using method compaction, the Engineer tests the density core you take from each 250 tons of HMA. The Engineer determines the percent of theoretical maximum density for each density core by determining the density core's density and dividing by the theoretical maximum density.

Density cores must be taken from the final layer, cored through the entire pavement thickness shown. Where OGFC is required, take the density cores before placing OGFC.

If the percent of theoretical maximum density does not comply with the specifications, the Engineer may accept the HMA and take a payment deduction as shown in the following table:

**Reduced Payment Factors for Percent of Maximum Theoretical Density**

HMA percent of maximum theoretical density	Reduced payment factor	HMA percent of maximum theoretical density	Reduced payment factor
91.0	0.0000	97.0	0.0000
90.9	0.0125	97.1	0.0125
90.8	0.0250	97.2	0.0250
90.7	0.0375	97.3	0.0375
90.6	0.0500	97.4	0.0500
90.5	0.0625	97.5	0.0625
90.4	0.0750	97.6	0.0750
90.3	0.0875	97.7	0.0875
90.2	0.1000	97.8	0.1000
90.1	0.1125	97.9	0.1125
90.0	0.1250	98.0	0.1250
89.9	0.1375	98.1	0.1375
89.8	0.1500	98.2	0.1500
89.7	0.1625	98.3	0.1625
89.6	0.1750	98.4	0.1750
89.5	0.1875	98.5	0.1875
89.4	0.2000	98.6	0.2000
89.3	0.2125	98.7	0.2125
89.2	0.2250	98.8	0.2250
89.1	0.2375	98.9	0.2375
89.0	0.2500	99.0	0.2500
<89.0	Remove and replace	>99.0	Remove and replace

For acceptance of a completed tapered notched wedge joint, the Engineer determines density from cores you take every 3,000 feet.

**39-2.01A(4)(i)(iii) Pavement Smoothness**

For areas that require pavement smoothness determined using an inertial profiler, the pavement surface must:

1. Have no areas of localized roughness with an International Roughness Index greater than 160 in/mi
2. Comply with the Mean Roughness Index requirements shown in the following table for a 0.1 mile section:

### HMA Pavement Smoothness Acceptance Criteria

HMA thickness	Mean Roughness Index requirement
> 0.20 foot	60 in/mi or less
≤ 0.20 foot	75 in/mi or less

Note: These requirements do not apply to the OGFC surface. Smoothness requirements for OGFC are specified in section 39-2.04A(4)(c)(iii).

The final surface of HMA must comply with the Mean Roughness Index requirements before placing OGFC. Correct pavement to the Mean Roughness Index specifications. Areas of localized roughness greater than 160 in/mi must be corrected regardless of the Mean Roughness Index values of a 0.1-mile section.

#### **39-2.01A(4)(i)(iv) Dispute Resolution**

You and the Engineer must work together to avoid potential conflicts and to resolve disputes regarding test result discrepancies. Notify the Engineer within 5 business days of receiving a test result if you dispute the test result.

If you or the Engineer dispute the other's test results, submit your test results and copies of paperwork including worksheets used to determine the disputed test results. An independent third party performs referee testing. Before the third party participates in a dispute resolution, it must be qualified under AASHTO Materials Reference Laboratory program, and the Department's Independent Assurance Program. The independent third party must have no prior direct involvement with this Contract. By mutual agreement, the independent third party is chosen from:

1. Department laboratory in a district or region not in the district or region the project is located
2. Transportation Laboratory
3. Laboratory not currently employed by you or your HMA producer

If the Department's portion of the split QC samples or acceptance samples are not available, the independent third party uses any available material representing the disputed HMA for evaluation.

For a dispute involving JMF verification, the independent third party performs referee testing as specified in the 5th paragraph of section 39-2.01A(4)(b).

If the independent third party determines the Department's test results are valid, the Engineer deducts the independent third party's testing costs from payments. If the independent third party determines your test results are valid, the Department pays the independent third party's testing costs.

#### **39-2.01B Materials**

##### **39-2.01B(1) General**

Reserved

##### **39-2.01B(2) Mix Design**

###### **39-2.01B(2)(a) General**

The HMA mix design must comply with AASHTO R 35 except:

1. Notes 3, 6, and 10 do not apply
2. AASHTO M 323 does not apply on combinations of aggregate gradation and asphalt binder contents to determine the OBC and HMA mixture qualities

The Contractor Hot Mix Asphalt Design Data form must show documentation on aggregate quality.

### **39-2.01B(2)(b) Hot Mix Asphalt Treatments**

If the test results for AASHTO T 283 or AASHTO T 324 (Modified) for untreated plant-produced HMA are less than the minimum requirements for HMA mix design, determine the plasticity index of the aggregate blend under California Test 204.

Do not use an aggregate blend with a plasticity index greater than 10.

If the plasticity index is from 4 to 10, treat the aggregate with dry lime with marination or lime slurry with marination.

If the plasticity index is less than 4, treat the aggregate with dry lime or lime slurry with marination, or treat the HMA with liquid antistripping.

### **39-2.01B(2)(c) Warm Mix Asphalt Technology**

For HMA with WMA additive technology, produce HMA mix samples for your mix design using your methodology for inclusion of WMA admixture in laboratory-produced HMA. Cure the samples in a forced-air draft oven at 275 degrees F for 4 hours  $\pm$  10 minutes.

For WMA water injection foam technology, the use of foamed asphalt for mix design is not required.

### **39-2.01B(3) Asphalt Binder**

Asphalt binder must comply with section 92.

For a leveling course, the grade of asphalt binder for the HMA must be PG 64-10 or PG 64-16.

### **39-2.01B(4) Aggregates**

#### **39-2.01B(4)(a) General**

Aggregates must be clean and free from deleterious substances.

The aggregates for a leveling course must comply with the gradation specifications for Type A HMA in section 39-2.02B.

#### **39-2.01B(4)(b) Aggregate Gradations**

Aggregate gradation must be determined before the addition of asphalt binder and must include supplemental fine aggregates. Test for aggregate gradation under AASHTO T 27. Do not wash the coarse aggregate. Wash the fine aggregate only. Use a mechanical sieve shaker. Aggregate shaking time must not exceed 10 minutes for each coarse and fine aggregate portion.

Choose a TV within the TV limits shown in the tables titled "Aggregate Gradations."

Gradations are based on nominal maximum aggregate size.

#### **39-2.01B(4)(c) Aggregate Lime Treatments**

##### **39-2.01B(4)(c)(i) General**

If aggregate lime treatment is required as specified in section 39-2.01B(2)(b), the virgin aggregate must comply with the aggregate quality specifications.

Lime for treating aggregate must comply with section 24-2.02.

Water for lime treatment of aggregate with lime slurry must comply with section 24-1.02B.

Notify the Engineer at least 24 hours before the start of aggregate treatment.

Do not treat RAP.

The lime ratio is the pounds of dry lime per 100 lb of dry virgin aggregate expressed as a percentage. Water content of slurry or untreated aggregate must not affect the lime ratio.

Coarse and fine aggregate fractions must have the lime ratio ranges shown in the following table:

Aggregate fractions	Lime ratio percent
Coarse	0.4–1.0
Fine	1.5–2.0
Combined	0.8–1.5

The lime ratio for fine and coarse aggregate must be within  $\pm 0.2$  percent of the lime ratio in the accepted JMF. The lime ratio must be within  $\pm 0.2$  percent of the authorized lime ratio when you combine the individual aggregate sizes in the JMF proportions. The lime ratio must be determined before the addition of RAP.

If marination is required, marinate treated aggregate in stockpiles from 24 hours to 60 days before using in HMA. Do not use aggregate marinated longer than 60 days.

Treated aggregate must not have lime balls or clods.

### **39-2.01B(4)(c)(ii) Dry Lime**

If marination is required:

1. Treat and marinate coarse and fine aggregates separately
2. Treat the aggregate and stockpile for marination only once
3. Treat the aggregate separately from HMA production

Proportion dry lime by weight with an automatic continuous proportioning system.

If you use a batch-type proportioning system for HMA production, control proportioning in compliance with the specifications for continuous mixing plants. Use a separate dry lime aggregate treatment system for HMA batch mixing including:

1. Pugmill mixer
2. Controller
3. Weigh belt for the lime
4. Weigh belt for the aggregate

If a continuous mixing plant for HMA production without lime-marinated aggregates is used, use a controller that measures the blended aggregate weight after any additional water is added to the mixture. The controller must determine the quantity of lime added to the aggregate from the aggregate weigh belt input in connection with the manually input total aggregate moisture, the manually input target lime content, and the lime proportioning system output. Use a continuous aggregate weigh belt and pugmill mixer for lime treatment in addition to the weigh belt for the aggregate proportioning to asphalt binder in the HMA plant. If you use a water meter for moisture control for lime treatment, the meter must comply with Department's *MPQP* manual.

When mixing dry lime with aggregate, the aggregate moisture content must ensure complete lime coating. The aggregate moisture content must not cause aggregate to be lost between the point of weighing the combined aggregate continuous stream and the dryer. Add water to the aggregate for mixing and coating before dry lime addition. Immediately before mixing lime with aggregate, water must not visibly separate from the aggregate.

Mix aggregate, water, and dry lime with a continuous pugmill mixer with twin shafts. Immediately before mixing lime with aggregate, water must not visibly separate from the aggregate. Store dry lime in a uniform and free-flowing condition. Introduce dry lime to the pugmill in a continuous process. The introduction must occur after the aggregate cold feed and before the point of proportioning across a weigh belt and the aggregate dryer. Prevent loss of dry lime.

The pugmill must be equipped with paddles arranged to provide sufficient mixing action and mixture movement. The pugmill must produce a homogeneous mixture of uniformly coated aggregates at mixer discharge.

If the aggregate treatment process is stopped longer than 1 hour, clean the equipment of partially treated aggregate and lime.

Aggregate must be completely treated before introduction into the mixing drum.

### **39-2.01B(4)(c)(iii) Lime Slurry**

For lime slurry aggregate treatment, treat aggregate separate from HMA production. Stockpile and marinate the aggregate.

Proportion lime and water with a continuous or batch mixing system.

Add lime to the aggregate as slurry consisting of mixed dry lime and water at a ratio of 1 part lime to from 2 to 3 parts water by weight. The slurry must completely coat the aggregate.

Immediately before mixing lime slurry with the aggregate, water must not visibly separate from the aggregate.

Proportion lime slurry and aggregate by weight in a continuous process.

### **39-2.01B(5) Liquid Antistrip Treatment**

Liquid antistrip must be from 0.25 to 1.0 percent by weight of asphalt binder. Do not use liquid antistrip as a substitute for asphalt binder.

Liquid antistrip total amine value must be 325 minimum when tested under ASTM D2074.

Use only 1 liquid antistrip type or brand at a time. Do not mix liquid antistrip types or brands.

Store and mix liquid antistrip under the manufacturer's instructions.

### **39-2.01B(6)–39-2.01B(7) Reserved**

### **39-2.01B(8) Hot Mix Asphalt Production**

#### **39-2.01B(8)(a) General**

Do not start HMA production before verification and authorization of JMF.

The HMA plant must have a current qualification under the Department's Material Plant Quality Program.

Weighing and metering devices used for the production of HMA modified with additives must comply with the Department's *MPQP*. If a loss-in-weight meter is used for dry HMA additive, the meter must have an automatic and integral material delivery control system for the refill cycle.

Calibrate the loss-in-weight meter by:

1. Including at least 1 complete system refill cycle during each calibration test run
2. Operating the device in a normal run mode for 10 minutes immediately before starting the calibration process
3. Isolating the scale system within the loss-in-weight feeder from surrounding vibration
4. Checking the scale system within the loss-in-weight feeder for accuracy before and after the calibration process and daily during mix production
5. Using a minimum 15 minute or minimum 250 lb test run size for a dry ingredient delivery rate of less than 1 ton per hour.
6. Complying with the limits of Table B, "Conveyor Scale Testing Extremes," in the Department's *MPQP*

Proportion aggregate by hot or cold-feed control.

Aggregate temperature must not be more than 375 degrees F when mixed with the asphalt binder.

Asphalt binder temperature must be from 275 to 375 degrees F when mixed with aggregate.

Mix HMA ingredients into a homogeneous mixture of coated aggregates.

The temperature of HMA with or without RAP must not be more than 325 degrees F.

For HMA produced using WMA technology, the temperature of HMA must from 240 to 325 degrees F.

If method compaction is used, HMA must be produced at a temperature from 305 to 325 degrees F.

If you stop production for longer than 30 days, a production start-up evaluation is required.

### **39-2.01B(8)(b) Liquid Antistrip**

If 3 consecutive sets of recorded production data show that the actual delivered liquid antistrip weight is more than  $\pm 1$  percent of the authorized mix design liquid antistrip weight, stop production and take corrective action.

If a set of recorded production data shows that the actual delivered liquid antistrip weight is more than  $\pm 2$  percent of the authorized mix design liquid antistrip weight, stop production. If the liquid antistrip weight exceeds 1.2 percent of the asphalt binder weight, do not use the HMA represented by that data.

The continuous mixing plant controller proportioning the HMA must produce a production data log. The log must consist of a series of data sets captured at 10-minute intervals throughout daily production. The data must be a production activity register and not a summation. The material represented by the data is the quantity produced 5 minutes before and 5 minutes after the capture time. For the duration of the Contract, the collected data must be stored by the plant controller or a computer's memory at the plant.

The Engineer orders proportioning activities stopped for any of the following reasons:

1. You fail to submit data
2. You submit incomplete, untimely, or incorrectly formatted data
3. You fail to take corrective actions
4. You take late or unsuccessful corrective actions
5. You fail to stop production when proportioning tolerances are exceeded
6. You use malfunctioning or failed proportioning devices

If you stop production, notify the Engineer of any corrective actions taken before resuming.

