



The City of **WORCESTER**

Administration & Finance – Purchasing Division
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August 3, 2026

To All Bidders:

Subject: **Bid No. 8727-M7 – Resurfacing Goddard Memorial Drive (M26-2) / DPW**

ADDENDUM NO. 1

To Whom It May Concern:

With reference to our bid request relative to the above subject, please refer to the changes/modifications/clarifications to the original proposal request.

Questions Received by this Office & Answers from the City:

1. Q: After review, it appears your CIR spec is out of date, can you please review and advise?
A: See updated specification below.
2. Q: Would you please let us know the intent of the sloped granite curb within these project limits? If a remove and reset is requested, would you please revise the bid sheet with the R&R Slope granite curb?
A: R&R Granite Edging has been added. R&R Sloped Edging has been Adjusted. See updated pricing sheet. The intent is to only adjust curb where it is necessary for safety and as requested by the engineer. This includes sidewalks and Wheelchair Ramps as well. Updated P-sheets are attached.

Bidders are requested to acknowledge and/or include this addendum with submission. All other terms, conditions and specifications remain unchanged.

Very truly yours,

Stephen R. McDonald
Assistant Purchasing Director

Paver-Placed In-Place Recycling with Foamed Asphalt

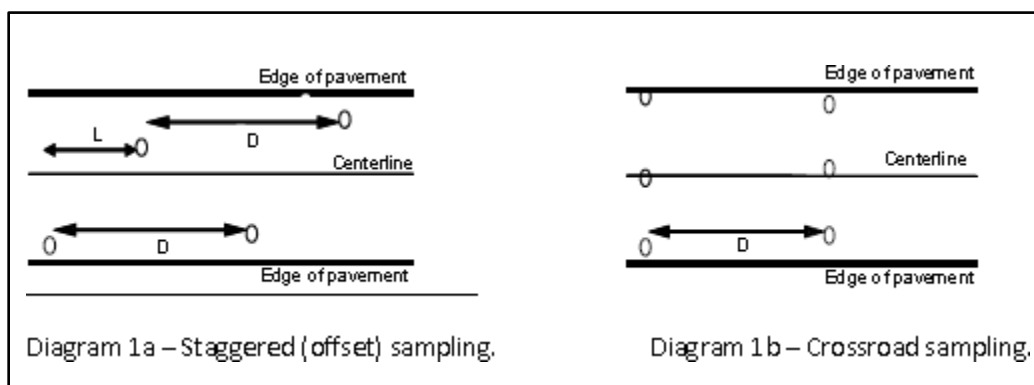
Item 497.031

Core Sampling

1. **DESCRIPTION**

Core sampling and mix design are required to determine a road(s) viability for the Cold In-place Recycling process. It is also an optional process to assess existing road conditions.

Cores shall be obtained using a pattern that results in a representative sample of the pavement to be recycled including at or near lane lines, within and between wheel paths, at the pavement edge, and within shoulders, if shoulders are to be recycled. The roadway shall be sampled in accordance with staggered or offset sampling (as illustrated in **Diagram 1a**) or crossroad sampling with no offset (as illustrated in **Diagram 1b**).



Core samples shall be obtained to the underlying base or subgrade soil. If a core breaks off prior to penetrating the underlying materials, coring shall continue to the bottom of the pavement for thickness-measurement purposes. On retrieval, each core depth shall be measured to the nearest 1/8th inch, and then placed in a separate container and labeled. A coring log summarizing the date, station, offset, and core thickness (depth) shall be recorded for each core location and provided to the mix design laboratory.

D – 1 mile maximum

L – 0.5 mile maximum

- a) At least 15% of the cores shall be in the shoulder, if the shoulder is getting recycled.
- b) At least 25% of the cores shall be on or within 3 feet of centerline.

Arterial and Industrial Streets

D – 2,000 feet maximum

L – 1,000 feet maximum

- a) At least 25% of the cores shall be in the shoulder, if it is getting recycled, or within 3 feet of gutter.

Paver-Placed In-Place Recycling with Foamed Asphalt

- b) At least 25% of the cores shall be on or within 3 feet of centerline.

