

**ATTACHMENT 3**  
**RENTAL OF BRIDGE REPAIR UNITS**  
**HMA S.50**  
**HMA S.375**

**Description:** Where reference is made to bituminous concrete, it shall also refer to hot-mix asphalt (“HMA”) mixtures using the Marshall or Superpave mix-design method.

**Materials:** The materials for the bituminous concrete mixture, sources of supply, formula for mix, tack coat, joint seal, mix tolerances, approval of mix formula, and the control of the mixture shall conform to the requirements in Section M.04 of the Material Requirements section in the Exhibit A, “Description of Goods and Services”.

**Recycle Option:** The Contractor has the option of recycling reclaimed asphalt pavement (“RAP”) or Crushed Recycled Container Glass (“CRCG”) in HMA mixtures in accordance with Section M.04. CRCG shall not be used in the final lift of the surface course.

**Construction Methods:** The methods employed in performing the work and all equipment, tools, machinery and plant used in handling material and executing any part of the work must be approved by the Client Agency Engineer prior to their use. If at any time these are unsatisfactory to the Client Agency Engineer, the Contractor shall change them, as the Client Agency Engineer requires.

1. **Material Documentation:** All vendors producing bituminous concrete must have their truck-weighing scales, storage scales, and mixing plant automated to provide a detailed ticket.

Delivery tickets must include the following information:

- a. Client Agency name printed on ticket.
- b. Name of producer, identification of plant, and specific storage bin (silo) if used.
- c. Date and time of day.
- d. Mixture Designation (If RAP is used, the plant printouts shall include RAP dry weight, percentage and daily moisture content.) Class 3 mixtures for machine-placed curbing must state "curb mix only".
- e. Net weight of mixture loaded into truck (When RAP is used, RAP moisture shall be excluded from mixture net weight).
- f. Gross weight (Either equal to the net weight plus the tare weight or the loaded scale weight).
- g. Project number, purchase order number, name of contractor (if contractor other than producer).
- h. Truck number for specific identification of truck.
- i. Individual aggregate, RAP, and virgin asphalt high/target/low weights shall be printed on batch plant tickets (For drum plants and silo loadings, the plant printouts shall be printed out at 5 minute intervals maintained by the vendor for a period of three years after the completion of the project).

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The Contractor must notify the Client Agency Engineer immediately if, during the production day, there is a malfunction of the weighing or recording system in the automated plant or truck-weighing scales. Manually written tickets containing all required information will be allowed for one hour, but for no longer, provided that each load is weighed on Client Agency -approved scales. At the Client Agency Engineer's sole discretion, trucks may be approved to leave the plant if a Client Agency inspector is present to monitor weighing. If such a malfunction is not fixed within forty-eight hours, mixture will not be approved to leave the plant until the system is fixed to the Client Agency Engineer's satisfaction. No damages will be considered should the Client Agency be unable to provide an inspector at the plant.

- 2. Transportation of Mixture:** Trucks with loads of bituminous concrete being delivered to Client Agency projects must not exceed the statutory or permitted load limits referred to as gross vehicle weight ("GVW"). The Contractor shall furnish a list of all vehicles and allowable weights transporting mixture.

The Client Agency reserves the right to check the gross and tare weight of any delivery truck. A variation of 0.4 percent or less in the gross or tare weight shown on the delivery ticket and the certified scale weight shall be considered evidence that the weight shown on the delivery ticket is correct. If the gross or tare weight varies from that shown on the delivery ticket by more than 0.4 percent, the Client Agency Engineer will recalculate the net weight. The Contractor shall take action to correct discrepancy to the satisfaction of the Client Agency Engineer.

If a truck delivers mixture to the project and the ticket indicates that the truck is overweight, the load will not be rejected but a "Measured Weight Adjustment" will be taken in accordance with Sub-article 4.06.04.

The mixture shall be transported from the mixing plant in trucks that have previously been cleaned of all foreign material and that have no gaps through which mixture might inadvertently escape. The use of kerosene, gasoline, fuel oil, or similar products for the coating of the inside of truck bodies is prohibited.

Truck body coating and cleaning agents must not have a deleterious effect on the transported mixture. When acceptable coating or agents are applied, truck bodies shall be raised immediately prior to loading to remove any excess agent in an environmentally acceptable manner. The Contractor shall take care in loading trucks uniformly so that segregation is minimized.

Loaded trucks shall be tightly covered with waterproof covers acceptable to the Client Agency Engineer. Mesh covers are prohibited. The front and rear of the cover must be fastened to minimize air infiltration. The Contractor shall assure that all trucks are in conformance with this specification. Trucks found not to be in conformance shall not be allowed to be loaded until re-inspected to the satisfaction of the Client Agency Engineer.