### **39-2.01B(8)(c) Warm Mix Asphalt Technology**

Proportion all ingredients by weight. The HMA plant process controller must be the sole source of ingredient proportioning control and be fully interfaced with all scales and meters used in the production process. The addition of the HMA additive must be controlled by the plant process controller.

Liquid ingredient additive, including a normally dry ingredient made liquid, must be proportioned with a mass flow meter at continuous mixing plants. Use a mass flow meter or a container scale to proportion liquid additives at batch mixing plants.

Continuous mixing plants using HMA additives must comply with the following:

1. Dry ingredient additives for continuous production must be proportioned with a conveyor scale or a loss-in-weight meter.
2. HMA plant process controller and ingredient measuring systems must be capable of varying all ingredient-feed rates proportionate with the dry aggregate delivery at all production rates and rate changes.
3. Liquid HMA additive must enter the production stream with the binder. Dry HMA additive must enter the production stream at or before the mixing area.
4. If dry HMA additives are used at continuous mixing HMA plants, bag-house dust systems must return all captured material to the mix. This requirement is waived for lime-treated aggregates.
5. HMA additive must be proportioned to within  $\pm 0.3$  percent of the target additive rate.

Batch mixing plants using HMA additives must comply with the following:

1. Metered HMA additive must be placed in an intermediate holding vessel before being added to the stream of asphalt binder as it enters the pugmill.
2. If a container scale is used, weigh additive before combining with asphalt binder. Keep the container scale separate from other ingredient proportioning. The container scale capacity must be no more than twice the volume of the maximum additive batch size. The container scale's graduations must be smaller than the proportioning tolerance or 0.001 times the container scale capacity.
3. Dry HMA additive proportioning devices must be separate from metering devices for the aggregates and asphalt binder. Proportion dry HMA additive directly into the pugmill, or place in an intermediate holding vessel to be added to the pugmill at the appropriate time in the batch cycle. Dry ingredients for batch production must be proportioned with a hopper scale.
4. Zero tolerance for the HMA additive batch scale is  $\pm 0.5$  percent of the target additive weight. The indicated HMA additive batch scale weight may vary from the preselected weight setting by up to  $\pm 1.0$  percent of the target additive weight.

### **39-2.01B(9) Geosynthetic Pavement Interlayer**

Not used.

### **39-2.01B(10) Tack Coat**

Tack coat must comply with the specifications for asphaltic emulsion or asphalt binder. Choose the type and grade of emulsion or binder.

### **39-2.01B(11) Miscellaneous Areas and Dikes**

Not used

## **39-2.01C Construction**

### **39-2.01C(1) General**

Do not place HMA on wet pavement or frozen surface.

You may deposit HMA in a windrow and load it in the paver if:

1. Paver is equipped with a hopper that automatically feeds the screed
2. Loading equipment can pick up the windrowed material and deposit it in the paver hopper without damaging base material
3. Activities for depositing, pickup, loading, and paving are continuous
4. HMA temperature in the windrow does not fall below 260 degrees F

HMA placed in a windrow on the roadway surface must not extend more than 250 feet in front of the loading equipment or material transfer vehicle.

You may place HMA in 1 or more layers on areas less than 5 feet wide and outside the traveled way, including shoulders. You may use mechanical equipment other than a paver for these areas. The equipment must produce uniform smoothness and texture.

HMA handled, spread, or windrowed must not stain the finished surface of any improvement, including pavement.

Do not use petroleum products such as kerosene or diesel fuel to release HMA from trucks, spreaders, or compactors.

HMA must be free of:

1. Segregation
2. Coarse or fine aggregate pockets
3. Hardened lumps

Complete finish rolling activities before the pavement surface temperature is:

1. Below 150 degrees F for HMA with unmodified binder



2. Below 140 degrees F for HMA with modified binder
3. Below 130 degrees F for HMA with WMA technology

### **39-2.01C(2) Spreading and Compacting Equipment**

#### **39-2.01C(2)(a) General**

Paving equipment for spreading must be:

1. Self-propelled
2. Mechanical
3. Equipped with a screed or strike-off assembly that can distribute HMA the full width of a traffic lane
4. Equipped with a full-width compacting device
5. Equipped with automatic screed controls and sensing devices that control the thickness, longitudinal grade, and transverse screed slope

Install and maintain grade and slope references.

The screed must be heated and produce a uniform HMA surface texture without tearing, shoving, or gouging.

The paver must not leave marks such as ridges and indentations unless you can eliminate them by rolling.

Rollers must be equipped with a system that prevents HMA from sticking to the wheels. You may use a parting agent that does not damage the HMA or impede the bonding of layers.

In areas inaccessible to spreading and compacting equipment:

1. Spread the HMA by any means to obtain the specified lines, grades, and cross sections
2. Use a pneumatic tamper, plate compactor, or equivalent to achieve thorough compaction

#### **39-2.01C(2)(b) Material Transfer Vehicle**

If a material transfer vehicle is specified, the material transfer vehicle must have sufficient capacity to prevent stopping the paver and must be capable of:

1. Either receiving HMA directly from trucks or using a windrow pickup head to load it from a windrow deposited on the roadway surface
2. Remixing the HMA with augers before transferring into the paver's receiving hopper or feed system
3. Transferring HMA directly into the paver's receiving hopper or feed system

#### **39-2.01C(2)(c) Method Compaction Equipment**

For method compaction, each paver spreading HMA must be followed by 3 rollers:

1. One vibratory roller specifically designed to compact HMA. The roller must be capable of at least 2,500 vibrations per minute and must be equipped with amplitude and frequency controls. The roller's gross static weight must be at least 7.5 tons.
2. One oscillating-type pneumatic-tired roller at least 4 feet wide. Pneumatic tires must be of equal size, diameter, type, and ply. The tires must be inflated to 60 psi minimum and maintained so that the air pressure does not vary more than 5 psi.
3. One steel-tired, 2-axle tandem roller. The roller's gross static weight must be at least 7.5 tons.

Each roller must have a separate operator. Rollers must be self-propelled and reversible.

#### **39-2.01C(2)(d)–39-2.01C(2)(f) Reserved**

#### **39-2.01C(3) Surface Preparation**

##### **39-2.01C(3)(a) General**

Before placing HMA, remove loose paving particles, dirt, and other extraneous material by any means including flushing and sweeping.

**39-2.01C(3)(b) Subgrade**

Prepare subgrade to receive HMA under the sections for the material involved. Subgrade must be free of loose and extraneous material.

**39-2.01C(3)(c) Reserved****39-2.01C(3)(d) Prepaving Inertial Profiler**

Not used.

**39-2.01C(3)(e) Prepaving Grinding**

Not used except in areas specified for profile grinding as shown on the Plans.

**39-2.01C(3)(f) Tack Coat**

Apply a tack coat:

1. To existing pavement including planed surfaces
2. Between HMA layers
3. To vertical surfaces of:
  - 3.1. Curbs
  - 3.2. Gutters
  - 3.3. Construction joints

Equipment for the application of tack coat must comply with section 37-1.03B.

Before placing HMA, apply a tack coat in 1 application at the minimum residual rate shown in the following table for the condition of the underlying surface:

**Tack Coat Application Rates for HMA**

HMA over:	Minimum residual rates (gal/sq yd)		
	CSS1/CSS1h, SS1/SS1h and QS1h/CQS1h asphaltic emulsion	CRS1/CRS2, RS1/RS2 and QS1/CQS1 asphaltic emulsion	Asphalt binder and PMRS2/PMCERS2 and PMRS2h/PMCERS2h asphaltic emulsion
New HMA (between layers)	0.02	0.03	0.02
Concrete pavement and existing asphalt concrete surfacing	0.03	0.04	0.03
Planed pavement	0.05	0.06	0.04

If a stress absorbing membrane interlayer as specified in section 37-2.06 is applied, the tack coat application rates for new HMA apply.

Notify the Engineer if you dilute asphaltic emulsion with water. The weight ratio of added water to asphaltic emulsion must not exceed 1 to 1.

Measure added water either by weight or volume under section 9-1.02 or use water meters from water districts, cities, or counties. If you measure water by volume, apply a conversion factor to determine the correct weight.

With each dilution, submit:

1. Weight ratio of water to bituminous material in the original asphaltic emulsion
2. Weight of asphaltic emulsion before diluting
3. Weight of added water
4. Final dilution weight ratio of water to asphaltic emulsion

Apply a tack coat to vertical surfaces with a residual rate that will thoroughly coat the vertical face without running off.

If authorized, you may:

1. Change tack coat rates
2. Omit tack coat between layers of new HMA during the same work shift if:
  - 2.1. No dust, dirt, or extraneous material is present
  - 2.2. Surface is at least 140 degrees F

Immediately in advance of placing HMA, apply additional tack coat to damaged areas or where loose or extraneous material is removed.

Close areas receiving tack coat to traffic. Do not allow the tracking of tack coat onto pavement surfaces beyond the job site.

If you use an asphalt binder for tack coat, the asphalt binder temperature must be from 285 to 350 degrees F when applied.

#### **39-2.01C(3)(g) Geosynthetic Pavement Interlayer**

Not used.

#### **39-2.01C(4) Longitudinal Joints**

##### **39-2.01C(4)(a) General**

Longitudinal joints in the top layer must match lane lines. Alternate the longitudinal joint offsets in the lower layers at least 0.5 foot from each side of the lane line. Other longitudinal joint placement patterns are allowed if authorized.

A vertical longitudinal joint of more than 0.15 foot is not allowed at any time between adjacent lanes open to traffic.

For an HMA thickness of 0.15 foot or less, the distance between the ends of the adjacent surfaced lanes at the end of each day's work must not be greater than can be completed in the following day of normal paving.

For an HMA thickness greater than 0.15 foot, you must place HMA on adjacent traveled way lanes or shoulder such that at the end of each work shift the distance between the ends of HMA layers on adjacent lanes is from 5 to 10 feet. Place additional HMA along the transverse edge at each lane's end and along the exposed longitudinal edges between adjacent lanes. Hand rake and compact the additional HMA to form temporary conforms. You may place kraft paper or other authorized release agent under the conform tapers to facilitate the taper removal when paving activities resume.

If placing HMA against the edge of existing pavement, saw cut or grind the pavement straight and vertical along the joint and remove extraneous material.

##### **39-2.01C(4)(b) Tapered Notched Wedge - Deleted**

Not used.

##### **39-2.01C(5) Pavement Edge Treatments**

Construct edge treatment on the HMA pavement as shown.

Where a tapered edge is required, use the same type of HMA used for the adjacent lane or shoulder.

The edge of roadway where the tapered edge is to be placed must have a solid base, free of debris such as loose material, grass, weeds, or mud. Grade the areas to receive the tapered edge as required.

The tapered edge must be placed monolithic with the adjacent lane or shoulder and must be shaped and compacted with a device attached to the paver.

The device must be capable of shaping and compacting HMA to the required cross section as shown. Compaction must be accomplished by constraining the HMA to reduce the cross sectional area by 10 to 15 percent. The device must produce a uniform surface texture without tearing, shoving, or gouging and must not leave marks such as ridges and indentations. The device must be capable of transitioning to cross roads, driveways, and obstructions.

For the tapered edge, the angle of the slope must not deviate by more than  $\pm 5$  degrees from the angle shown. Measure the angle from the plane of the adjacent finished pavement surface.

If paving is done in multiple lifts, the tapered edge must be placed with each lift.

Short sections of hand work are allowed to construct tapered edge transitions.

#### **39-2.01C(6) Widening Existing Pavement**

Not used.

#### **39-2.01C(7) Shoulders, Medians, and Other Road Connections**

Not used.

#### **39-2.01C(8) Leveling**

Not used.

#### **39-2.01C(9) Miscellaneous Areas and Dikes**

Not used.

#### **39-2.01C(10)–39-2.01C(14) Reserved**

#### **39-2.01C(15) Compaction**

##### **39-2.01C(15)(a) General**

Rolling must leave the completed surface compacted and smooth without tearing, cracking, or shoving.

If a vibratory roller is used as a finish roller, turn the vibrator off.

Do not open new HMA pavement to traffic until its mid depth temperature is below 160 degrees F.

If the surface to be paved is both in sunlight and shade, pavement surface temperatures are taken in the shade.

##### **39-2.01C(15)(b) Method Compaction**

Use method compaction for any of the following conditions:

1. HMA pavement thickness shown is less than 0.15 foot
2. Replace asphalt concrete surfacing
3. Leveling courses
4. Areas the Engineer determines conventional compaction and compaction measurement methods are impeded

HMA compaction coverage is the number of passes needed to cover the paving width. A pass is 1 roller's movement parallel to the paving in either direction. Overlapping passes are part of the coverage being made and are not a subsequent coverage. Do not start a coverage until completing the prior coverage.

Method compaction must consist of performing:

1. Breakdown compaction of each layer with 3 coverages using a vibratory roller. The speed of the vibratory roller in miles per hour must not exceed the vibrations per minute divided by 1,000. If the HMA layer thickness is less than 0.08 foot, turn the vibrator off.
2. Intermediate compaction of each layer of HMA with 3 coverages using a pneumatic-tired roller at a speed not to exceed 5 mph.
3. Finish compaction of HMA with 1 coverage using a steel-tired roller.

Start rolling at the lower edge and progress toward the highest part.

The Engineer may order fewer coverages if the layer thickness of HMA is less than 0.15 foot.

**39-2.01C(15)(c)–39-2.01C(15)(e) Reserved**

**39-2.01C(16) Smoothness Corrections**

If the pavement surface does not comply with section 39-2.01A(4)(i)(iii), grind the pavement to within specified tolerances, remove and replace the pavement, or place an overlay of HMA. Do not start corrective work until your method is authorized.

Do not use equipment with carbide cutting teeth to grind the pavement unless authorized.

