

**ADDENDUM NO. 1
TO THE BID DOCUMENTS**

Project: City of Homer 2016 Paving Project
Addendum Issue Date: August 5, 2016
Bid Date: **August 11, 2016**, 2:00 PM (Thursday)
Previous Addenda Issued: -0-
Issued By: Dan Gardner
Public Works Superintendent
City of Homer
Homer, AK 99603
dgardner@ci.homer.ak.us

Bidders must acknowledge receipt of this addendum prior to the date set for bid opening by one of the following methods:

- (1) By acknowledging receipt of this addendum in the bid submitted, or
- (2) By telegram, facsimile (fax) or email, which includes a reference to the project and addendum number.

The bid documents require acknowledgement individually of all addenda to the drawings and/or specifications. This is a mandatory requirement and any bid received without acknowledgment of receipt of addenda may be classified as not being a responsive bid.

The bid documents for the above project are amended as follows (all other terms and condition remain unchanged):

ITEM 1

Section 404 – 3.01 Shaping and Grading: Remove the line “Use a finish grader that is equipped with an automatic grad and cross slope control system”.

ITEM 2

Section 401 Paving Specification: Delete this section and replace with attached section.

ITEM 3

Revised Bid Schedule: Replace the Bid Schedule with the attached Bid Schedule Addendum 1. Revised Bid Schedule includes Early Spring Street as an Additive Bid which will be awarded if funding allows.

End of Addendum #1

**CITY OF HOMER
2016 PAVING PROJECT
E. BUNNELL AVE
Bid Schedule**

Addendum 1, 8-5-2016

Bid Item	Description & Written Unit Price in Words	Estimated Quantity	Unit Bid Price	Total Bid Price
101	Mobe / Demob	1 L.S.		
	lump sum			
102	Construction Surveying	1 L.S.		
	Lump Sum			
206	2" Leveling Course	38 TON		
	per ton			
401	2" Asphalt Pavement	2,075 SY		
	per square yard			
402	Painted Traffic Markings	1 L.S.		
	lump sum			
404	Crush Existing AC Pavement	2,075 SY		
	per square yard			
512	Adjust SSMH/SDMH to Grade	4 EA		
	Each			
607	Adjust Valve Box to Grade	2 EA		
	Each			
712	Asphalt Speed Hump	1 EA		
	Each			

BS-1

Construction Total

**CITY OF HOMER
2016 PAVING PROJECT
BELUGA PLACE
Bid Schedule**

Addendum 1, 8-5-2016

Bid Item	Description & Written Unit Price in Words	Estimated Quantity	Unit Bid Price	Total Bid Price
101	Mobe / Demob	1 L.S.		
	lump sum			
102	Construction Surveying	1 L.S.		
	Lump Sum			
206	2" Leveling Course	22 TON		
	per ton			
401	2" Asphalt Pavement	980 SY		
	per square yard			
402	Painted Traffic Markings	1 L.S.		
	lump sum			
404	Crush Existing AC Pavement	980 SY		
	per square yard			
712	Asphalt Pavement Hump	1 EA		
	per square yard			

BS-2

Construction Total _____

**CITY OF HOMER
2016 PAVING PROJECT
CLOVER LANE
Bid Schedule**

Addendum 1, 8-5-2016

Bid Item	Description & Written Unit Price in Words	Estimated Quantity	Unit Bid Price	Total Bid Price
101	Mobe / Demob	1 L.S.		
	lump sum			
102	Construction Surveying	1 L.S.		
	Lump Sum			
206	2" Leveling Course	70 TON		
	per ton			
401	2" Asphalt Pavement	3,365 SY		
	per square yard			
402	Painted Traffic Markings	1 L.S.		
	lump sum			
404	Crush Existing AC Pavement	3,365 SY		
	per square yard			
512	Adjust SSMH/SDMH to Grade	3 EA		
	Each			
711	Adjust Monument to Grade	3 EA		
	Each			

BS-3

Construction Total _____

**CITY OF HOMER
2016 PAVING PROJECT
CLOVER PLACE
Bid Schedule**

Addendum 1, 8-5-2016

Bid Item	Description & Written Unit Price in Words	Estimated Quantity	Unit Bid Price	Total Bid Price
101	Mobe / Demob	1 L.S.		
	lump sum			
102	Construction Surveying	1 L.S.		
	Lump Sum			
206	2" Leveling Course	20 TON		
	per ton			
401	2" Asphalt Pavement	1,150 SY		
	per square yard			
402	Painted Traffic Markings	1 L.S.		
	lump sum			
404	Crush Existing AC Pavement	1,150 SY		
	per square yard			
512	Adjust SSMH/SDMH to Grade	1 EA		
	Each			
711	Adjust Monument to Grade	1 EA		
	Each			

BS-4

Construction Total _____

**CITY OF HOMER
2016 PAVING PROJECT
Hillview Place
Bid Schedule**

Addendum 1, 8-5-2016

Bid Item	Description & Written Unit Price in Words	Estimated Quantity	Unit Bid Price	Total Bid Price
101	Mobe / Demob	1 L.S.		
	lump sum			
102	Construction Surveying	1 L.S.		
	Lump Sum			
206	2" Leveling Course	18 TON		
	per ton			
401	2" Asphalt Pavement	860 SY		
	per square yard			
402	Painted Traffic Markings	1 L.S.		
	lump sum			
404	Crush Existing AC Pavement	860 SY		
	per square yard			

BS-5

Construction Total

CITY OF HOMER
2016 PAVING PROJECT Addendum 1, 8-5-2016
MULLIKIN STREET
Bid Schedule