Residential Streets

- a) For streets less than 250 feet long, a minimum of one core when grouped with other streets to obtain the quantity of material required for mix design.
- b) For streets 250 feet to 500 feet long, a minimum of two cores when grouped with other streets to obtain the quantity of material required for mix design (one within 3 feet of gutter, and the other within 3 feet of centerline).
- c) For streets over 500 feet long, a minimum of three cores when grouped with other streets to obtain the quantity of material required for mix design (one within 3 feet of gutter, one within 3 feet of centerline, and the third between the two).

2. FILLING SAMPLE HOLES

- a) Each sample hole shall be filled in accordance with the procedures described below. After sampling and filling the holes, the roadway shall be cleaned of all loose debris.
- b) A high quality cold patch material shall be used to fill core or milling holes. The cold mix shall be compacted flush with a tamping rod, sledge or Marshall hammer. Approximately the same amount of cold patch (350 lbs.) will be required to fill the holes as is required for each mix design.

3. METHOD OF AWARD

To ensure contractor accountability, the Owner intends to award all items to a single contractor. Accordingly, contractors must bid on all items of work, and the low bidder will be the contractor whose total bid price is the lowest. The bid quantities are not guaranteed, and their primary purpose is for the determination of the low bidder.

4. MEASUREMENT AND PAYMENT

The cost of coring labor, equipment and materials shall be paid per day for each day of coring operations conducted.

ITEM 497.041 Material Sampling (SFDR)

1. DESCRIPTION

Samples of the pavement structure to be reclaimed (existing asphalt pavement, plus the underlying subbase materials) shall be obtained for the full recycling depth. Obtain samples at various locations along the road(s) being recycled to assess the consistency of the existing pavement thickness and the underlying unbound granular materials. Include samples near the centerline, between the wheel paths, and at the pavement edges. If SFDR is to be performed on the paved shoulders, samples shall be taken from them as well. Approximately 350 pounds of correctly proportioned materials (pavement and unbound granulars) are required for each mix design. Mix design materials may be obtained by coring, auger sampling, milling, excavating test

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pits, or a combination of these methods.

Core or Auger Sampling

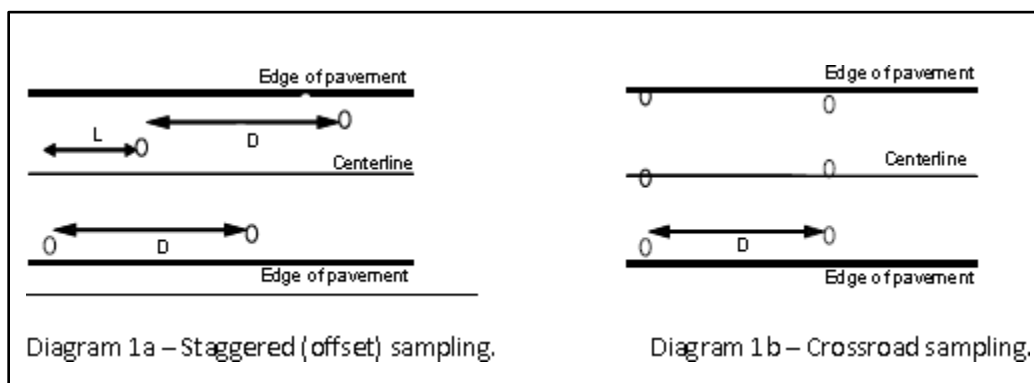
Core or auger samples shall be obtained to the full depth of intended recycling. If a portion of the existing pavement surface is planned to be milled and removed during construction, the thickness of pavement to be milled shall not be included as part of the mix design samples.

Six-inch diameter core samples of the existing pavement shall be obtained by drilling with a water-cooled bit down to the underlying subbase or subgrade soil. If a core breaks off prior to penetrating the underlying granular materials, coring shall continue to the bottom of the pavement for thickness (depth) measurement purposes. On retrieval, each core shall be measured to the nearest 1/8th inch, and then placed in a separate container and labeled. A coring log summarizing the date, station, offset, and core thickness shall be recorded for each core location.