Smoothness corrections must leave at least 75 percent of the specified HMA thickness. If ordered, core the pavement at the locations selected by the Engineer. Coring, including traffic control, is change order work. Remove and replace deficient pavement areas where the overlay thickness is less than 75 percent of the thickness specified.

Corrected HMA pavement areas must be uniform rectangles with edges:

1. Parallel to the nearest HMA pavement edge or lane line
2. Perpendicular to the pavement centerline

On ground areas not to be overlaid with OGFC.

Where corrections are made within areas requiring testing with inertial profiler, reprofile the entire lane length with the inertial profiler.

Where corrections are made within areas requiring testing with a 12-foot straightedge, retest the corrected area with the straightedge.

**39-2.01C(17) Data Cores**

Section 39-2.01C(17) applies if a bid item for data core is shown on the Bid Item List.

Take data cores of the completed HMA pavement, underlying base, and subbase material. Notify the Engineer 3 business days before coring.

Protect data cores and surrounding pavement from damage.

Take 4-inch or 6-inch diameter data cores:

1. At the beginning, end, and every 1/2 mile within the paving limits of each route on the project
2. After all paving is complete
3. From the center of the specified lane

On a 2-lane roadway, take data cores from either lane. On a 4-lane roadway, take data cores from the outermost lane in each direction. On a roadway with more than 4 lanes, take data cores from the innermost lane and the outermost lane in each direction.

Each core must include the stabilized materials encountered. You may choose not to recover unstabilized material but you must identify the material. Unstabilized material includes any of the following:

1. Granular material
2. Crumbled or cracked stabilized material
3. Sandy or clayey soil

Where data core samples are taken, backfill and compact the holes with an authorized material.

After data core summary and photograph submittal, dispose of cores.

### **39-2.01D Payment**

The payment quantity for geosynthetic pavement interlayer is the area measured from the actual pavement covered.

Except for tack coat used in minor HMA, payment for tack coat is not included in the payment for hot mix asphalt.

The Department does not adjust the unit price for an increase or decrease in the tack coat quantity.

The payment quantity for HMA of the type shown on the Bid Item List is measured based on the combined mixture weight. If recorded batch weights are printed automatically, the bid item for HMA is measured by using the printed batch weights, provided:

1. Total aggregate and supplemental fine aggregate weight per batch is printed. If supplemental fine aggregate is weighed cumulatively with the aggregate, the total aggregate batch weight must include the supplemental fine aggregate weight.
2. Total virgin asphalt binder weight per batch is printed.
3. Each truckload's zero tolerance weight is printed before weighing the first batch and after weighing the last batch.
4. Time, date, mix number, load number and truck identification is correlated with a load slip.
5. Copy of the recorded batch weights is certified by a licensed weigh master and submitted.

The payment quantity for place hot mix asphalt dike of the type shown on the Bid Item List is the length measured from end to end. Payment for the HMA used to construct the dike is not included in the payment for place hot mix asphalt dike.

The payment quantity for place hot mix asphalt (miscellaneous areas) is the area measured for the in-place compacted area. Payment for the HMA used for miscellaneous areas is not included in the payment for place hot mix asphalt (miscellaneous areas).

The Engineer does not adjust the unit price for an increase or decrease in the prepaving grinding day quantity.

### **39-2.02 TYPE A HOT MIX ASPHALT**

#### **39-2.02A General**

##### **39-2.02A(1) Summary**

Section 39-2.02 includes specifications for producing and placing Type A hot mix asphalt.

You may produce Type A HMA using an authorized WMA technology.

##### **39-2.02A(2) Definitions**

Reserved

##### **39-2.02A(3) Submittals**

###### **39-2.02A(3)(a) General**

Reserved

###### **39-2.02A(3)(b) Job Mix Formula**

The JMF must be based on an HMA mix design determined as described in the *Superpave Mix Design: Superpave Series No. 2* manual by the Asphalt Institute.

###### **39-2.02A(3)(c) Reclaimed Asphalt Pavement**

Submit QC test results for RAP gradation with the combined aggregate gradation within 2 business days of taking RAP samples during Type A HMA production.

**39-2.02A(3)(d)–39-2.02A(3)(f) Reserved**

**39-2.02A(4) Quality Assurance**

**39-2.02A(4)(a) General**

Reserved

**39-2.02A(4)(b) Quality Control**

**39-2.02A(4)(b)(i) General**

Reserved

**39-2.02A(4)(b)(ii) Aggregates**

Test the quality characteristics of aggregates under the test methods and frequencies shown in the following table:

**Aggregate Testing Frequencies**

Quality characteristic	Test method	Minimum testing frequency
Gradation <sup>a</sup>	AASHTO T 27	1 per 750 tons and any remaining part
Sand equivalent <sup>b, c</sup>	AASHTO T 176	
Moisture content <sup>d</sup>	AASHTO T 255	
Crushed particles	AASHTO T 335	1 per 10,000 tons or 2 per project whichever is greater
Los Angeles Rattler	AASHTO T 96	
Flat and elongated particles	ASTM D4791	
Fine aggregate angularity	AASHTO T 304 Method A	

<sup>a</sup>If RAP is used, test the combined aggregate gradation under California Test 384.

<sup>b</sup>Reported value must be the average of 3 tests from a single sample.

<sup>c</sup>Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, "Manual Shaker," 7.1.2, "Alternate Method No. 2," and 8.4.3, "Hand Method," do not apply. Prepare the stock solution as specified in section 4.8.1, "Stock solution with formaldehyde," except omit the addition of formaldehyde.

<sup>d</sup>Test at continuous mixing plants only. If RAP is used, test the RAP moisture content at continuous mixing plant and batch mixing plant.

For lime treated aggregate, test aggregate before treatment and test for gradation and moisture content during HMA production.

**39-2.02A(4)(b)(iii) Reclaimed Asphalt Pavement**

Sample and test processed RAP at a minimum frequency of 1 sample per 1,000 tons with a minimum of 6 samples per fractionated stockpile. If the fractionated stockpile has not been augmented, the 3 RAP samples taken and tested for mix design can be part of this minimum sample requirement. If a processed RAP stockpile is augmented, sample and test processed RAP quality characteristics at a minimum frequency of 1 sample per 500 tons of augmented RAP.

The combined RAP sample when tested under AASHTO T 164 must be within  $\pm 2.00$  percent of the average asphalt binder content reported on page 4 of your Contractor Hot Mix Asphalt Design Data form. If a new processed RAP stockpile is required, the average binder content of the new processed RAP stockpile must be within  $\pm 2.00$  percent of the average binder reported on page 4 of your Contractor Hot Mix Asphalt Design Data form.

The combined RAP sample when tested under AASHTO T 209 must be within  $\pm 0.06$  of the average maximum specific gravity reported on page 4 of your Contractor Hot Mix Asphalt Design Data form.

During Type A HMA production, sample RAP twice daily and perform QC testing for:

1. Aggregate gradation at least once a day under California Test 384
2. Moisture content at least twice a day

**39-2.02A(4)(b)(iv)–39-2.02A(4)(b)(viii) Reserved**

**39-2.02A(4)(b)(ix) Type A Hot Mix Asphalt Production**

Test the quality characteristics of Type A HMA under the test methods and frequencies shown in the following table:

**Type A HMA Production Testing Frequencies**

Quality characteristic	Test method	Minimum testing frequency
Asphalt binder content	AASHTO T 308, Method A	1 per 750 tons and any remaining part
HMA moisture content	AASHTO T 329	1 per 2,500 tons but not less than 1 per paving day
Air voids content	AASHTO T 269	1 per 4,000 tons or 2 every 5 paving days, whichever is greater
Voids in mineral aggregate	SP-2 Asphalt Mixture Volumetrics	1 per 10,000 tons or 2 per project whichever is greater
Dust proportion	SP-2 Asphalt Mixture Volumetrics	
Density of core	California Test 375	2 per paving day
Nuclear gauge density	California Test 375	3 per 250 tons or 3 per paving day, whichever is greater
Hamburg wheel track	AASHTO T 324 (Modified)	1 per 10,000 tons or 1 per project, whichever is greater
Moisture susceptibility	AASHTO T 283	

**39-2.02A(4)(c)–39-2.02A(4)(d) Reserved**

**39-2.02A(4)(e) Department Acceptance**

The Department accepts Type A HMA based on compliance with:

1. Aggregate quality requirements shown in the following table:



**Aggregate Quality**

Quality characteristic	Test method	Requirement
Aggregate gradation <sup>a</sup>	AASHTO T 27	JMF ± Tolerance
Percent of crushed particles	AASHTO T 335	95
Coarse aggregate (min, %)		
One-fractured face		90
Two-fractured faces		
Fine aggregate (min, %)		
(Passing No. 4 sieve		
and retained on No. 8 sieve.)		
One-fractured face		70
Los Angeles Rattler (max, %)	AASHTO T 96	12
Loss at 100 Rev.		
Loss at 500 Rev.		40
Sand equivalent (min.) <sup>b, c</sup>	AASHTO T 176	47
Flat and elongated particles (max, % by weight at 5:1)	ASTM D4791	10
Fine aggregate angularity (min, %) <sup>d</sup>	AASHTO T 304, Method A	45

<sup>a</sup>The Engineer determines combined aggregate gradations containing RAP under California Test 384.

<sup>b</sup>Reported value must be the average of 3 tests from a single sample.

<sup>c</sup>Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, "Manual Shaker," 7.1.2, "Alternate Method No. 2," and 8.4.3, "Hand Method," do not apply. Prepare the stock solution as specified in section 4.8.1, "Stock solution with formaldehyde," except omit the addition of formaldehyde.

<sup>d</sup>The Engineer waives this specification if HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

2. If RAP is used, RAP quality requirements shown in the following table:

**Reclaimed Asphalt Pavement Quality**

Quality characteristic	Test method	Requirement
Binder content (% within the average value reported)	AASHTO T 164	±2.00
Specific gravity (within the average value reported)	AASHTO T 209	±0.06

3. In place Type A HMA quality requirements shown in the following table:

**Type A HMA Acceptance In Place**

Quality characteristic	Test method	Requirement
Asphalt binder content (%)	AASHTO T 308 Method A	JMF -0.30, +0.50
HMA moisture content (max, %)	AASHTO T 329	1.00
Air voids content at N <sub>design</sub> (%) <sup>a, b</sup>	AASHTO T 269	4.0 ± 1.5 (5.0 ± 1.5 for 1-inch aggregate)
Voids in mineral aggregate on laboratory-produced HMA (min, %) <sup>d</sup> Gradation: No. 4 3/8-inch 1/2-inch 3/4-inch 1-inch with NMAS = 1-inch with NMAS = 3/4-inch	SP-2 Asphalt Mixture Volumetrics	16.5–19.5 15.5–18.5 14.5–17.5 13.5–16.5  13.5–16.5 14.5–17.5
Voids in mineral aggregate on plant-produced HMA (min, %) <sup>a</sup> Gradation: No. 4 3/8-inch 1/2-inch 3/4-inch 1-inch with NMAS = 1-inch with NMAS = 3/4-inch	SP-2 Asphalt Mixture Volumetrics <sup>c</sup>	15.5–18.5 14.5–17.5 13.5–16.5 12.5–15.5  12.5–15.5 13.5–16.5
Dust proportion	SP-2 Asphalt Mixture Volumetrics	0.6–1.3 <sup>g</sup>
Density of core (% of max theoretical density) <sup>e, f</sup>	California Test 375	91.0–97.0
Hamburg wheel track (min number of passes at 0.5-inch rut depth) Binder grade: PG 58 PG 64 PG 70 PG 76 or higher	AASHTO T 324 (Modified)	10,000 15,000 20,000 25,000
Hamburg wheel track (min number of passes at inflection point) Binder grade: PG 58 PG 64 PG 70 PG 76 or higher	AASHTO T 324 (Modified)	10,000 10,000 12,500 15,000
Moisture susceptibility (min, psi, dry strength)	AASHTO T 283	100
Moisture susceptibility (min, psi, wet strength)	AASHTO T 283	70

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<sup>a</sup>Prepare 3 briquettes. Report the average of 3 tests.

<sup>b</sup>The Engineer determines the bulk specific gravity of each lab-compacted briquette under AASHTO T 275, Method A, and theoretical maximum specific gravity under AASHTO T 209, Method A.

<sup>c</sup>Determine bulk specific gravity under AASHTO T 275, Method A.

<sup>d</sup>The Engineer determines the laboratory-prepared Type A HMA value for only mix design verification.

<sup>e</sup>The Engineer determines percent of theoretical maximum density under California Test 375 except the Engineer uses:

1. AASHTO T 275 to determine in-place density of each density core
2. AASHTO T 209, Method A to determine theoretical maximum density instead of calculating test maximum density

<sup>f</sup>The Engineer determines theoretical maximum density under AASHTO T 209, Method A, at the frequency specified in California Test 375, part 5, section D.

<sup>g</sup>For lime-treated aggregates, the dust proportion requirement is 0.6–1.5.