Bid Item	Description & Written Unit Price in Words	Estimated Quantity	Unit Bid Price	Total Bid Price
101	Mobe / Demob	1 L.S.		
	lump sum			
102	Construction Surveying	1 L.S.		
	Lump Sum			
206	2" Leveling Course	40 TON		
	per ton			
401	2" Asphalt Pavement	1,760 SY		
	per square yard			
402	Painted Traffic Markings	1 L.S.		
	lump sum			
404	Crush Existing AC Pavement	1,760 SY		
	per square yard			
512	Adjust SSMH/SDMH to Grade	1 EA		
	Each			
607	Adjust Valve Box to Grade	3 EA		
	Each			
711	Adjust Monument to Grade	1 EA		
	Each			

BS-6

Construction Total _____

**CITY OF HOMER
2016 PAVING PROJECT
KACHEMAK WAY
Bid Schedule**

Addendum 1, 8-5-2016

Bid Item	Description & Written Unit Price in Words	Estimated Quantity	Unit Bid Price	Total Bid Price
101	Mobe / Demob	1 L.S.		
	lump sum			
102	Construction Surveying	1 L.S.		
	Lump Sum			
206	2" Leveling Course	55 TON		
	per ton			
401	2" Asphalt Pavement	2,300 SY		
	per square yard			
402	Painted Traffic Markings	1 L.S.		
	lump sum			
404	Crush Existing AC Pavement	2,300 SY		
	per square yard			
512	Adjust SSMH/SDMH to Grade	2 EA		
	Each			
607	Adjust Valve Box to Grade	4 EA		
	Each			
711	Adjust Monument to Grade	2 EA		
	Each			

BS-7

Construction Total _____

**CITY OF HOMER
2016 PAVING PROJECT
MARK WHITE AVENUE
Engineers Estimate**

Addendum 1, 8-5-2016

Bid Item	Description & Written Unit Price in Words	Estimated Quantity	Unit Bid Price	Total Bid Price
101	Mobe / Demob	1		
	lump sum	L.S.		
102	Construction Surveying	1		
	Lump Sum	L.S.		
206	2" Leveling Course	22		
	per ton	TON		
401	2" Asphalt Pavement	1,105		
	per square yard	SY		
402	Painted Traffic Markings	1		
	lump sum	L.S.		
404	Crush Existing AC Pavement	1,105		
	per square yard	SY		
512	Adjust SSMH/SDMH to Grade	1		
	Each	EA		
607	Adjust Valve Box to Grade	1		
	Each	EA		
711	Adjust Monument to Grade	1		
	Each	EA		

BS-8

Construction Total

**CITY OF HOMER
2016 PAVING PROJECT
EARLY SPRING STREET
Bid Schedule**

Additive Bid, 8-5-16
Addendum 1, 8-5-2016

Bid Item	Description & Written Unit Price in Words	Estimated Quantity	Unit Bid Price	Total Bid Price
101	Mobe / Demob	1 L.S.		
	lump sum			
102	Construction Surveying	1 L.S.		
	Lump Sum			
206	2" Leveling Course	42 TON		
	per ton			
401	2" Asphalt Pavement	1,800 SY		
	per square yard			
402	Painted Traffic Markings	1 L.S.		
	lump sum			
404	Crush Existing AC Pavement	1,800 SY		
	per square yard			
512	Adjust SSMH/SDMH to Grade	2 EA		
	Each			
607	Adjust Valve Box to Grade	1 EA		
	Each			
711	Adjust Monument to Grade	1 EA		
	Each			

BS-9

Construction Total

**BID SCHEDULE - SUMMARY (ADDEMDUM #1)
2016 Paving Project**

Basic Bid Summary		SUMMARY SCHEDULE BID PRICE
BS-1	Subtotal Bid Price - E. Bunnell Avenue	\$ _____
BS-2	Subtotal Bid Price - Beluga Place	\$ _____
BS-3	Subtotal Bid Price - Clover Lane	\$ _____
BS-4	Subtotal Bid Price - Clover Place	\$ _____
BS-5	Subtotal Bid Price - Hillview Place	\$ _____
BS-6	Subtotal Bid Price - Mullikin Street	\$ _____
BS-7	Subtotal Bid Price - Kachemak Way	\$ _____
BS-8	Subtotal Bid Price - Mark White Avenue	\$ _____
Basic Bid Total		\$ _____
Additive Bid Item		
BS-9	Subtotal Bid Price - Early Spring Street	\$ _____
BS-10	Total; Bid Basic Total and Additive Bid Item	\$ _____

Name of Firm _____

Address of Firm _____

Authorized Signature _____

Date

Printed Name and Title of Signatory _____

Date of Bid _____

SECTION 401 ASPHALT CONCRETE PAVEMENT

Delete the Section and add the following in its place:

Article 401.1 Description

The Work under this Section consists of the performance of all Work required for the construction of asphalt concrete pavement on a prepared base.

Article 401.2 Material and Testing

A. Asphalt:

The Contractor shall submit a certified analysis of the asphalt from the refinery laboratory to the Engineer for review and approval. A copy of the certified analysis shall accompany each shipment of asphalt to the asphalt mixing plant. The Engineer may make check acceptance tests of the asphalt binder, and, if the asphalt binder is not in accordance with the certified analysis, it shall be rejected.

- 1) For Class A asphalt concrete, the asphalt cement or binder required by this specification shall conform to the following AASHTO designations.

Meets AASHTO M-320 and the following:

Performance Grade of Asphalt binder	PG 52-28
Softening Point, minimum (AASHTO T-53)	125° F
Toughness, minimum (ASTM D-5801)	110 in-lbs
Tenacity, minimum (ASTM D-5801)	75 in-lbs

- 2) For other classes of asphalt concrete, the asphalt cement or binder required by these Specifications shall conform to the requirements of AASHTO M- 320 and Certified Performance Grade Asphalt Binder PG 52-28.

B. Aggregates

- 1) Class A asphalt concrete

Coarse aggregate for Class D and E asphalt concrete is all mineral retained on the No. 4 sieve. The aggregate retained on a No. 4 sieve shall contain at least eighty percent (80%) by weight of crushed pieces having two or more mechanically fractured surfaces.