Underlying unbound materials (aggregate subbase and/or subgrade), to the planned reclaiming depth, shall be obtained at each sample location using a bent spoon, hand auger or some other device that prevents asphalt or soil from contaminating the base sample. Carefully scrape the edge of the hole to obtain as much sample as possible. Place the sample in a bag and record the job number and core location on the bag in indelible ink. The depth of the underlying unbound material and notes regarding the general composition of the material shall be recorded in the coring log at the corresponding core location.

Core or auger samples shall be obtained using a pattern that results in a representative sample of the pavement structure to be reclaimed including at or near lane lines, within and between wheel paths, at the pavement edge and within shoulders, if shoulders are to be reclaimed. The roadway shall be sampled in accordance with staggered or offset sampling (Diagram 1a) or crossroad sampling with no offset (Diagram 1b).

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Highways or Airports

D – 1 mile maximum

L – 0.5 mile maximum

- a) At least 15% of the cores shall be in the shoulder, if the shoulder is being reclaimed.
- b) At least 25% of the cores shall be on or within 3 feet of centerline.

Arterial and Industrial Streets

D – 2,000 feet maximum

L – 1,000 feet maximum

- a) At least 25% of the cores shall be in the shoulder, if the shoulder is being reclaimed, or within 3 feet of the gutter.
- b) At least 25% of the cores shall be on or within 3 feet of centerline.

Residential Streets

- a) For streets less than 250 feet long (when grouped with adjacent streets), a minimum of one core plus a sample of the underlying granulars shall be obtained to assess pavement thickness and subbase material type.
- b) For streets 250 feet to 500 feet long (when grouped with adjacent streets), a minimum of two cores and samples of the underlying granulars shall be obtained to assess pavement thickness and subbase material type (one within 3 feet of gutter, and the other within 3 feet of centerline).
- c) For streets over 500 feet long (when grouped with adjacent streets), a minimum of three cores with samples of the underlying granulars shall be obtained to assess pavement thickness and subbase material type (one within 3 feet of gutter, one within 3 feet of centerline, and one between the two).

Milling

Milling of material for sampling purposes may be conducted provided the milling operation only penetrates to the planned reclaiming depth. If a portion of the existing pavement surface is planned to be milled and removed during construction, the depth of the pavement to be milled

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shall not be included as part of the mix design samples. The material may be obtained from one test location for each mix design provided the pavement depth and composition is consistent. For example, if a pavement change exists within the limits of the roadway, one test location shall be designated for each area.

Test Pits

Test pits may be used to obtain representative samples of asphalt pavement and underlying, unbound granular materials. Only materials that represent the pavement to be reclaimed shall be collected. If a portion of the existing pavement surface is planned to be milled and removed during construction, the depth of the pavement to be milled shall not be included as part of the mix design samples. The material may be obtained from one test pit for each mix design provided the depth and composition of the unbound granular material remains consistent. For example, if a change in depth or gradation of the granular material exists within the limits of the roadway, one test pit shall be designated for each area.

2. FILLING SAMPLE HOLES

- a) Each sample hole shall be filled in accordance with the procedures described below. After sampling and filling the holes, the roadway shall be cleaned of all loose debris.
- b) A high-quality cold patch material shall be used to fill core or milling holes. The cold mix shall be compacted flush with a tamping rod, sledge or Marshall hammer. Approximately the same amount of cold patch (350 lbs.) will be required to fill the holes as is required for each mix design.

For milling holes and test pits, hot-mix asphalt may be used as long as the mix is transported in a "hot box" and the mix temperature is maintained throughout the sampling operation.

3. METHOD OF AWARD

To ensure contractor accountability, the Owner intends to award all items to a single contractor. Accordingly, contractors must bid on all items of work, and the low bidder will be the contractor whose total bid price is the lowest. The bid quantities are not guaranteed, and their primary purpose is for the determination of the low bidder.

4. MEASUREMENT AND PAYMENT

The cost of labor, equipment and materials shall be paid per day for each day of material sampling operations conducted.