### **39-2.02B Materials**

#### **39-2.02B(1) General**

Reserved

### 39-2.02B(2) Type A Hot Mix Asphalt Mix Design

The mix design for Type A HMA must comply with the requirements shown in the following table:

**Type A HMA Mix Design Requirements**

Quality characteristic	Test method	Requirement
Air voids content (%)	AASHTO T 269 <sup>a</sup>	N <sub>initial</sub> > 8.0 N <sub>design</sub> = 4.0 (N <sub>design</sub> = 5.0 for 1-inch aggregate) N <sub>max</sub> > 2.0
Gyrations compaction (no. of gyrations)	AASHTO T 312	N <sub>initial</sub> = 8 N <sub>design</sub> = 85.0 N <sub>max</sub> = 130
Voids in mineral aggregate (min, %) <sup>b</sup> Gradation: No. 4 3/8-inch 1/2-inch 3/4-inch 1-inch with NMAS = 1-inch with NMAS = 3/4-inch	SP-2 Asphalt Mixture Volumetrics	16.5–19.5 15.5–18.5 14.5–17.5 13.5–16.5 13.5–16.5 14.5–17.5
Dust proportion	SP-2 Asphalt Mixture Volumetrics	0.6–1.3
Hamburg wheel track (min number of passes at 0.5-inch rut depth) Binder grade: PG 58 PG 64 PG 70 PG 76 or higher	AASHTO T 324 (Modified) <sup>c</sup>	10,000 15,000 20,000 25,000
Hamburg wheel track (min number of passes at the inflection point) Binder grade: PG 58 PG 64 PG 70 PG 76 or higher	AASHTO T 324 (Modified) <sup>c</sup>	10,000 10,000 12,500 15,000
Moisture susceptibility, dry strength (min, psi)	AASHTO T 283 <sup>c</sup>	100
Moisture susceptibility, wet strength (min, psi)	AASHTO T 283 <sup>c, d</sup>	70

<sup>a</sup>Calculate the air voids content of each specimen using AASHTO T 275, Method A, to determine bulk specific gravity. Use AASHTO T 209, Method A, to determine theoretical maximum specific gravity. Use a digital manometer and pycnometer when performing AASHTO T 209.

<sup>b</sup>Measure bulk specific gravity using AASHTO T 275, Method A.

<sup>c</sup>Test plant-produced Type A HMA.

<sup>d</sup>Freeze thaw required.

For Type A HMA mixtures using RAP, the maximum allowed binder replacement is 25.0 percent in the upper 0.2 foot exclusive of OGFC and 40.0 percent below. The binder replacement is calculated as a percentage of the approved JMF target asphalt binder content.

For Type A HMA with a binder replacement percent less than or equal to 25 percent of your specified OBC, you may request that the performance graded asphalt binder grade with upper and lower temperature classifications be reduced by 6 degrees C from the specified grade.

For Type A HMA with a binder replacement greater than 25 percent of your specified OBC and less than or equal to 40 percent of OBC, you must use a performance graded asphalt binder grade with upper and lower temperature classifications reduced by 6 degrees C from the specified grade.

**39-2.02B(3) Asphalt Binder**

Reserved

**39-2.02B(4) Aggregates**

**39-2.02B(4)(a) General**

Before the addition of asphalt binder and lime treatment, the aggregates must comply with the requirements shown in the following table:

<b>Aggregate Quality</b>		
Quality characteristic	Test method	Requirement
Percent of crushed particles: Coarse aggregate (min, %) One-fractured face Two-fractured faces Fine aggregate (min, %) (Passing No. 4 sieve and retained on No. 8 sieve.) One-fractured face	AASHTO T 335	95 90  70
Los Angeles Rattler (max, %) Loss at 100 Rev. Loss at 500 Rev.	AASHTO T 96	12 40
Sand equivalent (min) <sup>a</sup>	AASHTO T 176	47
Flat and elongated particles (max, % by weight at 5:1)	ASTM D4791	10
Fine aggregate angularity (min, %) <sup>b</sup>	AASHTO T 304, Method A	45

<sup>a</sup>The reported value must be the average of 3 tests from a single sample. Use of a sand reading indicator is required as shown in AASHTO T 176, Figure 1. Sections 4.7, "Manual Shaker," 7.1.2, "Alternate Method No. 2," and 8.4.3, "Hand Method," do not apply. Prepare the stock solution as specified in section 4.8.1, "Stock solution with formaldehyde," except omit the addition of formaldehyde.

<sup>b</sup>The Engineer waives this specification if the Type A HMA contains 10 percent or less of nonmanufactured sand by weight of total aggregate, except if your JMF fails verification. Manufactured sand is fine aggregate produced by crushing rock or gravel.

**39-2.02B(4)(b) Aggregate Gradations**

The aggregate gradations for Type A HMA must comply with the requirements shown in the following table:

<b>Aggregate Gradation Requirements</b>	
Type A HMA pavement thickness shown	Gradation
0.10 foot	3/8 inch
Greater than 0.10 to less than 0.20 foot	1/2 inch
0.20 to less than 0.25 foot	3/4 inch
0.25 foot or greater	3/4 inch or 1 inch

Aggregate gradation must be within the TV limits for the specified sieve size shown in the following tables:

**Aggregate Gradations for Type A HMA  
(Percentage Passing)**

**1 inch**

Sieve size	Target value limit	Allowable tolerance
1"	100	--
3/4"	88–93	TV ± 5
1/2"	72–85	TV ± 6
3/8"	55–70	TV ± 6
No. 4	35–52	TV ± 7
No. 8	22–40	TV ± 5
No. 30	8–24	TV ± 4
No. 50	5–18	TV ± 4
No. 200	3.0–7.0	TV ± 2.0

**3/4 inch**

Sieve size	Target value limit	Allowable tolerance
1"	100	--
3/4"	90–98	TV ± 5
1/2"	70–90	TV ± 6
No. 4	42–58	TV ± 5
No. 8	29–43	TV ± 5
No. 30	10–23	TV ± 4
No. 200	2.0–7.0	TV ± 2.0

**1/2 inch**

Sieve size	Target value limit	Allowable tolerance
3/4"	100	--
1/2"	95–98	TV ± 5
3/8"	72–95	TV ± 5
No. 4	52–69	TV ± 5
No. 8	35–55	TV ± 5
No. 30	15–30	TV ± 4
No. 200	2.0–8.0	TV ± 2.0

**3/8 inch**

Sieve size	Target value limit	Allowable tolerance
1/2"	100	--
3/8"	95–98	TV ± 5
No. 4	55–75	TV ± 5
No. 8	30–50	TV ± 5
No. 30	15–35	TV ± 5
No. 200	2.0–9.0	TV ± 2.0

**No. 4**

Sieve size	Target value limit	Allowable tolerance
3/8"	100	--
No. 4	95–98	TV ± 5
No. 8	70–80	TV ± 6
No. 30	34–45	TV ± 5
No. 200	2.0–12.0	TV ± 4.0

**39-2.02B(5) Reclaimed Asphalt Pavement**

You may substitute RAP for part of the virgin aggregate in a quantity up to 25 percent of the aggregate blend.

Provide enough space at your plant for complying with all RAP handling requirements. Provide a clean, graded base, well drained area for stockpiles.

If RAP is from multiple sources, blend the RAP thoroughly and completely before fractionating.

For RAP substitution greater than 15 percent of the aggregate blend, fractionate RAP stockpiles into 2 sizes, a coarse fraction RAP retained on 3/8-inch sieve and a fine fraction RAP passing 3/8-inch sieve. For RAP substitution of 15 percent of the aggregate blend or less, fractionation is not required.

The RAP fractionation must comply with the requirements shown in the following table:

**RAP Stockpile Fractionation Gradation Requirements**

Size	Test method	Requirement
Coarse (% passing the 1-inch sieve)	California Test 202 <sup>a</sup>	100
Fine (% passing the 3/8-inch sieve)	California Test 202 <sup>a</sup>	98–100

<sup>a</sup>Maximum mechanical shaking time is 10 minutes.

You may use the coarse fractionated stockpile, the fine fractionated stockpile, or a combination of the coarse and fine fractionated stockpiles.

Isolate the processed RAP stockpiles from other materials. Store processed RAP in conical or longitudinal stockpiles. Processed RAP must not be agglomerated or be allowed to congeal in large stockpiles.

**39-2.02B(6)–39-2.02B(10) Reserved**

**39-2.02B(11) Type A Hot Mix Asphalt Production**

If RAP is used, the asphalt plant must automatically adjust the virgin asphalt binder to account for RAP percentage and RAP binder.

During production, you may adjust hot- or cold-feed proportion controls for virgin aggregate and RAP. RAP must be within ±3 of RAP percentage described in your Contractor Job Mix Formula Proposal form without exceeding 25 percent.

**39-2.02C Construction**

Where the pavement thickness shown is greater than 0.30 foot, you may place Type A HMA in multiple lifts not less than 0.15 foot each. If placing Type A HMA in multiple lifts:

1. Aggregate gradation must comply with the requirements shown in the following table:

**Aggregate Gradation Requirements**

Type A HMA lift thickness	Gradation
0.15 to less than 0.20 foot	1/2 inch
0.20 foot to less than 0.25 foot	3/4 inch
0.25 foot or greater	3/4 inch or 1 inch

2. Apply a tack coat before placing a subsequent lift
3. The Engineer evaluates each HMA lift individually for compliance

Spread Type A HMA at the ambient air and surface temperatures shown in the following table:

**Minimum Ambient Air and Surface Temperatures**

Lift thickness (feet)	Ambient air (°F)		Surface (°F)	
	Unmodified asphalt binder	Modified asphalt binder	Unmodified asphalt binder	Modified asphalt binder
<0.15	55	50	60	55
≥0.15	45	45	50	50

For method compaction, the maximum lift thickness must be 0.25 foot.

For Type A HMA placed under method compaction, if the asphalt binder is:

1. Unmodified, complete:
  - 1.1. 1st coverage of breakdown compaction before the surface temperature drops below 250 degrees F
  - 1.2. Breakdown and intermediate compaction before the surface temperature drops below 190 degrees F
  - 1.3. Finish compaction before the surface temperature drops below 150 degrees F
2. Modified, complete:
  - 2.1. 1st coverage of breakdown compaction before the surface temperature drops below 240 degrees F
  - 2.2. Breakdown and intermediate compaction before the surface temperature drops below 180 degrees F
  - 2.3. Finish compaction before the surface temperature drops below 140 degrees F

You may cool Type A HMA with water when rolling activities are complete if authorized.

**39-2.02D Payment**

Not Used

**39-2.03 RUBBERIZED HOT MIX ASPHALT–GAP GRADED**

Not used.

**39-2.04 OPEN GRADED FRICTION COURSES**

Not used.

**39-2.05 BONDED WEARING COURSES**

Not used.

**39-2.06 HOT MIX ASPHALT ON BRIDGE DECKS**

Not used.

**39-2.07 MINOR HOT MIX ASPHALT**

Not used.

**39-2.08–39-2.10 RESERVED**

**39-3 EXISTING ASPHALT CONCRETE**

**39-3.01 GENERAL**

**39-3.01A General**

Section 39-3.01 includes general specifications for performing work on existing asphalt concrete facilities.

Work performed on existing asphalt concrete facilities must comply with section 15.

**39-3.01B Materials**

Not Used



### **39-3.01C Construction**

Before removing a portion of an asphalt concrete facility, make a 2-inch deep saw cut to a true line along the limits of the removal area.

### **39-3.01D Payment**

Not Used

## **39-3.02 REPLACE ASPHALT CONCRETE SURFACING**

### **39-3.02A General**

Section 39-3.02 includes specifications for replacing asphalt concrete surfacing **Error! Bookmark not defined.**

### **39-3.02B Materials**

HMA to be used for replacing asphalt concrete surfacing must comply with Type A HMA as specified in section 39-2.02.

The grade of asphalt binder must be PG 64-10 or PG 64-16.

Tack coat must comply with section 39-2.01B(10).

### **39-3.02C Construction**

Where replace asphalt concrete surfacing is shown, remove the full depth of the existing asphalt concrete surfacing and replace with HMA. The Engineer determines the exact limits of asphalt concrete surfacing to be replaced.

Replace asphalt concrete in a lane before the lane is specified to be opened to traffic.

Before removing asphalt concrete, outline the replacement area and cut neat lines with a saw or grind to full depth of the existing asphalt concrete. Do not damage asphalt concrete and base remaining in place.

If you excavate the base beyond the specified plane, replace it with HMA.

Do not use a material transfer vehicle for replacing asphalt concrete surfacing.

Before placing HMA, apply a tack coat as specified in section 39-2.01C(3)(f).

Place HMA using method compaction as specified in section 39-2.01C(2)(c).

### **39-3.02D Payment**

The payment quantity for replace asphalt concrete surfacing is the volume determined from the dimensions shown.

## **39-3.03 REMOVE ASPHALT CONCRETE DIKES**

Not Used

## **39-3.04 COLD PLANING ASPHALT CONCRETE PAVEMENT**

### **39-3.04A General**

Section 39-3.05 includes specifications for cold planing asphalt concrete pavement.

Cold planing asphalt concrete pavement includes the removal of pavement markers, traffic stripes, and pavement markings within the area of cold planing.

### **39-3.04B Materials**

HMA for temporary tapers must be of the same quality that is used for the HMA overlay or comply with the specifications for minor HMA in section 39-2.07.

### **39-3.04C Construction**

#### **39-3.04C(1) General**

Do not use a heating device to soften the pavement.

The cold planing machine must be:

1. Equipped with a cutter head width that matches the planing width unless a wider cutter head is authorized.
2. Equipped with automatic controls for the longitudinal grade and transverse slope of the cutter head and:
  - 2.1. If a ski device is used, it must be at least 30 feet long, rigid, and a 1-piece unit. The entire length must be used in activating the sensor.
  - 2.2. If referencing from existing pavement, the cold planing machine must be controlled by a self-contained grade reference system. The system must be used at or near the centerline of the roadway. On the adjacent pass with the cold planing machine, a joint-matching shoe may be used.
3. Equipped to effectively control dust generated by the planing operation
4. Operated such that no fumes or smoke is produced.

Replace broken, missing, or worn machine teeth.

If you do not complete placing the HMA surfacing before opening the area to traffic, you must:

1. Construct a temporary HMA taper to the level of the existing pavement.
2. Place HMA during the next work shift.
3. Submit a corrective action plan that shows you will complete cold planing and placement of HMA in the same work shift. Do not restart cold planing activities until the corrective action plan is authorized.

#### **39-3.04C(2) Grade Control and Surface Smoothness**

Install and maintain grade and transverse slope references.

The final cut must result in a neat and uniform surface.