All coarse aggregate shall be free from coatings of clay, silt, or other objectionable matter and shall not contain clay balls or other aggregation of fine material. Coarse aggregate shall be tested for soundness in accordance with the requirements of ASTM C-88, or will have proven sound through adequate record of service.

When aggregate grading is such that the material will tend to segregate in stockpile or handling, it shall be supplied in 2 or more sizes. Each size of aggregate required to produce the combined gradation specified shall be placed in individual stockpile at the plant site and separated by bulkheads or other means. When it is necessary to blend 2 or more aggregate sizes, the blending shall be done through separate bins at the cold elevator feeders, and not in the stockpile.

Fine aggregate is composed of all mineral matter passing the No. 4 sieve. It shall consist of natural and/or manufactured material derived by crushing gravel.

The aggregate particles shall be clean, tough, durable, moderately sharp, and free from coating of clay, silt, or other objectionable matter and shall not contain clay balls or other aggregations of fine material. Fine aggregate shall be tested for soundness in accordance with the requirements of ASTM C-88, or shall have a satisfactory soundness record. When tested for soundness, the number of cycles shall be five (5), the solution shall be sodium sulphate; the maximum loss shall be nine percent (9%) by weight. Fine aggregates shall be maintained in individual stockpiles, suitably separated to prevent intermingling.

C. Mineral Filler

Mineral Filler shall conform to the requirements of ASTM D-242.

Article 401.3 Composition of Mixes

A. General Requirements

Paving mixtures prepared under these Specifications shall be composed of aggregate and paving asphalt within the limits set forth in the following table:

Asphalt paving mixtures prepared under these Specifications shall be composed of aggregate and asphalt cement within the limits set forth in the following table:

**Percentages by Weight Passing Sieves
Wearing Course**

Sieve Size	Class A	Class D	Class E
1"	-----	-----	-----
3/4"	100	-----	100
1/2"	68 – 82	100	78 – 96
3/8"	52 – 64	75 – 92	66 – 86
#4	36 – 46	50 – 68	46 – 66
#8	26 – 36	32 – 50	34 – 52
#16	16 – 28	20 – 38	24 – 42
#30	10 – 20	14 – 30	16 – 32
#50	6 – 16	10 – 24	10 – 24
#100	4 – 12	7 – 16	7 – 16
#200	3 – 8	3 – 9	3 – 9
Asphalt Cement *	5.0 – 7.0	5.0 – 7.0	5.0 – 7.0

*By weight of total mix

Target values for the gradation of the Job Mix Design shall be within the Broad Band Limits depicted in the table above.

B. Additive Materials

A "non-stripping" additive shall be added to the asphalt in the amount determined by ATM T-14 or one-fourth percent (0.25%) by weight of the asphalt, if approved by the Engineer. Such additive material shall be of quality and grade acceptable to the Engineer.

C. Job Mix

The Contractor, at his expense, shall submit to the Engineer for approval, a job mix formula within the limits specified above, for each class of mix designated by the Contract. Within each mix design the Contractor shall provide correction factor ignition points generated in accordance with AASHTO T-308. The aggregate gradation of the job-mix formula, when plotted upon an aggregate grading chart, shall closely approximate the shape of average gradations for the limits specified. For that portion of the aggregate passing No. 4 sieve, gradings which range from at or near the maximum of one (1) sieve to at or near the minimum of the next sieve will not be permitted. The Engineer may require increased asphalt content up to one-half percent (0.5%) above that indicated by Marshall Design Criteria. Upon requiring increased asphalt content, the lower limit of percent voids and the upper limit of percent voids filled shall be waived.

D. Maximum Permissible Variations

Tolerances to the approved Job Mix Formula shall not exceed the permissible variations presented in the following table. The Job Mix Formula band shall mean the approved Job Mix Formula plus-or-minus (\pm) the numeric values for the maximum permissible variations.

**Maximum Permissible Variation
(Percent by Weight of Total Aggregate)**

<u>Sieve Size</u>	<u>Class A Asphalt</u>	<u>Class D & E Asphalt</u>
3/8" and Larger	± 6.0	± 5.0
#4	± 5.0	± 5.0
#8	± 5.0	± 4.0
#s 16, 30 & 50	± 4.0	± 4.0
#100	± 3.0	± 3.0
#200	± 2.0	± 2.0
Asphalt	± 0.4	± 0.4

When these permissible variations are applied to the "Class A Asphalt Concrete" Job Mix formula, the broad band limits in Subsection A, above, may be exceeded only as follows:

1. The three-quarter inch (3/4") and No. 200 sieves shall not exceed the broad band limits in SubArticle 6.3.A - General Requirements;
2. All other sieves may exceed the broad band limits in SubArticle 6.3.A - General Requirements for the respective sieve sizes in the above table provided that the Job Mix Formula band is not exceeded.

When these permissible variations are applied to the "Class D or Class E Asphalt Concrete" Job Mix formulas, the individual sieve shall not exceed the Broad Band limits in SubArticle 6.3.A – General Requirements, above. Maximum temperature shall not vary more than twenty-five degrees (25°) Fahrenheit from the approved Job Mix Formula design.

E. Test Methods

The job-mix shall be determined according to the Marshall Method, as set forth in The Asphalt Institute Manual.

Upon compaction and testing of the job-mix specimens, the mixture shall conform to the aforementioned specifications within the following limits:

	<u>Class A Asphalt</u>	<u>Class D & E Asphalt</u>
Stability (Marshall) Pounds Minimum	1200	1200
Flow (Marshall) Maximum	8 to 16	8 to 16
Percent Voids	2.5 to 4.5	3 to 5
Percent Voids Filled with Asphalt	70 to 80	75 to 85

Article 401.4 Equipment

A. General

All equipment furnished by the Contractor shall be maintained in a sound mechanical condition. Equipment shall be serviced and lubricated away from the paving site; units that drip fuel, oil and/or grease shall be removed from the Project until such leakage is corrected to the satisfaction of the Engineer.