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ITEM 497.032

Mix Design (CIR)

1. MIXTURE DESIGN

- a) Obtain cored samples for the project mix design. Three hundred and fifty pounds (350 lbs.) of representative material to be recycled is required for each mix design.
- b) An independent laboratory not owned or controlled by the contractor shall develop and submit a Job Mix Formula (JMF) prior to the start of the CIR operation. Develop the JMF conforming to the requirements of Table 1 below.

Table 1 – CIR Minimum Mix Design Requirements for Stabilizing Agents

Test Method		Criteria	
Gradation of Reclaimed Material (Sieve Analysis of Aggregates)	AASHTO T11 & AASHTO T27	Sieve Size	% Passing
		3"	100
		1 ½"	70 – 100
		#200	0 – 10
Bulk Specific Gravity of Compacted Samples	AASHTO T166 or AASHTO T331	Report (Ndes = 30)	
Maximum Theoretical Specific Gravity & Air Voids, % (1.25°, 600kPa, 30gyr)	AASHTO T209	Report	
Indirect Tensile Strength Unconditioned, psi @ 25°C	ASTM D4867	≥ 45 psi	
Indirect Tensile Strength Conditioned, psi @ 25°C	ASTM D4867	≥ 30 psi	
Tensile Strength Ratio, %		Report	
Rap Coating Test	AASHTO T59	Minimum = GOOD	
Foamed Asphalt Expansion Ratio		Minimum 8.0 Times	
Foamed Asphalt Half-life		Minimum 6.0 Seconds	
Minimum Virgin Asphalt Content		1.5 %	

- c) The lab equipment used to simulate the asphalt foaming process and RAP stabilization shall be substantially similar to the contractor's recycling equipment to be used on the project.
- d) The mix design JMF shall be the baseline measure for the rate of stabilizing agent application and water blended with the RAP to construct the CIR mixture. The mix design shall indicate the allowable tolerance for field adjustments for the stabilizing agent and/or

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water so as not to jeopardize the performance of the mix in regard to Table 1 but allow the contractor to adjust the mix in response to field conditions in consultation with the Engineer.

- e) Provide the mix design report with the following minimum information:
- 1) Gradation of RAP
 - 2) Density, maximum specific gravity, air void content, indirect dry tensile strength, indirect wet (conditioned) tensile strength, and tensile strength ratio at each recycling agent content iteration (minimum of 3, inclusive of recommended moisture and stabilizing contents) and at the recommended moisture and stabilizing agent contents
 - 3) Recommended water content range as a percentage of dry RAP
 - 4) Optimum stabilizing agent content as a percentage of dry RAP
 - 5) Stabilizing agent designation, PG grading of asphalt binder, if applicable, supplier name and location, and certificates of compliance
 - 6) Application means of recycling agent
 - 7) Allowable tolerances for field adjustments for stabilizing agent and/or water
 - 8) Portland cement, if needed

2. METHOD OF AWARD

To ensure contractor accountability, the Owner intends to award all items to a single contractor. Accordingly, contractors must bid on all items of work, and the low bidder will be the contractor whose total bid price is the lowest. The bid quantities are not guaranteed, and their primary purpose is for the determination of the low bidder.

3. METHOD OF PAYMENT

Payment for Mix Designs shall be per each mix design required.

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ITEM 497.042 Mix Design (SFDR)

1. MIXTURE DESIGN

- a) Obtain samples from coring, milling, or test pits for the project mix design. Three hundred and fifty pounds (350 lbs.) of representative material to be reclaimed is required for each mix design.
- b) An independent laboratory not owned or controlled by the contractor shall develop and submit a Job Mix Formula (JMF) prior to the start of the Paver-Placed SFDR operation. Develop the JMF conforming to the requirements of Table 2 below.