The completed surface of the planed pavement must not vary more than 0.02 foot when measured with a 12-foot straightedge parallel with the centerline. With the straightedge at right angles to the centerline, the transverse slope of the planed surface must not vary more than 0.03 foot.

Where lanes are open to traffic, the drop-off of between adjacent lanes must not be more than 0.15 foot.

#### **39-3.04C(3) Planed Material**

Remove cold planed material concurrently with planing activities such that the removal does not lag more than 50 feet behind the planer.

#### **39-3.04C(4) Temporary HMA Tapers**

If a drop-off between the existing pavement and the planed area at transverse joints cannot be avoided before opening to traffic, construct a temporary HMA taper. The HMA temporary taper must be:

1. Placed to the level of the existing pavement and tapered on a slope of 30:1 (horizontal:vertical) or flatter to the level of the planed area
2. Compacted by any method that will produce a smooth riding surface

Completely remove temporary tapers before placing permanent surfacing.

#### **39-3.04D Payment**

See Specifications, Division IV, Item P-101, Surface Preparation.

### **39-3.05 REMOVE BASE AND SURFACING**

Not Used.

**39-3.06–39-3.08 RESERVED**

## Item P-620 Runway and Taxiway Marking

### DESCRIPTION

**620-1.1** This item shall consist of the preparation and painting of markings on the surface of taxiways, taxilanes, and aprons, in accordance with these specifications and at the locations shown on the plans, or as directed by the Engineer. The terms “paint” and “marking material” as well as “painting” and “application of markings” are interchangeable throughout this specification.

### MATERIALS

**620-2.1 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. Material shall not be loaded into the equipment until inspected by the Engineer.

**620-2.2 Marking materials.** Paint shall be waterborne and meet the requirements of Federal Specification TT-P-1952E, Type I or Type II. The non-volatile portion of the vehicle for all paint types shall be composed of a 100% acrylic polymer as determined by infrared spectral analysis. Paint shall be furnished in Yellow – 33538 or 33655 in accordance with Federal Standard No. 595.

**620-2.3 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.

Retroreflectivity shall be measured, at Contractor expense, by a portable retroreflectometer according to ASTM E1710 and the practices in ASTM D7585 shall be followed for taking retroreflectivity readings with a portable retroreflectometer and computing measurement averages. A van-mounted retroreflectometer may also be used. Initial readings should yield at least 600 mcd/m<sup>2</sup>/lux on white markings and at least 300 mcd/m<sup>2</sup>/lux on yellow markings at installation.

### CONSTRUCTION METHODS

**620-3.1 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 or meets the manufacturer’s recommendations. Markings shall not be applied when the pavement temperature is greater than 130°F. Markings shall not be applied when the wind speed exceeds 10 mph unless windscreens are used to shroud the material guns.

**620-3.2 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 or airless-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.

**620-3.3 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 waterblasting or by other methods as required to remove all contaminants without damage to the pavement surface. Use of any chemicals or impact abrasives during surface preparation shall be approved in advance by the Engineer. After the cleaning operations, sweeping, blowing, or rinsing with pressurized water shall be performed to ensure the surface is clean and free of grit or other debris left from the cleaning process. 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.

Prior to the initial application of markings, the Contractor shall certify in writing that the surface has been prepared in accordance with the paint manufacturer's requirements, that the application equipment is appropriate for the type of marking paint and that environmental conditions are appropriate for the material being applied. This certification along with a copy of the paint manufacturer's surface preparation and application requirements must be submitted and approved by the Engineer prior to the initial application of markings.

**620-3.4 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.

**620-3.5 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 spacing shall be within the following tolerances:

Dimension and Spacing	Tolerance
36 inch or less	±1/2 inch
greater than 36 inch 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 shown in Table 1. The addition of thinner will not be permitted. A period of *30 days* shall elapse between placement of a bituminous surface course or seal coat and application of the paint. *Follow manufacturer's recommendation on time between coats.*

Prior to the initial application of markings, the Contractor shall certify in writing that the surface has been prepared in accordance with the paint manufacturer's requirements, that the application equipment is appropriate for the marking paint and that environmental conditions are appropriate for the material being applied. This certification along with a copy of the paint manufacturer's application and surface preparation requirements must be submitted to the Engineer prior to the initial application of markings.

**620-3.6 Test strip.** *Deleted.*

**Table 1. Application Rates for Paint and Glass Beads**

Paint Type	Color	Paint Square feet per gallon (ft <sup>2</sup> /gal), maximum	Glass Beads, Type III Pounds per gallon of paint (lb/gal), minimum
Waterborne (Initial Coat)	Yellow	230	0
Waterborne (Final Coat)	Yellow	115	10

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 that is properly designed for attachment to the marking machine and suitable for dispensing glass beads. Glass beads shall be applied at the rate 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. Different bead types shall not be mixed. Regular monitoring of glass bead embedment should be performed.

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.

**620-3.7 Application--preformed thermoplastic airport pavement markings.** *Deleted.*

**620-3.8 Protection and cleanup.** After application of the markings, all markings shall be protected from damage until dry. All surfaces shall be protected from excess moisture and/or rain and from disfiguration by spatter, splashes, spillage, or drippings. The Contractor shall remove from the work area 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**

**620-4.1** The quantity of pavement markings to be paid for shall be the number of square feet of painting, as designated by color, *including application of reflective media as required*, performed in accordance with the specifications and accepted by the Engineer.

#### **BASIS OF PAYMENT**

**620-5.1** Payment shall be made at the respective contract price per square foot. This price shall be full compensation for application of multiple coats and glass beads and for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

*Item P-620-5a Pavement Marking Including Reflective Media, White*

*Item P-620-5b Pavement Marking including Reflective Media, Yellow*

#### **TESTING REQUIREMENTS**

ASTM C371            Standard Test Method for Wire-Cloth Sieve Analysis of Nonplastic Ceramic Powders

ASTM D92	Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester
ASTM D711	Standard Test Method for No-Pick-Up Time of Traffic Paint
ASTM D968	Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D1652	Standard Test Method for Epoxy Content of Epoxy Resins
ASTM D2074	Standard Test Method for Total, Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method
ASTM D2240	Standard Test Method for Rubber Property - Durometer Hardness
ASTM D7585	Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments
ASTM E1710	Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer
ASTM E2302	Standard Test Method for Measurement of the Luminance Coefficient Under Diffuse Illumination of Pavement Marking Materials Using a Portable Reflectometer
ASTM G154	Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

#### **MATERIAL REQUIREMENTS**

ASTM D476	Standard Classification for Dry Pigmentary Titanium Dioxide Products
40 CFR Part 60, Appendix A-7, Method 24	Determination of volatile matter content, water content, density, volume solids, and weight solids of surface coatings
29 CFR Part 1910.1200 Hazard Communication	
FED SPEC TT-B-1325D	Beads (Glass Spheres) Retro-Reflective
American Association of State Highway and Transportation Officials (AASHTO) M247	Standard Specification for Glass Beads Used in Pavement Markings
FED SPEC TT-P-1952E	Paint, Traffic and Airfield Marking, Waterborne
Commercial Item Description A-A-2886B	Paint, Traffic, Solvent Based
FED STD 595	Colors used in Government Procurement
AC 150/5340-1	Standards for Airport Markings

**END OF ITEM P-620**

# **APPENDIX 1**

## **Construction Safety and Phasing Plan**



# **CHIRIACO SUMMIT AIRPORT**



## **CONSTRUCTION SAFETY AND PHASING PLAN**

**Runway Paving and Grading**

**CAAP No. : RIV-4-14-1**

Prepared by



**March 16, 2016**

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*SUPPLEMENTS TO THIS CSPP:*

*Supplement A – Plan Sheets*

*Supplement B – Safety Plan Compliance Document, Example*

*Supplement C – Daily Safety Inspection Checklist*

*Supplement D – Definition of Terms*

## **I. OVERVIEW**

This document presents the Construction Safety and Phasing Plan (CSPP) for the proposed improvements for the 2" runway overlay project at the Chiriaco Summit Airport (Airport), being performed under the California Department of Transportation (Caltrans), Division of Aeronautics, California Aid to Airports Program (CAAP) Grant No.RIV-4-14-1. The anticipated construction duration is from July 2016 through August 2016. Specifically, the Project scope includes the following elements:

- **Pavement Marking Removal**
- **Surface Preparation**
- **Crack Repair Procedures**
- **Overlay of Runway 6-24 (50'x4000')**
- **Application of Pavement Markings**

The objective of this CSPP is to provide a general outline of the construction safety and phasing provisions for working in or near the Air Operations Area (AOA) contained in the Contract Documents (Project Plans and Specifications), and to explain how those provisions will be implemented during construction.

## **II. PURPOSE**

The CSPP provides single source procedural information for all key Project personnel to use during construction, and defines the specific responsibilities of the Airport Operator, the Contractor, Airport users/tenants, and the Project Engineer. The Federal Aviation Administration's (FAA) Safety and Phasing Plan Checklist was utilized in the preparation of this CSPP, which includes (but is not limited to) provisions for Airport safety and security, operational limitations on construction activities, identifying potential hazards and the impacts those hazards may have on airfield and construction activities, and construction phasing requirements to minimize impact on airfield operations.

Requirements for maintaining operational safety during construction are in conformance with FAA Advisory Circular 150/5370-2F, "*Operational Safety on Airports During Construction.*" The Project specific safety and phasing provisions for the Project elements are shown on Plan Sheets G-021 and G-081, as well as detailed in the Project Specifications. Copies of the Plan Sheets are attached to this report as *Supplement A*.

## **III. CONSTRUCTION SAFETY AND PHASING RESPONSIBILITIES**

### **A. AIRPORT OPERATOR**

The Airport Operator is responsible for operational safety on the Airport at all times. The **County of Riverside, Economic Development Agency, Division of Aviation** (COUNTY) is the Airport Operator. The COUNTY will issue Notice to Airmen (NOTAMS) whenever construction activities occur in the AOA. COUNTY staff will provide oversight of all construction activities and coordinate those activities with Airport users (pilots). The COUNTY will hold weekly construction progress and safety meetings. During those meetings, operational safety will be reviewed and an action plan will be developed as needed to address any discrepancies in safety that need to be corrected. The

COUNTY will require the Contractor to submit a Safety Plan Compliance Document (SPCD) which details the Contractor's compliance with the CSPP. COUNTY and Caltrans approval of the SPCD will be required prior to issuance of the Notice to Proceed with Construction.

**B. CONSTRUCTION CONTRACTOR**

The Contractor will be determined by a competitive bidding process. The Contractor's responsibilities for safety and phasing are detailed and defined in the Contract Documents. The Contractor will be required to attend weekly progress and safety meetings and to correct any discrepancies found in safety. The Contractor is required to submit a completed SPCD to the COUNTY for approval by the COUNTY and Caltrans before the Notice to Proceed for Construction can be issued. A sample SPCD is included as *Supplement B*.

**C. AIRPORT USERS AND TENANTS**

The COUNTY will notify Airport users and local residents of all pending construction activities that impact them and advise the users of planned pavement closures and other activities in the AOA that will affect aircraft/Airport operations. Users and local residents will be permitted to attend weekly construction progress and safety meetings when appropriate.

**D. PROJECT ENGINEER**

As part of the Project construction management, observation, and quality assurance process, the Project Engineer will monitor construction safety on a daily basis, utilizing the "*Construction Project Daily Safety Inspection Checklist*" (see *Supplement C*) to ensure an appropriate level of priority is given to safety. Any discrepancies in safety will be immediately brought to the attention of the Contractor and COUNTY for corrective action implementation.

**IV. CONSTRUCTION SAFETY AND PHASING**

**A. COORDINATION**

1. **Design Progress Meetings.** Predesign conferences were held during the design development (60%, 90%, and Final Bid Documents) phases. These meetings were held to help avoid possible conflicts between construction activities and the operation of the Airport.
2. **Prebid Conference.** A prebid conference will be held to help clarify and explain construction methods, procedures, and safety measures required by the Contract. The prebid conference will be held a minimum of 10 (ten) days prior to the bid opening date.
3. **Preconstruction Conference.** A preconstruction conference will be held as soon as practicable after the Contract has been awarded and before issuance of the Notice to Proceed. The preconstruction conference participants should include, but not be limited to, the COUNTY, Project Engineer, Airport management, testing laboratory representative, Contractor and subcontractor(s), Contractor's project superintendent, Contractor's project clerk, Airport users, utility companies, state, and local agencies affected by the proposed construction. The Contractor shall present and distribute copies of the proposed construction schedule at the preconstruction meeting. Five (5) copies of Contract Documents will be provided to the Contractor by the COUNTY.
4. **Badging Requirements.** There are no badging requirements for this airport project. The contractor will supply the COUNTY with the appropriate names for all staff both contractor's and his sub-contractors and the Project Engineer will monitor their access to the project site.

5. **Contractor Progress Meetings.** Contractor progress meetings will be held weekly for the duration of construction. Operational safety will be a standing agenda item for discussion during progress meetings throughout the Project. Date, time, and location of the progress meetings will be determined at the preconstruction meeting.
6. **Scope or Schedule Changes.** Scope or schedule changes for the Project may necessitate revisions to the CSPP and require review and approval by the COUNTY and Caltrans.
7. **FAA Air Traffic Organization (ATO) Coordination.** *Chiriaco Summit Airport* currently has no facilities maintained by the FAA ATO. This Project will not require shutdowns and/or restarts of any FAA-maintained NAVAIDS. It will not be necessary for the FAA ATO to take part in the coordination meetings and be kept current on the construction schedule.