B. Asphalt Mixing Plant

All plants, used by the Contractor, shall be designed, coordinated and operated to produce a mix uniformly within the job- mix tolerances as listed herein and in accordance with AASHTO M-156. The plant may be either a weightbatch type or a volumetric proportioning, continuous/drum mixing type, provided the equipment has demonstrated that it is suitable for producing finished mixtures complying with the job-mix formula specified herein.

The plant shall be equipped with the necessary equipment for storing, handling, drying, heating and mixing the aggregate and asphalt. Satisfactory means shall be provided for aggregate and asphalt control as to quantity and temperature. Adequate safety measures shall be provided on stairs, gears, pulley, chains, sprockets, and all other dangerous moving parts.

Contractor shall calibrate the asphalt plant not more than thirty (30) days in advance of production and furnish copies of the data to the Engineer at least one day prior to asphalt concrete production. Aggregate and asphalt cement sampling locations meetings OSHA safety requirements shall be provided. Proportioning (batch) scales shall not be used for weighing material for payment. Weight scales used in conjunction with a storage silo may be used to weight the final product for payment, provided the scales are certified by the State of Alaska. The asphalt plant shall maintain a current Air Quality Permit issued by the State of Alaska.

C. Pavers

Asphalt pavers shall be self-propelled units provided with a heated vibratory screed. Grade and cross slope shall be controlled through the use of automatic grade and slope control devices. The paver screed control system shall be automatically actuated by the use of an erected string-line or a mobile string-line (ski) at least thirty feet (30') in length on the high side of the paver. Grade control shall be used on either (a) both the high and low sides, or (b) grade control on the high side and slope control on the low side.

The Contractor may request a waiver for the screed control system (string-line or ski) if he or she believes the paving grade poses an unreasonable obstacle in the form of extreme horizontal or vertical curves or unusual cul-de-sac and/or street configuration.

For trails, pavers shall be capable of placing the required thickness in one lift with a minimum paving width of five feet (5'), truck-towed spreader-type equipment will be permitted, providing the width and depth requirement can be met.

The paver shall be equipped with a receiving hopper having sufficient capacity for a uniform spreading operation. The hopper shall be equipped with a distribution system to place the asphalt concrete mixture uniformly in front of the screed without segregation and/or tearing.

The term "screed" includes any strike-off device operated by cutting, crowding, or other action which is effective on mixes at workable temperatures, without tearing, shoving, or gouging, and which produces a finished surface of an even and uniform texture. The screed shall be adjustable as to level and section and shall have provisions for vibration and heat.

The screed assembly shall produce a finished surface of the required smoothness, thickness, and texture without tearing, shoving, displacing or segregating the asphalt concrete mixture. Screed extensions used for paving a constant width shall be heated and vibrated. Auger extensions shall be within one and one-half feet (1.5') of the screed extension on both sides.

The paver shall be capable of placing courses in thicknesses of from one-half inch (1/2") to at least three inches (3"), and, in width, be adjustable in increments of six inches (6") and one foot (1').

The use of a pick-up machine to transfer the asphalt concrete mixture from a windrow to the paver hopper will be permitted, provided the pick-up machine is capable of collection of the windrowed material without damage to the underlying course. The Engineer will not allow the continued use of the pick-up machine if segregation, excessive temperature loss, or any detrimental effects are observed.

Paver shall be equipped with a means of preventing the segregation of the coarse aggregate particles from the remainder of the bituminous concrete mixture while being carried from the paver hopper over the slat-conveyor to the auger chamber. The mechanism to accomplish this must be approved in writing by the paver manufacturer and may consist of chain curtains, deflector plates, or other devices and may be any combination of these.

The following specific requirements apply to the following identified bituminous pavers:

1. Blaw-Knox bituminous paver shall be equipped with the Blaw-Knox Materials Management Kit (MMK).
2. Cedarapids bituminous paver must have been manufactured in 1989 or later.
3. Caterpillar bituminous pavers shall be equipped with the following deflector plate models: 6630, 6631, or 6640.

Contractor shall provide a Certificate of Compliance that verifies the required mechanism has been installed to prevent bituminous paver segregation.

The Engineer shall approve all mechanisms proposed by Contractor for preventing paver segregation of coarse aggregate prior to the bituminous paver's use on the project.

D. Rollers

Rollers shall be self-propelled, reversible, and equipped to maintain clean and straight contact surfaces. Heat shall be maintained on pneumatic tires by skirting or other approved devices.

The number, weight, and type of rollers furnished shall be sufficient to obtain the required density and surface requirements while the mix is in a workable condition. One pneumatic and a minimum of one vibratory roller shall be furnished and operated in a workmanlike manner by the Contractor. There shall be at least one operator for each roller.

Pneumatic Tired Rollers:

Pneumatic tired roller shall ride on not less than seven uniformly sized and uniformly inflated smooth tires mounted on wheel rims of twenty inch (20") minimum diameter. The rear group of tires shall align behind and cover the spaces between the forward group of tires. Tires shall be inflated, and the roller ballasted, to provide a uniform (plus or minus five [5] pounds per square inch) minimum ground contact weight of seventy (70) pounds per square inch, unless a lower weight is requested in writing by the Engineer. If a pneumatic roller experiences a pick-up problem, the Contractor shall be required to add an effect release agent to the tire watering tank.

Steel-Drum Rollers: Steel-wheel roller may be of two (2) types:

Two-axle static drum rollers, 8 to 22 tons in weight.

Two-axle vibratory drum rollers, 8 to 22 tons in weight.