Table 2 – Paver-Placed FDR Minimum Mix Design Requirements for Stabilizing Agents

Test Method		Criteria	
Gradation of Reclaimed Material (Sieve Analysis of Aggregates)	AASHTO T11 & AASHTO T27	Sieve Size	% Passing
		3"	100
		1 1/2"	70 – 100
		#200	0 – 10
Plasticity Index	ASTM D4318	≤ 20	
Maximum Theoretical Specific Gravity & Air Voids, % (1.25°, 600kPa, 30gyr)		Report	
Maximum Dry Density, pcf Optimum Moisture Content, % Air Voids, %	ASTM D1557	Report	
Indirect Tensile Strength Unconditioned, psi @ 25°C	ASTM D4867	≥ 40 psi	
Indirect Tensile Strength Conditioned, psi @ 25°C	ASTM D4867	≥ 25 psi	
Tensile Strength Ratio, %		Report	
Resilient Modulus, ksi	ASTM D7369	≥ 150ksi	
Cohesimeter @ 1 hour (g/25mm)	ASTM D1560-92		
Foamed Asphalt Expansion Ratio		Minimum 8.0 Times	
Foamed Asphalt Half-life		Minimum 6.0 Seconds	

- c) The lab equipment used to simulate the asphalt foaming process and RAP stabilization shall be substantially similar to the contractor's recycling equipment to be used on the project.
- d) The mix design JMF shall be the baseline measure for the rate of stabilizing agent

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application and water blended with the RAP to construct the Paver-Placed SFDR mixture. The mix design shall indicate the allowable tolerance for field adjustments for the stabilizing agent and/or water so as not to jeopardize the performance of the mix in regard to Table 2 but allow the contractor to adjust the mix in response to field conditions in consultation with the Owner.

e) Provide the mix design report with the following minimum information:

- 1) Gradation of RAP
- 2) Maximum Specific Gravity, Density, & Air Void Content
- 3) Indirect dry tensile strength: Unconditioned (dry), Conditioned (wet), & Tensile Strength Ratio Performed at each foamed asphalt content iteration (minimum of 3)
- 4) Recommended optimum moisture content
- 5) Recommended optimum foamed asphalt content
- 6) PG grade of asphalt binder (Including supplier name and location)
- 7) Recommended temperature, moisture content, and air pressure to achieve required expansion ratio and half-life of foamed asphalt
- 8) Allowable tolerances for field adjustments for stabilizing agent and/or water
- 9) Portland cement content, if needed
- 10) Recommendations for adjusting the blend of recycled material and underlying base aggregate when varying pavement thickness is encountered during the reclaim operation

2. METHOD OF AWARD

To ensure contractor accountability, the Owner intends to award all items to a single contractor. Accordingly, contractors must bid on all items of work, and the low bidder will be the contractor whose total bid price is the lowest. The bid quantities are not guaranteed, and their primary purpose is for the determination of the low bidder.

3. METHOD OF PAYMENT

Payment for Mix Designs shall be per each mix design required.

ITEM 497.01 Cold In-Place Recycling (CIR)

1. DESCRIPTION

This work consists of the full or partial depth milling of the existing HMA pavement to the width and depth specified on the plans, blending the processed material with a foamed asphalt stabilizing agent, water and other additives as necessary and required by the mix design, and placement and compaction of this mixture in accordance with the plans and specifications.

2. MATERIALS

Paver-Placed In-Place Recycling with Foamed Asphalt

a) Reclaimed Asphalt Pavement (RAP) Material

Mill the RAP from the existing roadway and process it in-place.

The RAP shall be free of contamination of concrete, silt, clay, or other deleterious materials.

Remove rubberized crack filler, pavement markers, loop wires, fabric, or other materials as observed from the roadway during the recycling process. Appropriately size and homogenously blend any residual materials with the RAP.

The milled and processed material shall conform to the following gradation prior to addition of the stabilizing agent:

Gradation of Reclaimed Material (Sieve Analysis of Aggregates)	AASHTO T11 & AASHTO T27	Sieve Size	% Passing
		1 ½'	100
		1"	95 – 100

b) Stabilizing Agent (ITEM 4)

The asphalt stabilizing agent shall be Foamed Asphalt.

c) Foamed Asphalt

- 1) Provide asphalt binder performance grade for foamed asphalt of PG 64-22 or PG 64-28.
- 2) Sufficiently heat asphalt binder to meet the mix design expansion and half-life criteria; not to exceed 375° F.
- 3) Asphalt binder shall produce asphalt foam with a minimum expansion ratio of 8 and half-life of no less than 6 seconds.

d) Mineral Filler (ITEM 5)

If required by the mix design, the mineral filler shall be Portland Cement.

e) Water

Provide water added to the RAP for foaming asphalt. Water may be added to the RAP at the milling head and/or in a mixing chamber. Water to be provided by Owner from a nearby hydrant or other suitable source within reasonable distance.

f) Asphalt Pricing and Price Adjustments

- 1) Contractor's bid prices below shall be based upon the current State DOT asphalt cement index posted exactly two (2) weeks prior to the due date for receipt of bids ("Bid Index"). If the posted State DOT asphalt cement index in place when the work is performed differs by more than 5% from the Bid Index, then Contractor's invoices shall include price adjustments for the asphaltic materials based on the actual gallons incorporated into the work.