**B. PHASING AND TIME LIMITATIONS**

The Project has been divided into two Elements: 1) Mobilization and 2) Construction. The Construction Element has been divided into phases to separate the construction areas and define the sequence of the work associated with the Project. A separate Notice to Proceed shall be issued for Mobilization Element and the Construction Element. The Notice to Proceed for the Construction Element will not be issued until the Mobilization Element is complete and the SPCD is approved. The work efforts and affected airfield areas within the AOA are detailed below. The Mobilization Element shall be completed within twenty (20) working days and the Construction Element (Phases 1-Construction, Phase 2 – Final Pavement Markings) shall be completed within fifteen (15) working days. If the Contractor fails to meet any of these time limitations, liquidated damages will be assessed as described in Division III, Miscellaneous Provisions Section 100-8 of the Project Specifications.

**1. Element 1 – Mobilization. (20 working days)**

During this Element of the Project, no work shall be conducted that in any way restricts Airport operations. Mobilization work shall include, but not be limited to, the following:

- Processing of required submittals, including the Contractor’s work schedule.
- Preparation and submission of the SPCD.
- All prequalification testing, review, and approval.
- Mix design preparation, review, and approval.
- Airfield Safety Devices delivered to site (construction flags, low profile barricades, airport radios, runway closure markers).
- All miscellaneous Mobilization efforts required to commence construction.
- Materials and equipment delivered to site, as applicable.
- Contractor staging area setup and utility connections.

All preliminary work required to pursue construction to completion shall be finalized during the Mobilization Element to minimize delays during construction.

**2. Element 2 – Construction. (15 working days)**

Phasing Limitations. The following phasing restrictions apply:

- The runway shall be closed for the duration of the Phase 1 and Phase 2 construction process.

- After work is complete in Phase 1 construction, the runway will be open to traffic.
  - After the new pavement work has cured for 30 calendar days, a separate notice to proceed with Phase 2 – Final Pavement Markings will be issued by the COUNTY.
  - Prior to reopening airfield pavements to traffic, the areas must be safety area compliant per Section IV.Q “Protection of Runway and Taxiway Critical Areas” for all phases.
- a) **Phase 1 –Airport Runway Closure Periods (14 working days).** Phase 1 shall include the pavement marking removal, surface preparation for crack seals and 2-inch overlay, the placement of the 2-inch overlay, and the first application of runway pavement markings.

Phase 1 Summary

- Scope of Work – Work within the runway safety areas.
- Area closed to aircraft operations – Airport runway and taxiway.
- Duration of closure – fourteen (14) working days.
- Alternate taxi route – Not Applicable.
- Emergency access routes – Not required due to runway closure.
- Construction staging area – Material and equipment storage as shown per Plan Sheet G-021 and G-081.
- Construction access and haul route – per plan sheet detail shown on page G-021 and G-081.
- Impacts to NAVAIDs – None, there are no NAVAIDs.
- Lighting and marking changes – None, there are no lights.
- Required hazard marking and lighting – Lighted runway closure marker and flashing amber lights and/or flags on equipment and vehicles.
- Lead times for required notification – Two (2) working days.

Additional Phase 1 Notes.

- See Phasing Limitations above.

- b) **Phase 2 – Airport Runway Closure Periods (1 working day).** Phase 2 shall consist of the final application of pavement markings.

Phase 2 Summary

- Scope of Work – Work within the runway safety areas.
- Area closed to aircraft operations – Airport runway and taxiway.
- Duration of closure – one (1) working day.
- Alternate taxi route – Not Applicable.
- Emergency access routes – Not required due to runway closure.
- Construction staging area – Material and equipment storage as shown per Plan Sheet G-021 and G-081.
- Construction access and haul route – per plan sheet detail shown on page G-021 and G-081.
- Impacts to NAVAIDs – None, there are no NAVAIDs.
- Lighting and marking changes – None, there are no lights.
- Required hazard marking and lighting – Lighted runway closure marker and flashing amber lights and/or flags on equipment and vehicles.
- Lead times for required notification – Five (5) working days.

Additional Phase 2 Notes.

- See Phasing Limitations above.

3. **Construction Safety and Phasing Plan Sheets.** Drawings specifically indicating operational safety procedures and methods in affected areas have been developed for each construction phase and work area. These Drawings are included in the Contract Drawing Bid Package (Plan Sheets G-021 and G-081).

**C. AREAS AND OPERATIONS AFFECTED BY CONSTRUCTION**

1. **Runways.** The only runway on the airport will be closed for the duration of the construction.
2. **Taxiways.** There is only one taxiway and there are no based aircraft so there will be no active taxiway requirements. The one taxiway will be closed.

**D. NAVAID PROTECTION**

1. **Localizer.** Does not apply. This airport has no NAVAIDS.
2. **Glide Slope.** Does not apply. This airport has no NAVAIDS.
3. **VOR/DME.** Does not apply. This airport has no NAVAIDS.
4. **NDB.** Does not apply. This airport has no NAVAIDS..
5. **PAPI.** Does not apply. This airport has no NAVAIDS.

**E. CONTRACTOR ACCESS**

1. **Location of Stockpiled Construction Materials and Equipment.** Location of stockpiled materials and equipment storage shall be in the staging areas or as approved by the COUNTY. Stockpiling materials and equipment outside the staging areas and within the AOA will require prior approval from the COUNTY and will be subjected to additional limitations depending on the height(s). Stockpiled material shall meet the requirements of Section IV.F “*Wildlife Management*” to prevent the stockpile location(s) from becoming wildlife attractants.
2. **Vehicle and Pedestrian Operations.**
  - a) **Construction Site Parking.** Employees’ vehicles shall be parked in the staging areas designated on the Plans or outside the AOA. No employee vehicles will be allowed beyond the staging area limits. In areas where the staging area is adjacent to the perimeter security fence, all vehicles shall be positioned a minimum of 10 feet away from either side of the fence.
  - b) **Construction Equipment Parking.** All service and construction vehicles and/or equipment shall be parked in the staging area when not in use, and shall be positioned a minimum of 10 feet away from either side of a perimeter security fence. See Section IV.Q, “*Protection of Runway and Taxiway Critical Areas*” for further parking restrictions within safety areas and object free areas. Unless a complex setup procedure makes movement of specialized equipment infeasible, inactive equipment will not be allowed to park on a closed taxiway or runway. If it is necessary to leave specialized equipment on a closed taxiway at night, the COUNTY must approve the request and the equipment shall be lighted in accordance with Section IV.R, “*Other Limitations on Construction.*”

- c) **Access and Haul Roads.** The Contractor will be restricted to use the Project security gates and haul routes shown on the Drawings. Phase specific haul routes are shown on the Project Layout Plan. Right-of-way shall be given to all emergency vehicles sharing the haul routes with the Contractor. See paragraphs d) through h) for operating within the airfield environment requirements.
- d) **Marking and Lighting of Vehicles.** Only marked Contractor-owned/operated vehicles required for the proper execution of the work will be allowed in the work area. Motor vehicles shall be equipped with an omni-directional amber flashing light, head lights, tail lights, and flashers that shall be used between sunset and sunrise or when visibility is low. Vehicles within the airfield environment shall display company identification markings on both sides of the vehicle. Non-motorized equipment shall have reflective devices displayed on the front, back, and sides. Vehicles and equipment shall have an FAA orange and white checkered flag, 3 feet by 3 feet minimum, attached to a pole mounted on the rear bumper, and visible from 300 feet at all angles during daytime hours. All supervisory and survey personnel operating without a COUNTY escort within the airfield environment but outside the work area, shall have a company vehicle with an amber flashing light mounted on the roof of the cab and identifying markings visible from 300 feet mounted on both sides of the vehicle.
- e) **Training Requirement for Vehicle Drivers.** The project engineer will include vehicle operations as part of the weekly safety meeting and will establish acceptable vehicle operations for the contractor and sub-contractors to follow. Any person not following the acceptable vehicle operations will be removed from the project. Contractor will be held accountable for any damage to airport facilities and infrastructure as a result of vehicle operations.
- f) **Situational Awareness.** Yield the right-of-way to moving aircraft (whether under tow or their own power) and pedestrians. While driving or working within the airfield environment, personnel shall not wear any devices in or on their ears, other than those used to protect hearing or communicate company business. Yield right-of-way to emergency vehicles displaying rotating beacons (other than amber) and/or using sirens, and other audible emergency signals. In the event of an emergency, be prepared to move workers, vehicles, and equipment immediately at the direction of the COUNTY.

*Texting while driving anywhere on airport property is strictly prohibited.*

- g) **Two-Way Radio Communication Procedures.** All radio communications with the Common Traffic Advisory Frequency (CTAF) will be performed by COUNTY personnel and/or a trained Contractor-provided construction safety coordinator. Even though the runway is closed, all activities within runway object free areas will require two-way radio communication. The Contractor's on-site foremen/lead/superintendents shall carry (or have immediately available) a VHF aviation radio. Additionally, if a sweeper is being used in the movement area and a flagger is not coordinating his/her movements, the sweeper operator shall also carry a radio. Frequencies that will be used by COUNTY personnel are:
- CTAF – 122.9
- h) **Airport Security.** In areas of work activities, the Contractor shall maintain security against unauthorized access to the airfield area through the security gate(s). Gates shall be locked



or manned at all times. The gate shall be closed and locked when not in use. Where the Contractor's lock is used for access through COUNTY gates, the lock shall be marked to identify the ownership of the Contractor. Place the lock in series with existing locks. Failure to adhere to these requirements will result in the Contractor's lock being removed by the COUNTY.

**F. WILDLIFE MANAGEMENT**

Procedures to maintain existing wildlife mitigation devices, limit wildlife attractants, and notify COUNTY of wildlife encounters.

1. **Trash.** Receptacles shall be provided by the Contractor and equipped with metal, canvas, or plastic covers. Food scraps or other trash may not be disposed of on the ground and must be collected and placed in the covered receptacles so not to attract wildlife.
2. **Standing Water.** Staging areas, stockpile areas, and the work area shall be graded to drain to avoid attracting wildlife.
3. **Tall Grass and Seeds.** The use of low quality seed mixtures that contain seeds of plants (such as clover) that attract wildlife shall not be used. Grass and weeds shall be managed, or cut if necessary, within work areas to avoid attracting wildlife habitation.
4. **Fencing and Gates.** Fences and/or gates that are unmaintained and/or left open and unattended permit unwanted wildlife to enter inside the Airport perimeter fence. Refer to Section E.2.h for requirements of maintaining the secured area of the Airport. Contractor personnel shall immediately notify the COUNTY if any unwanted wildlife is observed inside the Airport perimeter fence.
5. **Disruption of Existing Wildlife Habitat.** Not applicable for this Project.

**G. FOREIGN OBJECT DEBRIS (FOD) MANAGEMENT AND DUST CONTROL**

The Contractor shall be required to ensure the airfield environment is kept continuously free of construction debris, equipment and/or materials that might endanger or be ingested by an aircraft. Contractor shall take extreme care to ensure that no work-related debris or other loose items are allowed to be blown by wind or aircraft engine blast. The Contractor shall be responsible for any resulting damage to aircraft engines and/or other property arising from failure to secure and/or protect debris, tools, supplies, or other loose items. Following the requirements described herein will help eliminate the potential for FOD. In areas that may result in the tracking of soil, sediments, or hazardous materials on the wheels of hauling equipment outside the area that are enclosed by erosion and silt/sediment control devices, the Contractor shall provide the means and methods to remove these materials prior to the vehicle exiting the controlled area. If water wash stations are used, the Contractor shall provide systems for the collection, treatment, and disposal of wheel wash water and accumulated sediment. Equipment operated on haul routes over existing pavements shall be kept free of material spillage and foreign matter at all times. Haul routes that are shared with aircraft operations shall be cleaned continuously with regenerative air vacuum sweepers, or other COUNTY approved methods.

Dust control shall be in conformance with Section 10, "Dust Control" of the State Standard Specifications 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 COUNTY, 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 COUNTY at the Contractor's expense.

**H. HAZARDOUS MATERIALS (HAZMAT) MANAGEMENT**

1. If shipments of hazardous material (including hazardous debris, contaminated soil or water, and hazardous waste) will be unloaded onto or loaded from COUNTY property, the Contractor shall have a qualified person available onsite when shipments are received or prepared to ship, who is current with U.S. Department of Transportation (DOT) approved training for the transportation of hazardous materials. Contractor shall properly characterize and manifest waste material leaving the COUNTY property for disposal. When the waste reaches its final destination, the owner or operator of the designated and permitted treatment, storage, and disposal (TSD) facility shall sign the manifest and return a copy to the COUNTY within 35 days to confirm receipt.
2. Minor spills can be controlled by the first responder at the discovery of the spill. Use absorbent materials on small spills rather than hosing down or burying the spill. First responder should contain the spread of the spill, recover spilled materials, clean the contaminated area, and properly dispose of contaminated materials. For minor spills, consult the products Material Safety Data Sheets (MSDS) for recommended actions for spills or container leaks. Additionally, MSDSs shall provide emergency phone numbers and occupational health hazard information.
3. Semi-significant spills can be controlled by the first responder along with the aid of other personnel such as laborers, the foreman, etc. Notify the COUNTY of semi-significant spills. Spills should be cleaned up immediately. Contain the spread of the spill and notify the Project foreman immediately. If the spill occurs on paved or impermeable surfaces, clean up by using dry methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely. If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil. If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.
4. Significant/Hazardous spills that cannot be controlled by personnel in the immediate vicinity must be reported to the local emergency response by dialing 911. In addition to 911, the Contractor shall notify the COUNTY, proper County officials, and the state Emergency Services Warning Center. The services of a Spills Contractor or a HAZMAT team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staff arrives at the jobsite. Other agencies that may need to be consulted include, but are not limited to, the Fire Department, the Public Works Department, the Highway Patrol, the City/County Police Department, and the Department of Toxic Substance.
5. Ensure that hazardous goods and material delivered to or from the construction site meet applicable DOT labeling and placarding requirements. Upon request from the COUNTY, supply MSDS for all hazardous material being delivered to the site.