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- 3. Paving Equipment:** The Contractor shall have the necessary paving and compaction equipment at the project site to perform the work. All equipment shall be in good working order and any equipment that is worn, defective or inadequate for performance of the work shall be repaired or replaced by the Contractor to the satisfaction of the Client Agency Engineer. The use of solvents or fuel oil as a release agent on any paving equipment (i.e., rollers, pavers, transfer devices, etc.) is strictly prohibited.

Refueling of equipment is prohibited in any location on the paving project where fuel might come in contact with bituminous concrete mixtures already placed or to be placed. Solvents for use in cleaning mechanical equipment or hand tools shall be stored clear of areas paved or to be paved. Before any such equipment and tools are cleaned, they shall be moved off the paved or to be paved area; and they shall not be returned for use until after they have been allowed to dry.

Pavers: Each paver shall have a receiving hopper with sufficient capacity to provide for a uniform spreading operation and a distribution system that places the mix uniformly, without segregation. The paver shall be equipped with and use a vibratory screed system with heaters or burners. The screed system shall be capable of producing a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture. Pavers with extendible screed units as part of the system shall have auger extensions and tunnel extenders as necessary. Automatic screed controls for grade and slope shall be used at all times unless otherwise authorized by the Client Agency Engineer. The controls shall automatically adjust the screed to compensate for irregularities in the preceding course or existing base. The controls shall maintain the proper transverse slope and be readily adjustable, and shall operate from a fixed or moving reference such as a grade wire or floating beam.

Rollers: All rollers shall be self-propelled and designed for compaction of bituminous concrete.

Non-vibratory (static) rollers shall be steel wheel types. These rollers may also be of the type that can be used as vibratory rollers.

Pneumatic tire rollers shall be self-propelled and equipped with wide-tread compaction tires capable of exerting an average contact pressure from 60 to 90 pounds per square inch uniformly over the surface, adjusting ballast and tire inflation pressure as required. The Contractor shall furnish evidence regarding tire size; pressure and loading to confirm that the proper contact pressure is being developed and that the loading and contact pressure are uniform for all wheels.

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Lighting: For paving operations, which will be performed during hours of darkness, the paving equipment shall be equipped with lighting fixtures as described below, or with approved lighting fixtures of equivalent light output characteristics. A sufficient number of spare lamps shall be available on site as replacements in the event of failures. The Contractor shall provide brackets and hardware for mounting light fixtures and generators to suit the configuration of the rollers and pavers. Mounting brackets and hardware shall provide for secure connection of the fixtures, minimize vibration, and allow for adjustable positioning and aiming of the light fixtures. Lighting shall be aimed to maximize the illumination on each task and minimize glare to passing traffic. The Contractor shall provide generators on rollers and pavers of the type, size, and wattage, to adequately furnish 120 V AC electric power to operate the specified lighting equipment. A sufficient amount of fuel shall be available on site. There shall be switches to control the lights. Wiring shall be weatherproof and installed to all applicable codes. The minimum lighting requirements are:

**Paver Lighting**

<b>Fixture</b>	<b>Quantity</b>	<b>Remarks</b>
Type A	3	Mount over screed area
Type B (narrow) or Type C (spot)	2	Aim to auger and guideline
Type B (wide) or Type C (flood)	2	Aim 25 feet behind paving machine

**Roller Lighting**

<b>Fixture</b>	<b>Quantity</b>
Type B (wide)	2
Type B (narrow)	2
<b>OR</b>	
Type C (flood)	2
Type C (spot)	2

All fixtures shall be mounted above the roller. Aim floodlights and wide beam lights 50 feet in front of and behind roller; aim spotlights and narrow beam lights 100 feet in front of and behind roller.

Type A: Fluorescent fixture shall be heavy-duty industrial type. It shall be enclosed and gasketed to seal out dirt and dampness. It shall be UL listed as suitable for wet locations. The fixture shall contain two (2) 4-foot long lamps - Type "F48T12CWHO". The integral ballast shall be a high power factor, cold weather ballast, and 120 volts for 800 MA HO lamps. The housing shall be aluminum, and the lens shall be acrylic with the lens frame secured to the housing by hinging latches. The fixture shall be horizontal surface mounting, and be made for continuous row installation.

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Type B: The floodlight fixture shall be heavy-duty cast aluminum housing, full swivel and tilt mounting, tempered-glass lens, gasketed door, reflector to provide a wide distribution or narrow distribution as required, mogul lamp socket for 250 watt Metal Halide lamp, 120 volt integral ballast, suitable for wet locations.

Type C: The power beam holder shall have ribbed die cast aluminum housing and a clear tempered-glass lens to enclose the fixture. There shall be an arm fully adjustable for aiming, with a male-threaded mount with serrated teeth and lock nuts. There shall be a 120-volt heatproof socket with extended fixture wiring for an "Extended Mogul End Prong" lamp base. The fixture shall have gaskets, and shall be UL listed as suitable for wet locations. The lamps shall be 1000-watt quartz PAR64, both Q1000PAR64MFL (flood) and Q1000PARNSP (spot) will be required.