All rollers shall be equipped with power units of not less than four (4) cylinders and under working conditions shall develop a compression in the rear wheels of two hundred fifty (250) to three hundred fifty (350) pounds per inch of roller width. Rollers shall be in good working condition and be free from backlash, faulty steering mechanism, or worn parts. Rollers shall be equipped with adjustable scrapers to keep the drums clean and with efficient means of keeping the drums/wheels wet to prevent mixes from sticking to the drums. Rollers/Drums shall be free of flat areas, openings or projections which will mar the surface of the pavement.

E. Haul Trucks

Vehicles used for the transportation of hot-mix asphalt from the plant to the Project shall have tight metal bottoms and shall be free from dust, screenings, petroleum oils, volatiles, and other mineral spirits which may affect the mix being hauled. The truck beds shall be cleaned as often as required, but at least once a day. After this operation the truck bed shall be elevated and thoroughly drained; no excess solution shall be permitted.

When requested by the Engineer, trucks shall be equipped with covers of canvas, insulated boxes, or other suitable material, and be of sufficient size and weight to protect the load from adverse weather conditions and to maintain the required mix temperatures.

F. Truck Scales

Hot mix asphalt shall be weighed on platform scales furnished by the Contractor or on public scales at the Contractor's expense. The scales shall be satisfactory to the Engineer and shall comply with all State Laws governing the use of scales. The scales shall be tested and sealed by an authorized public official, at the expense of the Contractor, as often as the Engineer may

deem necessary to ensure their accuracy. Batch plant proportioning scales may be used in lieu of truck scales only with the written approval of the Engineer.

G. Hand Tools

Only lutes or asphalt rakes shall be used during the spreading operation and when finishing by hand.

Tamping irons shall weigh not less than twenty-five (25) pounds and shall have a bearing area not exceeding forty-eight (48) square inches. Mechanical compaction equipment, satisfactory to the Engineer, may be used instead of tamping irons.

H. Straightedges

Straightedges ten (10') and sixteen feet (16') in length, to test the finished surface, shall be provided by the Contractor. The sixteen foot (16') straightedge shall be used on straight sections and the ten foot (10') straightedge on vertical curves or crown.

Article 401.5 Construction

A. Weather Limitations

Asphalt concrete mixture shall not be placed when it is raining or when rain is imminent, on a saturated surface, on an unstable/yielding roadbed, when the base material is frozen, or when weather conditions prevent proper handling or finishing of the mixture. Asphalt concrete mixture shall not be placed unless the surface temperature is forty-five degrees (45°) Fahrenheit or warmer and the ambient air is at least thirty-two degrees (32°) Fahrenheit and not descending. Air temperature shall be measured in the shade away from heat sources at the paving site.

B. Preparation of Area to be Paved

The area to be paved shall be true to line and grade, having a smooth dry, compacted surface prior to the start of paving operations. The area to be paved shall be free from all loose asphalt and foreign material.

Contractor shall notify the Engineer, a minimum of twenty-four (24) hours prior to paving, that the newly constructed, rotomill planed, or existing surface, has been prepared in conformance with the Drawings and Specifications and are ready to be paved. Engineer or his representative shall inspect the grade through the use of string line, straightedge, levels, or any other means necessary. Upon determining the grade that has been proposed for paving is in conformance with the Drawings and Specifications, Engineer will provide written authorization for the Contractor to proceed with the paving. The Contractor shall not initiate paving prior to receiving written authorization to proceed.

The surface of the Leveling Course, when finished, shall not demonstrate any deviation in excess of three-eighths inch in ten feet (3/8" in 10') parallel with, and at right angles to, the centerline, or more than five-eighths inch (5/8") total from centerline to face of curb of the area to be paved. Any deviation in excess of this amount shall be corrected by loosening, adding, or removing material and reshaping and compacting to satisfy the above requirement.

Existing paved surfaces shall be cleaned of loose material by sweeping with a power broom, supplemented by hand sweeping, if determined necessary by the Engineer.

After rotomilling of a section of the roadway has been completed, that section shall be inspected by the Engineer for areas of distress or failure. Areas requiring repair shall have the remaining pavement removed, and the distressed area shall be excavated to the depth and limits directed by the Engineer. The excavated area shall be backfilled, as directed by the Engineer, with crushed aggregate Leveling Course material and/or Asphalt Concrete leveling course in conformance with the Drawings and Specifications. Pavement surface irregularities, remaining from the rotomilling effort, that extend more than three-quarters inch (3/4") below the milling indentations shall be pre-leveled and brought into conformance with the tolerances established in Article 6.6 - Density and Surface Requirements. Pre-leveling shall be completed with an approved Class D asphalt concrete in accordance with this Section and include the furnishing, hauling, placing, and compaction of the asphalt concrete.

Contact surfaces of curbing, gutters, manholes, and other structures shall be painted with a thin, uniform coating of asphaltic cement or approved equal material prior to the mixture being placed against them. Butt joints on previously placed cooled pavement shall be saw cut and tack coated prior to continuing the paving operation.

Contractor shall not pave against newly placed concrete curbing until said curbing has cured for a minimum five (5) days. For the purpose of paving operations only, curb curing time may be reduced to seventy-two (72) hours only upon receipt of Contractor's written certification that Type III Portland High-Early-Strength cement concrete was used in, properly placed, and appropriate curing compounds were applied to the adjacent curb and gutter.

C. Preparation of Paving Asphalt

The asphalt shall be heated at the paving plant to a temperature at which it can be properly handled through the pumping system, but at no time shall the temperature of the asphalts exceed that recommended by the asphalt supplier or manufacturer, or be greater than three hundred twenty-five degrees (325°) Fahrenheit or less than two hundred fifty degrees (250°) Fahrenheit.