6. The storage and shipment of hazardous waste shall also comply with the requirements of this section.
7. It is emphasized, however, that although spills resulting from incidents or accidents should be responded to, securing the well-being of people shall be the first priority.
8. Good housekeeping practices should be utilized during equipment fueling and maintenance operations. Inspect fueling equipment for leaks prior to dispensing. Fueling operations shall be continuously attended to while dispensing fuel. Fueling and maintenance operations shall not be performed within 50 feet of a storm drain, inlet, ditch, surface water, wetland, etc. to allow adequate time for containment in the event of a spill.

**I. NOTIFICATION OF CONSTRUCTION ACTIVITIES**

**1. Responsible Representatives / Points of Contact:**

Airports Staff Member	Title	Phone/Office	Cell
Daryl Shippy	County Airports Manager	(951) 955-9418	(951) 538-5046
Bob Casagrande	Mead & Hunt Project Eng.	(707) 284-8672	(707) 696-0371

Additional points of contact will be provided at the Preconstruction Meeting.

2. **Notices to Airmen (NOTAM).** Only the COUNTY may initiate or cancel a NOTAM on Airport conditions and is the only entity that can close or open a runway. Points of contact for issuing NOTAMS are as follows: Main Contact: Daryl Shippy
3. **Emergency Contact Information**
  - a) Emergency – Dial 911
  - b) Police Department – (760) 391-4057
  - c) Fire Department – (760) 347-0726
  - d) Hospital – (760) 347-6191
  - e) California Poison Center – 1-800-222-1222
4. **Coordination with Emergency Personnel.** The proposed Project does not deactivate waterlines or hydrants, does not block airfield emergency routes and is not anticipated to include the use of hazardous materials. Emergency personnel will be briefed by the COUNTY as to the construction schedule. If additional notification of emergency personnel is required, the Contractor shall contact the COUNTY.
5. **Notification of the FAA**
  - a) **Part 77.** The Project will not affect navigable airspace, but the project will change the runway end coordinate, therefore the COUNTY will be required to submit a FAA Form 7460-1, "Notice of Proposed Construction or Alteration" for that specific element. Any equipment (cranes, graders, other equipment) used by the Contractor that exceeds the height limitation in Section IV.R, "Other Limitations on Construction" must also have a Form 7460-1 airspace evaluation and determination prior to use.

- b) **Airport owned/FAA maintained NAVAIDS.** Does not apply. There are no NAVAIDS at this airport.
- c) **FAA owned NAVAIDS.** Does not apply. There are no NAVAIDS at this airport.

**J. INSPECTION REQUIREMENTS**

- 1. **Daily Inspections.** Inspections should be conducted by the Contractor at least daily, but more frequently if necessary, to ensure conformance with the CSPP. Special attention shall be given to areas used by construction traffic that will later be used by air traffic. These areas shall be maintained in accordance with Section IV.G, “*Foreign Object Debris Management.*” The COUNTY will have the final authority in determining if the area is suitable for aircraft use.
- 2. **Final Inspections.** A final inspection shall be conducted by the COUNTY prior to the commissioning of any construction-impacted areas open to air traffic. The COUNTY will have the final authority in determining if the area is suitable for aircraft use.

*Supplement C* contains a Daily Safety Inspection Checklist that may be used by the Contractor or COUNTY.

**K. UNDERGROUND UTILITIES AND NOTIFICATION RESPONSIBILITIES.**

Contractor must notify the Underground Service Alert (California [Central and Northern] and Nevada) by calling either 8-1-1 or 1-800-227-2600 ([www.usanorth.org](http://www.usanorth.org)), and any other owners of underground utilities within the construction area or within affected public rights-of-way or easements in advance of the commencement of excavation activities. Also, notify the COUNTY when the call is being initiated so the COUNTY can provide information on Airport utilities as well.

Contractor shall not cross electrical or communication cables unless protected by approved means. In the event of interruption to field-located utility services as a result of the work, promptly notify the COUNTY first, and then the proper authority. Cooperate with said authority in restoring service as promptly as possible. If required, the Contractor shall install suitable temporary service until permanent repair is completed.

**L. PENALTIES**

The Contractor is responsible for maintaining security during construction as detailed herein. 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 SPCD. Violations will be cause for the Project to be stopped and Project safety procedures evaluated. Contractor working days will continue to be charged, even if the COUNTY ceases construction operations. The COUNTY will decide if and when work will continue. Enforcement of these regulations will be by the COUNTY, Police, and/or Airport Operations Staff.

**M. SPECIAL CONDITIONS**

- 1. An aircraft in distress may require the Contractor to immediately move equipment away from an aircraft movement area. The COUNTY will notify the Contractor in the unlikely event of an aircraft in distress. The Contractor will be required to comply with all COUNTY instructions.
- 2. Various circumstances, such as an aircraft accident, security breach, or other unforeseen events may require suspension of the construction. The COUNTY will notify the Contractor

when suspension of the work will be required. See Section IV.I, “*Notification of Construction Activities*” for emergency contact information.

3. A VPD (vehicle / pedestrian deviation) is any entry or movement on the movement area by a vehicle or pedestrian that has not been authorized by the COUNTY. In the event of a VPD, the COUNTY reserves the right to suspend the work or any portion thereof and continue suspension until the completion of any investigation or evaluation by the COUNTY and full compliance with any corrective measures that the COUNTY may reasonably require. In addition, the COUNTY may require the Contractor to provide a written plan, satisfactory to the COUNTY, to demonstrate the Contractor’s ability to prevent future violations. See Section IV.E, “*Contractor Access*” for vehicle and pedestrian operations and two-way radio communication requirements.
4. During CAL FIRE, U.S. Forest Service, CHP, or any other emergency air operations that may require use of the airport, 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.

**N. RUNWAY AND TAXIWAY VISUAL AIDS**

1. **Temporary Signs or Visual NAVAIDS.** The nature of this construction Project and duration of closures will not require the addition of temporary lighting signs or visual NAVAIDS to be incorporated into this Project.
2. **Lighting.**
  - a) **Temporarily Closed Taxiways.** There are no taxiway lights.
  - b) **Temporarily Closed Runways.** There are no runway lights.
3. **Airfield Signs**
  - a) **Temporarily Closed Taxiways.** There are no taxiway airfield signs.
  - b) **Temporarily Closed Runways.** There are no runway airfield signs.

**O. MARKING AND SIGNS FOR ACCESS ROUTES**

1. The Contractor shall place traffic control signs and/or devices along the taxiway near the contractor’s access gate as appropriate, to advise the construction traffic of operations and hauling routes approved by the COUNTY. Signs and/or devices shall conform to the *California Manual on Uniform Traffic Control Devices (MUTCD), 2012 Edition*.

**P. HAZARD MARKING AND LIGHTING**

1. Before starting work, provide and have available all signs, barricades, and lights necessary for protection of the work. Install and maintain adequate warning signs and lighted barricades to protect property and personnel in the work area. Barricades shall be weighted or anchored to prevent overturning from wind or aircraft engine blast.
2. Barricades are not permitted in any active safety area. Barricades located within a runway or taxiway object free area and/or on aprons must be as shown on the plans. The Contractor

shall provide appropriate delineators to separate all construction/maintenance areas from the movement areas listed above.

3. Runway closure markers shall be placed on runways whenever runways are closed and remain operational for the duration of the closure. The COUNTY shall provide one set of trailer-mounted closure crosses for use by the Contractor. The Contractor shall be responsible for placing, fueling, lubricating, maintaining flashing lights, and removing closure crosses. The runway closure markers shall be returned to the COUNTY in the same condition as received.
4. The Contractor shall 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 COUNTY. Lighting shall be checked for proper operation at least once per day, preferably at dusk.
5. Open trenches, excavations, or obstructions not being actively worked shall be marked with lighted and weighted barricades that can be seen from a reasonable distance.
6. Stakes shall be used to delineate restricted areas as shown on the Drawings. Stakes shall be wooden lath with a minimum 1 foot buried in the ground and 3 feet exposed above ground. The top one foot above ground shall be painted fluorescent orange.

**Q. PROTECTION OF RUNWAY AND TAXIWAY CRITICAL AREAS**

1. **Runway Safety Area (RSA).** No construction may occur within the existing RSA while the runway is open for aircraft operations. Open trenches or excavations are not permitted within the RSA while the runway is open. If possible, backfill trenches before the runway is opened. If the runway must be opened before excavations are backfilled, cover the excavations appropriately. Covering for open trenches must be designed to allow the safe operation of the heaviest aircraft (12,500 pound single wheel loading) operating on the runway across the trench without damage to the aircraft. Contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the COUNTY, and light them with red lights during hours of restricted visibility or darkness. Soil erosion must be controlled to maintain RSA standards, that is, the RSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting the occasional passage of aircraft without causing structural damage to the aircraft. The ground surface within the RSA shall not have edges exceeding 3 inches or slopes greater than 5 percent unless the runway is closed. The dimensions for the Runway 6-24 RSA (A-1-VIS) is 60 feet each side of centerline and 240 feet beyond each runway end. The RSA is depicted on the work area Plans contained in *Supplement A*.
2. **Runway Object Free Area (ROFA).** Construction, including excavations, may be permitted within the ROFA. However, equipment must be removed from the ROFA when not in use and material should not be stockpiled in the ROFA if not necessary. Stockpiling material in the ROFA requires submittal of a 7460-1 form and COUNTY approval. The dimension for the Runway 6-24 ROFA is 200 feet each side of centerline and 240 feet beyond each runway end. The ROFA is depicted on the work area Plans contained in *Supplement A*.
3. **Taxiway Safety Area (TSA).** Does not apply. No construction is planned for any taxiways nor are any taxiways active during construction on this project.
4. **Taxiway/Taxilane Object Free Area (TOFA).** Does not apply. No construction is planned for any taxiways nor are any taxiways active during construction on this project.

5. **Obstacle Free Zone (OFZ).** Personnel, material, and/or equipment may not penetrate the OFZ while the runway is open to aircraft operations. The dimension for Runway 6-24 OFZ 125 feet each side of centerline and 200 feet beyond each runway end. The runway OFZ is depicted on the work area Plans contained in *Supplement A*.
6. **Runway Approach/Departure Surfaces.** When runway is open, all personnel, material, and/or equipment must remain clear of the threshold siting surfaces (approach and departure surfaces).
  - a) **Runway 6-24 Approach Surface.** Runway 6-24 is a visual runway. Using Table 3-2 and Figure 3-2 from AC150/5300-13A for Runway Category 2, the resulting approach surface begins at the runway threshold and consists of a trapezoid with the following dimensions:
    - Width at inner departure – 250 feet
    - Width at outer departure – 700 feet
    - Length of departure – 2,250feet
    - Approach slope – 20:1
  - b) **Runway 6-24 Departure Surface.** Runway 6-24 is a visual runway. Using Table 3-2 and Figure 3-4 from AC150/5300-13A for Runway Category 10, the resulting departure surface begins at the runway threshold and consists of a trapezoid with the following dimensions:
    - Width at inner departure (runway threshold) – 1000 feet
    - Width at outer departure – 6,466 feet
    - Length of departure – 10,200 feet
    - Departure slope – 40:1
  - c) **Affected Runway 6-24 Approach Surface.** The Runway 6-24 approach surface will be unaffected by construction.
  - d) **Affected Runway 6-24 Departure Surface.** The Runway 6-24 departure surface will be unaffected by construction.

**R. OTHER LIMITATIONS ON CONSTRUCTION**

**1. Prohibitions.**

- a) Open flame welding or torches are prohibited unless fire safety precautions are provided and the COUNTY has approved their use.
- b) Electrical blasting caps are prohibited on or within 1,000 feet of the Airport property.
- c) The use of flare pots are prohibited within the AOA.
- d) No smoking will be allowed within the airfield environment except as designated by the COUNTY.

**2. Restrictions**

**a) Equipment**

- 1) Construction equipment that extends 15 feet or more above ground level shall be cleared through the COUNTY prior to moving onto site. Equipment that may be lowered readily shall be lowered at night, during reduced daytime visibility, and during other periods of storage to comply with the 15-foot height limitation.

- 2) If directed by the COUNTY, construction equipment that cannot be lowered below the 15-foot height limitation shall be lighted at night and during periods of reduced daytime visibility. The light shall be mounted on the highest point of equipment; shall be omnidirectional; and shall consist of, at a minimum, one 100-watt bulb enclosed within an aviation red lens. Also, for daytime operations, mount an FAA-approved 3-foot square orange and white checkered flag at the highest point.
- 3) During daylight hours with severe visibility problems or heavy fog, cranes shall not operate. The COUNTY will determine when visibility problems exist and will coordinate and designate requirements for position and location of flag and light.

**S. SAFETY PLAN COMPLIANCE DOCUMENT (SPCD).**

The SPCD shall detail how the Contractor will comply with the CSPP. This shall include all Project-specific Construction Safety Plan details not included in the CSPP, including construction equipment heights, any applicable hazard management requirements, and contact information for the Contractor's safety management staff responsible for monitoring the CSPP and SPCD during construction. The SPCD shall be a supplement to, and enhancement of, the Project CSPP. See *Supplement B* for example of SPCD.

The SPCD must include a statement that the Contractor understands the operational safety requirements of the CSPP and an assertion that the Contractor will not deviate from the approved CSPP and SPCD without written approval from the COUNTY. Any construction operation, activity, or practice proposed by the Contractor that does not conform to the CSPP and SPCD will require a revision to those documents. The revised CSPP and SPCD must be submitted for review and approval prior to performing any activities that are not in compliance with a previously approved CSPP.

Copies of the approved CSPP and SPCD must be available on-site at all times. The Contractor shall ensure all construction personnel are familiar with safety procedures and regulations applicable to construction on the Airport. At least one of the Contractor's safety management staff must be on-site whenever active construction is ongoing to act as point of contact and immediate response coordinator to correct any construction-related activity that may adversely affect operational safety of the Airport.