- 4. Transitions for Roadway Surface:** No transitions will be allowed. All areas where the wearing surface has been removed for patching operations shall submit mix designs and perform all QC testing at the plant during production for all contracts as specified in Section M.04 and as stated herein. The procedures stated in the "Materials Testing Manual" published by the Client Agency's Division of Materials Testing.

The quantity of tack coat used will not be measured for payment as it is considered included in the general cost of the work.

No payment will be made for any work related to the replacement or correction of defective pavement. Related work includes items such as the removal and replacement of bituminous concrete, maintenance and protection of traffic, density testing, pavement repairs, replacement of bridge joints, pavement markings and any other work that is deemed necessary by the Client Agency Engineer to provide an acceptable pavement.

- 5. Spreading and Finishing of Mixture:** Prior to the placement of the bituminous concrete, the underlying base course shall be brought to the plan grade and cross section within the allowable tolerance. Immediately before placing the mixture, the area to be surfaced shall be cleaned by sweeping or by other means acceptable to the Client Agency Engineer. The HMA mixture shall not be placed whenever the surface is wet or frozen. The temperature of the mix at time of placement must be between 265°F and 325°F.

Placement: The HMA mixture shall be placed and compacted to provide a smooth, dense surface with a uniform texture and no segregation at the designed thickness and dimensions indicated in the plans and specifications.

When unforeseen weather conditions prevent further placement of the mix, the Client Agency Engineer is not obligated to accept or place the bituminous concrete mixture that is in transit from the plant.

The Contractor shall inspect the newly placed pavement for defects in the mixture or placement before rolling is started. Any deviation from standard crown or section shall be

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immediately remedied by placing additional mixture or removing surplus mixture. Such defects shall be corrected to the satisfaction of the Client Agency Engineer.

Where it is impractical due to physical limitations to operate the paving equipment, the Client Agency Engineer may permit the use of other methods or equipment. Where hand spreading is permitted, the mixture shall be placed by means of suitable shovels and other tools, and in a uniformly loose layer at a thickness that will result in a completed pavement meeting the designed grade and elevation.

Placement Tolerances: Each lift of HMA placed at a uniform design thickness shall meet the following requirements for thickness and area. Any pavement exceeding these limits shall be subject to an HMA adjustment or removal. Lift tolerances will not relieve the Contractor from meeting the final designed grade. Lifts of designed non-uniform thickness, i.e. wedge or shim course, shall not be subject to thickness and area adjustments.

- a. Thickness- Where the total thickness of the lift of mixture exceeds that shown on the plans beyond the tolerances shown in Table 2, the longitudinal limits of such variation including locations and intervals of the measurements will be documented by the Engineer for use in calculating a HMA adjustment in 4.06.04-2.

**TABLE 2 - Thickness Tolerances**

Mixture Designation	Lift Tolerance
Class 4 and HMA S1	+/- 3/8 inch
Class 1, 2 and 12 and HMA S0.25, S0.375, S0.5	+/- 1/4 inch

Where the thickness of the lift of mixture is less than that shown on the plans beyond the tolerances shown in Table 2, the Contractor, with the approval of the Client Agency Engineer, shall take corrective action in accordance with this specification.

- b. Area- Where the width of the lift exceeds that shown on the plans by more than the designed thickness of each lift, the longitudinal limits of such variation including locations and intervals of the measurements will be documented by the Client Agency Engineer for use in calculating a HMA adjustment in 4.06.04-2.
- c. Delivered Weight of Mixture - When the delivery ticket shows that the truck exceeds the allowable gross weight for the vehicle type the quantity of tons representing the over weight will be documented by the Client Agency Engineer for use in calculating a HMA adjustment in 4.06.04-2.

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Transverse Joints: All transverse joints shall be formed by saw-cutting a sufficient distance back from the previous run, existing bituminous concrete pavement or bituminous concrete driveways to expose the full thickness of the lift. A brush of tack coat shall be used on any cold joint immediately prior to additional bituminous concrete mixture being placed.

Tack Coat Application: A thin uniform coating of tack coat shall be applied to the pavement immediately before overlaying and be allowed sufficient time to break (set). All surfaces in contact with the HMA that have been in place longer than 3 calendar days shall have an application of tack coat. The tack coat shall be applied by a non-gravity pressurized spray system that results in uniform overlapping coverage at a target application rate of  $0.07 \pm 0.02$  gallons per square yard for a non-milled surface and a target application rate of  $0.12 \pm 0.02$  gallons per square yard for a milled surface. For areas where both milled and un-milled surfaces occur, the tack coat shall be a target application rate of  $0.07 \pm 0.02$  gallons per square yard. The Client Agency Engineer must approve the equipment and the method of measurement prior to use. The material for tack coat shall not be heated in excess of 160°F and shall not be further diluted.