D. Preparation and Handling of Aggregates

The aggregate for the asphalt concrete mixture shall be heated and dried to a temperature compatible with the mix requirements specified. The burner on the dryer shall be properly adjusted to avoid damage to the aggregate and to avoid the presence of unburned fuel on the aggregate. Any asphalt concrete mixture in which soot or fuel is present shall be wasted and no payment made.

Drying operations shall reduce the aggregate moisture content so that the moisture content of the asphalt concrete mixture, sampled at the point of acceptance for asphalt cement content, shall be no more than one-half percent (0.5%) (by total weight of mix), as determined by ATM T-25. Adequate dry storage shall be provided for the mineral filler.

Aggregates shall be stored at the plant in such a manner that the separate sizes will not become intermixed. Cold aggregate shall be carefully fed to the plant in such proportions that surplus and shortages in the hot bins will not cause breaks in the continuous operations.

Stockpiles and bins shall be sampled for gradation analysis, dust coating, and for other purposes, at the option of the Engineer.

When requested by the Engineer, the Contractor shall provide representative samples from each of the hot bins. Samples shall be used to determine compliance with these Specifications.

1. Drying:

The aggregate shall be thoroughly dried and heated to provide a paving mix within a tolerance specified herein. The moisture content of the heated and dried aggregate shall not exceed one-half percent (0.5%). Dust collected during the drying operation may be fed uniformly back into the hot aggregate prior to screening, provided a position mechanical feed is used which will control the feedback to the quantity specified by the Engineer.

2. Screening:

Aggregates shall be screened into sizes that may be recombined into a gradation meeting the requirements of the job-mix formula. Screens shall have normal capacities slightly in excess of the production capacity of the mixer and rated capacity of the dryer.

3. Hot Aggregate Storage:

Hot screened aggregate shall be stored in such a manner as to minimize segregation and loss of temperature.

E. Mixing Plants and Controls

All plants shall be equipped with a positive means to govern the time of mixing. Mixing time shall not be altered unless requested by the Engineer. Frequent gradation analysis of the hot aggregates of the completed mix shall be made to be certain that the materials being used and produced are within the tolerances of the job-mix formula and the specifications of the mix being used. If the mix is found to be outside the hot-mix formula tolerances or outside the specification limits, corrections shall be made in quantities measured from the hot bins and suitable changes made at the cold bin feeders. It shall be the responsibility of the Contractor to furnish a finished product in accordance with the Contract Documents. Tests conducted by the Engineer are for quality acceptance purposes only and are not authorized for use in plant calibration. Plant metering systems and scales shall be calibrated to the accuracy specified in AASHTO M-156.

Batch Type Plant: When the mix is produced in a batch type plant, the aggregate shall be accurately weighed in the proper proportions to provide the batch weight.

The asphalt shall be heated to provide a material sufficiently fluid to produce a uniform coating on every particle of aggregate within the specified mixing time. The temperature of the aggregates and asphalt immediately prior to mixing shall be approximately that of the completed batch. In no case shall the temperature of the asphalt and aggregate vary more than twenty-five degrees (25°) Fahrenheit when placed in the mixing chamber.

A dry mixing period of not less than ten (10) seconds shall precede the addition of the asphalt to the mix. Excess wet mixing shall be avoided. Wet mixing shall continue as long as is necessary to obtain a thoroughly blended mix. The minimum percent of coated particles used to establish the mixing time interval shall be ninety-five percent (95%) as determined by AASHTO T-195.

Continuous Type Plant: Continuous mix and drum plants shall in general be controlled in the same manner as batch plants.

The determination of mixing time shall be by weight method under the following formula unless otherwise approved:

$$\text{Mixing time in seconds} = \frac{\text{Pugmill Dead Capacity in Pounds}}{\text{Pugmill Output in Pounds Per Second}}$$

The weights used for computing mixing time shall be determined for the job, from tests made by the Contractor and shall conform to the recommendations of the manufacturer. Mixing temperature shall not exceed that recommended by the asphalt cement manufacturer without the written approval of the Engineer. To aid in determining the proper temperature of the completed batch, current viscosity data shall be available at the plant at all times.

F. Transportation of Mix

The dispatching of the hauling vehicles shall be so scheduled that all material delivered may be placed and rolled in daylight. When variations in size of loads, speed of trucks, length of haul, and conditions of trucks interfere with orderly continuous operations, the Engineer may order suitable corrections to be made.

G. Mechanical Spreading

Contractor shall submit a Paving Plan for the Engineer's review a minimum of five (5) working days prior to initiating paving operations. The plan shall consist of at least the following items:

1. Paving schedule to include sequence of operations.
2. Operational details to include:
 - a. Plant operating capacity and target production rate. Process control testing frequency for gradation, moisture, asphalt cement content, and compaction.
 - b. Number and capacity of trucks, cycle time, and delivery rate.
 - c. The manufacturer and model of the paver and pick-up machine to include information on grade followers, sensors, operating speed, and production rate of the pavers.
 - d. Number, type, weight, and operating speed of rollers, including replacement roller.
 - e. Location and method of constructing longitudinal and transverse joints.
 - f. Construction plan for paving intersections and driveways.
3. The asphalt concrete shall be placed on the road surface at a temperature not less than two hundred fifty degrees (250°) Fahrenheit or greater than three hundred degrees (300°) Fahrenheit. Additionally, the maximum temperature to which the asphalt concrete is heated shall not exceed the supplier's recommendation. The asphalt concrete temperature shall be measured directly behind the paver screed at the time of placement.

The asphalt concrete mixture shall be laid upon a surface approved in writing by the Engineer, spread and struck-off and compacted to the thickness specified in the Drawings and specifications. Asphalt pavers shall be used to distribute the asphalt concrete mixture in lanes of such widths as to hold to a practical minimum the number of longitudinal joints required.

Longitudinal joints and edges shall be constructed to true line markings. Lines shall be established parallel to the center line for the paver to follow in placing individual lanes. The paver shall be operated and positioned to closely follow the established line. When backing trucks to the finisher, care shall be taken not to jar the paver.