**SUPPLEMENTS:**

- Supplement A – Plan Sheets*
- Supplement B – SPCD Example*
- Supplement C – Inspection Checklist*
- Supplement D – Definition of Terms*



# Supplement A

PLAN SHEETS

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**See Project Plan Set**

# Supplement B

## SAFETY PLAN COMPLIANCE DOCUMENT (SPCD)

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**CONTRACTOR'S  
SAFETY PLAN COMPLIANCE DOCUMENT (SPCD)  
(AC 150/5370-2F)**

**Project Information**

Airport and Sponsor: \_\_\_\_\_ CHIRIACO SUMMIT AIRPORT, COUNTY OF RIVERSIDE \_\_\_\_\_

Project ID: \_\_\_\_\_ CAAP No.: RIV-4-14-1 \_\_\_\_\_

Description of Project: \_\_\_\_\_ RUNWAY PAVING AND GRADING \_\_\_\_\_

Type of Work: \_\_\_\_\_ RUNWAY PAVEMENT CRACK FILL AND OVERLAY \_\_\_\_\_

Airport Operator Contact: \_\_\_\_\_ Daryl Shippy \_\_\_\_\_ Phone: \_\_\_\_\_ (951) 955-9148 \_\_\_\_\_

**Contractor's Information**

Prime Contractor: \_\_\_\_\_

Address: \_\_\_\_\_

Contractor Contact: \_\_\_\_\_ Phone: \_\_\_\_\_

**Contractor's Responsibility**

In accordance with Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5370-2F, *Operational Safety During Airport Construction*, a SPCD for a project must be submitted to the FAA and to the Airport Operator for review and approval prior to the issuance of a Notice-to-Proceed for Construction. The SPCD shall be prepared in a detailed written and graphical format that identifies the timing and methodology for the Contractor's compliance with the project's Construction Safety and Phasing Plan (CSPP).

**The Contractor shall comply with all provisions contained herein and provide the following project-specific complementary and supplemental information to the FAA-approved Construction Safety and Phasing Plan:**

1. Contractor shall have copies of the CSPP and SPCD available at all times for reference by the Airport Operator and its representatives, and by Contractor's and subcontractor's employees.

Location(s) of CSPP and SPCD: \_\_\_\_\_  
\_\_\_\_\_

2. Provide contact information for the person responsible for initiating and coordinating an immediate response to correct any construction-related activity that may adversely affect the operational safety of the Airport. Project will require 24-hour coverage.

Point of Contact: \_\_\_\_\_ Phone: \_\_\_\_\_

3. Provide list of Contractor's on-site employees responsible for monitoring compliance with the CSPP and SPCD whenever active construction is ongoing.

Contact Person: \_\_\_\_\_ Phone: \_\_\_\_\_

Contact Person: \_\_\_\_\_ Phone: \_\_\_\_\_

Contact Person: \_\_\_\_\_ Phone: \_\_\_\_\_

Contact Person: \_\_\_\_\_ Phone: \_\_\_\_\_

4. Contractor shall conduct inspections at least once daily, and more frequently if necessary to ensure construction personnel comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards. A Construction Project Daily Safety Inspection Checklist is attached.
5. Describe details of Contractor's plan to restrict movement of construction vehicles and personnel to permitted construction areas by flagging, barricading, erecting temporary fencing, or providing escorts, as appropriate and as specified in the CSPP. Include the appropriate plan sheets to identify timing and/or location of control measures: [**Contractor to insert detailed description.**]
6. Describe details of Contractor's plan to ensure that no employees of Contractor, subcontractors, suppliers, or other persons enter any part of the Air Operations Area (AOA) unless authorized. [**Contractor to insert detailed description.**]
7. Provide a description and schedule of anticipated operation for all Contractor equipment over 15 feet in height (e.g. cranes, concrete pumps, other similarly tall equipment) and heights of stockpiles and haul routes when different from what is shown on previously filed CSPP. [**Contractor to insert detailed equipment list/stockpile heights as applicable.**]

(As necessary, the Contractor must coordinate with the Airport Operator for the purpose of filing a supplemental submittal of FAA Form 7460-1 to the FAA for determination of whether or not an aeronautical study must be conducted prior to allowing tall equipment operations to begin.)

8. Provide a description of Contractor's plan to ensure that construction personnel are familiar with the safety procedures and regulations on the Airport, the CSPP, and the SPCD. [***Contractor to insert detailed description.***]

**SPCD Amendment**

The SPCD shall be amended when there is a construction practice proposed by the Contractor that does not conform to the CSPP and SPCD and may impact the Airport's operational safety. This will require a revision to the CSPP and SPCD and re-coordination with the Airport Operator and the FAA in advance.

**Statement of Certification**

I certify that we understand the operational safety requirements of the CSPP and assert that we will not deviate from the approved CSPP and SPCD unless written approval is granted by the Airport Operator and FAA.

Print Name: \_\_\_\_\_ Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

# Supplement C

## DAILY SAFETY INSPECTION CHECKLIST

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## CONSTRUCTION PROJECT DAILY SAFETY INSPECTION CHECKLIST

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. The list below is one tool that the airport operator or contractor may use to aid in identifying and correcting potentially hazardous conditions. It should be customized as appropriate for each project.

### Potentially Hazardous Conditions

Item	Action Required	or	None
Excavation adjacent to runways, taxiways, and aprons improperly backfilled.			<input type="checkbox"/>
Mounds of earth, construction materials, temporary structures, and other obstacles near any open runway, taxiway, or taxi lane; in the related Object Free area and aircraft approach or departure areas/zones; or obstructing any sign or marking.			<input type="checkbox"/>
Runway resurfacing projects resulting in lips exceeding 3 in (7.6 cm) from pavement edges and ends.			<input type="checkbox"/>
Heavy equipment (stationary or mobile) operating or idle near AOA, in runway approaches and departures areas, or in OFZ.			<input type="checkbox"/>
Equipment or material near NAV AIDs that may degrade or impair radiated signals and/or the monitoring of navigation and visual aids. Unauthorized or improper vehicle operations in localizer or glide slope critical areas, resulting in electronic interference and/or facility shutdown.			<input type="checkbox"/>
Tall and especially relatively low visibility units (that is, equipment with slim profiles) – cranes, drills, and similar objects – located in critical areas, such as OFZ and approach zones.			<input type="checkbox"/>
Improperly positioned or malfunctioning lights or unlighted airport hazards, such as holes or excavations, on any apron, open taxiway, or open taxi lane or in a related safety, approach, or departure area.			<input type="checkbox"/>
Obstacles, loose pavement, trash, and other debris on or near AOA. Construction debris (gravel, sand, mud, paving materials) 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.			<input type="checkbox"/>

Item	Action Required	or	None
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 create aviation hazards.			<input type="checkbox"/>
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 create aviation hazards.			<input type="checkbox"/>
Wildlife attractants – such as trash (food scraps not collected from construction personnel activity), grass seeds, tall grass, or standing water – on or near airports.			<input type="checkbox"/>
Obliterated or faded temporary markings on active operational areas.			<input type="checkbox"/>
Misleading or malfunctioning obstruction lights. Unlighted or unmarked obstructions in the approach to any open runway pose aviation hazards.			<input type="checkbox"/>
Failure to issue, update, or cancel NOT AMs about airport or runway closures or other construction related airport conditions.			<input type="checkbox"/>
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 navigation, visual, or approach aids; disruption of weather reporting services; and/or loss of communications.			<input type="checkbox"/>
Restrictions on ARFF access from fire stations to the runway / taxiway system or airport building.			<input type="checkbox"/>
Lack of radio communications with construction vehicles in airport movement areas.			<input type="checkbox"/>
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.			<input type="checkbox"/>
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.			<input type="checkbox"/>
Spillage from vehicles (gasoline, diesel fuel, oil) on active pavement areas, such as runways, taxiways, aprons, and airport roadways.			<input type="checkbox"/>



Item	Action Required	or	None
Failure to maintain drainage system integrity during construction (for example, no temporary drainage provided when working on a drainage system).			<input type="checkbox"/>
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.			<input type="checkbox"/>
Failure to control dust. Consider limiting the amount of area from which the contractor is allowed to strip turf.			<input type="checkbox"/>
Exposed wiring that creates an electrocution or fire ignition hazard. Identify and secure wiring, and place it in conduit or bury it.			<input type="checkbox"/>
Site burning, which can cause possible obscuration.			<input type="checkbox"/>
Construction work taking place outside designated work areas and out of phase.			<input type="checkbox"/>

# Supplement D

## DEFINITIONS OF TERMS

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## Definition of Terms

Term	Definition
7460-1	Notice Of Proposed Construction Or Alteration. For on-airport projects, the form submitted to the FAA regional 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, safe, efficient use, and preservation of the navigable airspace. (See guidance available on the FAA web site at <a href="http://www.faa.gov">oeaaa.faa.gov</a> .) The form may be downloaded at <a href="http://www.faa.gov/airports/resources/forms/">http://www.faa.gov/airports/resources/forms/</a> , or filed electronically at: <a href="https://oeaaa.faa.gov">https://oeaaa.faa.gov</a> .
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 The form may be downloaded at <a href="http://www.faa.gov/airports/resources/forms/">http://www.faa.gov/airports/resources/forms/</a> .
AC	Advisory Circular
ACRC	Aircraft Reference Code
ACSI	Airport Certification Safety Inspector
ADG	Airplane Design Group
AIP	Airport Improvement Program
ALECP	Airport Lighting Equipment Certification Program
ANG	Air National Guard
AOA	Air Operations Area. 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.
ARFF	Aircraft Rescue and Fire Fighting
ARP	FAA Office of Airports
ASDA	Accelerate-Stop Distance Available
ATCT	Airport Traffic Control Tower
ATIS	Automatic Terminal Information Service
ATO	Air Traffic Organization
Certificated Airport	An airport that has been issued an Airport Operating Certificate by the FAA under the authority of 14 CFR Part 139, Certification of Airports.
CFR	Code of Federal Regulations
Construction	The presence and movement of construction-related personnel, equipment, and materials in any location that could infringe upon the movement of aircraft.
CSPP	Construction Safety And Phasing Plan. The overall plan for safety and phasing of a construction project developed by the airport operator, or developed by the airport operator's consultant and approved by the airport operator. It is included in the invitation for bids and becomes part of the project specifications.

Term	Definition
CTAF	Common Traffic Advisory Frequency
Displaced Threshold	A threshold that is located at a point on the runway other than the designated beginning of the runway. The portion of pavement behind a displaced threshold is available for takeoffs in either direction or landing from the opposite direction.
DOT	Department of Transportation
EPA	Environmental Protection Agency
FOD	Foreign Object Debris
HAZMAT	Hazardous Materials
IFR	Instrument Flight Rules
ILS	Instrument Landing System
LDA	Landing Distance Available
LOC	Localizer antenna array
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 aprons and aircraft parking areas (reference 14 CFR Part 139).
MSDS	Material Safety Data Sheet
MUTCD	Manual on Uniform Traffic Control Devices
NAVAID	Navigation Aid
NAVAID Critical Area	An area of defined shape and size associated with a NAVAID that must remain clear and graded to avoid interference with the electronic signal.
Non-Movement Area	The area inside the airport security fence exclusive of the Movement Area. It is important to note that the non-movement area includes pavement traversed by aircraft.
NOTAM	Notices to Airmen
Obstruction	Any object/obstacle exceeding the obstruction standards specified by 14 CFR Part 77, subpart C.
OE / AAA	Obstruction Evaluation / Airport Airspace Analysis
OFA	Object Free Area. An area on the ground centered on the runway, taxiway, or taxi lane 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, for additional guidance on OFA standards and wingtip clearance criteria.)
OFZ	Obstacle Free Zone. The airspace below 150 ft (45 m) 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. The OFZ is subdivided as follows: Runway OFZ, Inner Approach OFZ, Inner Transitional OFZ, and Precision OFZ. Refer to AC 150/5300-13 for guidance on OFZ.
OSHA	Occupational Safety and Health Administration
P&R	Planning and Requirements Group

Term	Definition
PAPI	Precision Approach Path Indicators
PFC	Passenger Facility Charge
PLASI	Pulse Light Approach Slope Indicators
Project Proposal Summary	A clear and concise description of the proposed project or change that is the object of Safety Risk Management.
RE	Resident Engineer
REIL	Runway End Identifier Lights
RNAV	Area Navigation
ROFA	Runway Object Free Area
RSA	Runway Safety Area. 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.
SIDA	Security Identification Display Area
SMS	Safety Management System
SPCD	Safety Plan Compliance Document. Details developed and submitted by a contractor to the airport operator for approval providing details on how the performance of a construction project will comply with the CSPP.
SRM	Safety Risk Management
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.
TDG	Taxiway Design Group
Temporary	Any condition that is not intended to be permanent.
Temporary Runway End	The beginning of that portion of the runway available for landing and taking off in one direction, and for landing in the other direction. Note the difference from a displaced threshold.
Threshold	The beginning of that portion of the runway available for landing. In some instances, the landing threshold may be displaced.
TODA	Takeoff Distance Available
TOFA	Taxiway Object Free Area
TORA	Takeoff Run Available. The length of the runway less any length of runway unavailable and/or unsuitable for takeoff run computations. See AC 150/5300-13 for guidance on declared distances.
TSA	Taxiway Safety Area Transportation Security Administration
UNICOM	A radio communications system of a type used at small airports.
VASI	Visual Approach Slope Indicators

Term	Definition
VGSI	Visual Glide Slope Indicator. A device that provides a visual glide slope indicator to landing pilots. These systems include precision approach path indicators (PAPI), visual approach slope indicators (VASI), and pulse light approach slope indicators (PLASI).
VFR	Visual Flight Rules
VOR	VHF Omnidirectional Radio Range
VPD	Vehicle / Pedestrian Deviation