Compaction: The Contractor shall compact the mixture to meet the density requirements as stated in Section 4.06.03-11 and eliminate all roller marks without displacement, shoving, cracking, or aggregate breakage.

The Contractor shall only operate rollers in the dynamic mode using the oscillatory system at the lowest frequency setting on concrete structures such as bridges and catch basins. The use of the vibratory system on concrete structures is prohibited.

Rollers operating in the dynamic mode shall be shut off when reversing directions.

If the Client Agency Engineer determines that the use of compaction equipment in the dynamic vibratory mode may damage highway components, utilities, or adjacent property, the Contractor shall provide alternate compaction equipment. The Client Agency Engineer may allow the Contractor to operate rollers in the dynamic mode using the oscillatory system at the lowest frequency setting.

These allowances will not relieve the Contractor from meeting pavement compaction requirements.

Surface Requirements: The pavement surface of any lift shall meet the following requirements for smoothness and uniformity. Any irregularity of the surface exceeding these requirements shall be corrected by the Contractor.

- a. Smoothness - Each lift of the surface course shall not vary more than 1/4 inch from a Contractor-supplied 10 foot straightedge. For all other lifts of HMA, the tolerance shall be 3/8 inch. Such tolerance will apply to all paved areas.

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- b. Uniformity - The paved surface shall not exhibit segregation, rutting, cracking, disintegration, flushing or vary in composition as determined by the Client Agency Engineer.

**6. Acceptance Inspection, Sampling and Testing:** Inspection, sampling, and testing to be used by the Client Agency Engineer shall be performed at the minimum frequency specified in Section M.04 and stated herein.

Sampling for acceptance shall be established using a statistically based procedure of random sampling approved by the Client Agency Engineer.

HMA Plant Material Acceptance: The Contractor shall provide the required acceptance sampling, testing and inspection during all phases of the work in accordance with Section M.04.

HMA Density Acceptance: All acceptance testing will be performed by the Client Agency Engineer for the completed pavement course on roadways and bridges in accordance with the Client Agency's density testing procedures. Each lift designed to a compacted lift of 1½ inches or more shall have the HMA pavement including the longitudinal joints compacted to 94.5 +/- 2.5 percent of the maximum theoretical gravity. Bituminous Concrete Class 4 and HMA S1 are excluded from the longitudinal joint density requirements.

**7. Density Dispute Resolution Process:** The Contractor and the Client Agency Engineer will work in partnership to avoid potential conflicts and to resolve any differences that may arise during quality control or acceptance testing for density. Both parties will review their sampling and testing procedures and results and share their findings. If the Contractor disputes the Client Agency Engineer's test results, the Contractor must submit in writing a request to initiate the Dispute Resolution Process within 10 calendar days of the placement of the mixture. No request for dispute resolution will be allowed unless the Contractor provides quality control results supporting its position. Should the dispute not be resolved through evaluation of existing testing data or procedures, the Client Agency Engineer may authorize the Contractor to obtain representative core samples of the pavement. The core samples must be extracted no later than 30 calendar days from the date of Client Agency Engineer's authorization. Core samples shall be located using the stratified random sampling procedure in accordance with ASTM D 3665 as determined by the Client Agency Engineer. Core samples shall be extracted and filled using the procedure outlined in the Core Correlation Procedure. The densities from the 5 representative cores will be averaged for determining the final HMA density acceptance including any payment adjustments, in accordance with Section 4.06.04-2, that may apply.

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- 8. Corrective Work Procedures:** Any portion of the completed pavement that does not meet the requirements of the specification shall be corrected at the expense of the Contractor. Any corrective courses placed as the final wearing surface shall not be less than 1½ inches in thickness after compaction.

If pavement placed by the Contractor does not meet the specifications, and the Client Agency Engineer requires its replacement or correction, the Contractor shall:

- a. Propose a corrective procedure to the Client Agency Engineer for review and approval prior to any corrective work commencing. The proposal shall include:
    - Limits of pavement to be replaced or corrected, indicating stationing or other landmarks that are readily distinguishable.
    - Proposed work schedule.
    - Construction method and sequence of operations.
    - Methods of maintenance and protection of traffic.
    - Material sources.
    - Names and telephone numbers of supervising personnel.
  - b. Perform all corrective work in accordance with the Contract and the approved corrective procedure.
- 9. Protection of the Work:** The Contractor shall protect all sections of the newly finished pavement from damage that may occur as a result of the Contractor's operations for the duration of the Project. Prior to the Client Agency Engineer's authorization to open the pavement to traffic, the Contractor is responsible to protect the pavement from damage.