The texture of the unrolled surface shall be checked to determine its uniformity. The adjustment of the screed, tamping, feed screws, hopper feed, etc., shall be checked frequently to assure uniform spreading of the mix. Segregation of the material shall not be permitted. If segregation occurs, the spreading operation shall be immediately suspended until the cause is determined and corrected.

Any irregularities left by the paver shall be corrected by trimming directly behind the machine by use of lutes or covered rakes. Immediately after trimming, the edges of the course shall be thoroughly compacted by tamping. Distortion of the pavement during this operation shall be avoided.

Edges against which additional pavement is to be placed shall be vertically formed to true line. A lute or covered rake shall be used immediately behind the finisher, when required to obtain a true line and vertical edge. Any irregularities in the surface of the pavement course shall be corrected directly behind the paver. Excess material forming high spots shall be removed by a shovel or lute. Indented areas shall be filled with hot-mix and smoothed with the back of a shovel pulled over the surface. Fanning of material over such areas shall not be permitted.

On longitudinal joints, the paver shall be positioned so that in spreading, the material overlaps the edge of the lane previously placed by one or two inches (1" or 2") and is sufficiently high to allow for compaction. The coarse aggregate in the material overlapping the joint shall all be raked out into the cold lane as soon as possible behind the paver and broomed up and wasted. In no case shall scattered rocks be rolled into the surface of either lane.

Asphalt concrete mixture which is contaminated or segregated will be rejected.

When multiple lifts are specified in the Contract, the final lift shall not be placed until all lower lifts throughout that section, as defined by the Paving Plan, have been placed and accepted. Paving shall not begin until all adjacent curb has been poured for at least seven (7) days when Type I/II cement is used or three (3) days when Type III cement is used.

H. Hand Spreading

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable, the asphalt concrete mixture shall be spread, raked, and luted by hand tools. For such areas, the asphalt concrete mixture shall be placed to the required compacted thickness and density.

I. Compaction

Immediately after the asphalt mixture has been spread, struck off and surface irregularities adjusted, it shall be thoroughly and uniformly compacted by rolling.

The surface shall be rolled when the mixture is in the proper condition and when the rolling does not cause undue displacement, cracking, or shoving.

Initial rolling shall be done with a steel-drum roller with the drive roll operating toward the paver, and/or a suitable pneumatic tired roller. Initial rolling shall be completed while the bituminous mat temperature is above two hundred twenty-five degrees (225°) Fahrenheit.

Following the initial rolling at least three coverages of the pavement shall be completed with a pneumatic tired roller, while the mat temperature is above one hundred seventy-five degrees (175°) Fahrenheit.

Final rolling shall be completed with a steel-drum roller and shall continue until roller marks and further compression are not evident in the pavement and specified density has been achieved.

Unless otherwise directed, rolling shall begin at the sides and proceed longitudinally parallel to the road center line, each trip overlapping one-half the roller width, gradually progressing to the crown of the road. When paving in echelon or abutting a previously placed lane, the longitudinal joint should be rolled first followed by the regular rolling procedure. On superelevated curves the rolling shall begin at the low side and progress to the high side by overlapping of longitudinal trips parallel to the centerline.

Any displacement occurring as result of the reversing of the direction of a roller, or from other causes, shall be corrected at once by the use of rakes and addition of fresh mixture when required. Care shall be exercised in rolling not to displace the line and grade of the edges of the asphalt mixture.

To prevent adhesion of the mixture to the rollers, the wheels shall be kept properly moistened with water or water mixed with very small quantities of detergent or other approved material. Excess liquid will not be permitted.

Along forms, curbs, headers, walls, and other places not accessible to the rollers, the mixture shall be thoroughly compacted with hot hand tampers, smoothing irons, or with mechanical tampers. On depressed areas, a trench roller may be used or cleated compression strips may be used under the roller to transmit compression to the depressed area.

Rollers or other vehicles shall not be parked or left standing on pavement that has not cooled sufficiently to prevent indentation by wheels.

J. Joints

The Contractor shall not construct longitudinal joints in the driving wheel paths. The Contractor shall align the joints of the top layer of pavement to either the centerline of the road or to lane lines. The Contractor shall offset the longitudinal joint in the top layer of pavement not more than six inches (6") from centerline of edge of stripe. Joints shall be constructed to ensure a continuous bond between old and new sections of the course. All joints shall present the same texture and smoothness as other sections of the course. The Contractor shall offset the longitudinal joints in the top layer from the joint in the layer immediately below by at least four inches (4").

When joining existing pavement and new pavement, the old pavement shall be cut in a neat line with a power driven saw.

Improperly formed joints resulting in surface irregularities shall be removed full depth, replaced with fresh asphalt concrete mixture, and thoroughly compacted. Rolling of joints after the

material has cooled below one hundred seventy degrees (170°) Fahrenheit shall not be allowed. All pavement removal shall be precut to a neat line with a power-driven saw.

A tack coat of asphalt cement or asphalt emulsion shall be applied on all cold joints and allowed to break prior to placing fresh asphalt concrete mixture against the joint. This Work shall be completed by Contractor just prior to paving.

Transverse joints shall be formed by saw cutting back on the previous run to expose the full depth of the course or by using a removable bulkhead. Transverse joints shall not be perpendicular to centerline, but shall be skewed between fifteen and twenty-five degrees (15° and 25°).

K. Repair and Replacement

Asphalt concrete mixture that becomes contaminated with foreign material or is in any way defective as determined by the Engineer shall be removed. Skin patching will not be permitted. Defective materials shall be removed for the full thickness of the course. The pavement shall be cut so that all edges are vertical, the sides are parallel to the direction of traffic, and the ends are skewed between fifteen and twenty-five degrees (15° and 25°). Edges shall be coated with a thin tack coat of material. Fresh asphalt concrete mixture shall be placed in sufficient quantity so that the finished surface will conform to grade and smoothness requirements. The asphalt concrete mixture shall be compacted to the density specified. Any area determined to have an excess or deficiency of asphalt concrete shall be corrected by full depth removal and replacement. No payment shall be made for material replacing defective material. All costs associated with the patching of defective areas shall be borne by Contractor.

L. Vehicular Traffic

Contractor shall not allow vehicular traffic on the asphalt mat surface until the mat surface has cooled to below one hundred twenty degrees (120°) Fahrenheit. Any portion of the asphalt concrete mixture that becomes loose and broken, rutted, or damaged in any way due to vehicular traffic on the asphalt mat surface prior to it cooling to below one hundred twenty degrees (120°) Fahrenheit, shall be removed and replaced with fresh hot asphalt concrete, which shall be compacted to conform with the surrounding area at the specified density.

M. Course Aggregate Separation

The Contractor shall remove all course aggregate separated from the laid down mix and dispose of offsite. At no time will segregated/separated coarse aggregate be allowed to be reintroduced to the mix by means of hand spreading or raking.

When the process of raking segregates coarse aggregate from the mix, the Contractor shall pull segregated course material from the surface prior to compaction. All concrete edges shall be raked smooth by pulling mix towards the concrete or adjoining asphalt. At no time will asphalt mix be allowed to be pushed back onto the road surface once pulled onto adjacent concrete.

N. Cleanup

The contractor shall clean all adjacent surfaces affected by construction. Segregated asphalt shall be removed from all adjacent surfaces and disposed of offsite. The Contractor shall utilize a mechanical sweeper to clean all surfaces disturbed by construction.

Article 401.6 Density and Surface Requirements

The complete pavement shall have a density equal to or greater than ninety-six (96) percent of Maximum

Density (Marshall Method), except for trail pavement which shall have a density equal to or greater than ninety percent (90%). Maximum Density shall be determined in accordance with the test procedures specified in Section 40.01, Article 1.2 - Applicable Standards. The compacted specimens on which the Maximum Density is determined, shall be produced from a laboratory specimen made from the same days mix, and as close to the lay down temperature as practicable.

When requested by the Engineer, the Contractor shall, without charge, provide the Engineer with test samples of asphalt concrete cored from the completed pavement. All cores shall be at least four inches (4") in diameter and the core holes will be patched by the Contractor within seventy-two (72) hours.

The final surface shall be of a uniform texture conforming to true grade, and cross sections in accordance with the Contract Documents. The thickness of the course shall be in accordance with the Drawings and Specifications. Where curb and gutter is present the compacted pavement surface shall be one-eighth inch plus or minus one-eighth inch ($1/8" \pm 1/8"$) above the top front edge of curb.

Prior to the delivery of the first load of asphalt to the Project, the Contractor shall furnish straightedges to the Inspector for checking surface uniformity. Irregularities in the finished pavement surface shall not exceed three-sixteenths of an inch ($3/16"$) within ten feet (10'), or five-sixteenths of an inch ($5/16"$) within sixteen feet (16'). Non-conforming surfaces shall be subject to rejection by the Engineer. Irregularities which develop before the completion of rolling shall be remedied by loosening the surface mix, removing or adding material as may be required, and rerolling.

For trails, a ten foot (10') straightedge, supplied by the Contractor, shall be used to check the paving surface. Surface irregularities shall not exceed one inch in ten feet (1" in 10'). Non-conforming surfaces shall be subject to rejection by the Engineer. Irregularities which develop before completion of rolling shall be remedied by loosening the surface mix, removing or adding material as may be required, and rerolling.

Article 401.7 Measurement

Asphaltic concrete will be paid for by one of the methods as defined in the paragraph below and as designated in the Bid Schedule.

A. Measurement by the Ton

Measurement of hot-mix asphaltic paving materials, unless otherwise provided, shall be weighed on truck scales in accordance with Article 6.4, SubArticle F – Truck Scales. Asphalt concrete pavement shall be measured per ton (2,000 lbs) based on the amount of hot mix asphaltic material actually used in the completed and accepted work modified as follows: the quantity paid for shall not exceed one hundred and five percent (105%) of tonnage determined on the basis of the average core density, the specified neat line thickness, and the completed area of asphaltic concrete pavement. In addition, the Owner will not pay for that portion of any load in excess of the legal gross weight for the vehicle delivering the load.

B. Measurement by the Square Yard

Measurement of hot-mix asphaltic paving materials, unless otherwise provided, shall be measured by the completed and accepted work. The area measured will be that which is shown on the Drawings plus any additional areas as authorized by the Engineer in writing.

The tolerance for thickness of asphaltic concrete under square yard measurement shall be plus or minus one-fourth inch ($1/4"$) from design mat thickness, as shown on the typical section. This

one-fourth inch (1/4") variance shall be the exception only with the average variance for the job being plus or minus one-eighth inch ($\pm 1/8$ ") from the design mat thickness. All asphaltic concrete placed outside the variables allowed will be corrected by the Contractor at his expense.

- C. Measurement by the Linear Foot
Measurement of hot-mix asphaltic paving materials for bike trails, unless otherwise provided, shall be per linear foot along the centerline of the constructed trail. The thickness of asphalt shall not be less than the thickness shown in the typical section as noted on the Drawings.

Article 401.8 Basis of Payment

Payment for this Work shall be in accordance with Division 10, Section 10.07 - Measurement and Payment, and shall include full payment for all Work described in this Section.

Payment shall be made under the following units:

<u>ITEM</u>	<u>UNIT</u>
A.C. Pavement (Class)	Ton
A.C. Pavement (Class, Thickness)	Square Yard
A.C. Pavement (Class, Thickness)	Linear Foot