Paver-Placed In-Place Recycling with Foamed Asphalt

- 2) The owner agency reserves itself the option to extend the use, terms, conditions and prices of this bid for an additional three (3) years after the first year in which the contract is awarded. Such extension will be subject to the Owner reviewing and approving the Contractor's annual request for a price adjustment based on and limited to the prior year's actual rate of inflation. If such price adjustment cannot be mutually agreed upon between the Owner and Contractor, Owner may choose to re-bid the work in lieu of extending this contract.

3. QUALITY MANAGEMENT PROGRAM

a) Personnel

Provide a qualified and certified technician for performance of field density. Certification shall be NETTCP Paving Inspector or equivalent.

b) Equipment

- 1) Furnish the necessary equipment and supplies for performing quality control testing. Ensure that all testing equipment conforms to the equipment specifications applicable to the required testing methods. The Engineer may inspect the measuring and testing devices to confirm both calibration and condition. Calibrate all testing equipment according to the applicable AASHTO and/or ASTM specifications and maintain a calibration record at the laboratory.
- 2) Furnish a nuclear gauge and ensure that the gauge manufacturer or an approved calibration service calibrates the gauge the same calendar year it is used on the project. Retain a copy of the calibration certificate with the gauge.
- 3) Conform to ASTM D 6938 for density testing and gauge monitoring methods.

c) Quality Control (QC) Testing

- 1) Roadway production lots will be defined as one roadway, or a day's production, whichever is less. Each roadway production lot will consist of two or more equally divided sub lots (for example, one subplot per lane).
- 2) Report stabilizing agent foaming properties, if applicable, (i.e. half-life and expansion ratio) at a minimum frequency of 1 per production day.
- 3) Conduct and report mill depth checks at a minimum frequency of 1 per sub lot.
- 4) Report stabilizing agent temperature and application rate at a minimum frequency of 1 per sub lot.
- 5) Conduct and report density testing at a minimum frequency of 3 random tests per sub lot.
- 6) Provide a Daily Inspection Report to the Owner summarizing the: daily beginning and ending stations, applicable mix design, sub lot test (mill depth check, density test, stabilizing agent temperature and application rate) locations and values, lot roadway sample locations, and any adjustments to the application rate of the stabilizing agent or water.
- 7) If stabilizing agent adjustments exceed the allowable limits defined in the mix design or the stabilizing agent application rate is reduced below the 1.5% mix design minimum

Paver-Placed In-Place Recycling with Foamed Asphalt

specified in Table 1, based on a single test or meter adjustment, re-evaluate the entire process. Obtain approval by the Owner before resuming production.

d) Owner Testing

- 1) The owner may conduct quality verification (QV) testing to validate the quality of the product, and independent assurance (IA) testing to evaluate the sampling and testing. The owner will provide the contractor with a listing of names and telephone numbers of all QV and IA personnel for the project and provide test results to the contractor within 5 business days after the owner obtains the sample.
- 2) If the owner identifies a deficiency, and after further investigation confirms it, the contractor shall correct that deficiency. If the contractor does not correct or fails to cooperate in resolving identified deficiencies, the Engineer may suspend placement until action is taken.

4. CONSTRUCTION

a) General

- 1) Unless the contract provides otherwise, keep the road open to traffic during construction.
- 2) Perform CIR operations only between the dates of April 15 and October 15 when the pavement temperature in the shade is above 55°F, when the ambient air temperature approximately 3 feet above grade, in shade, and away from artificial heat sources is above 50°F and rising, and when the nighttime ambient air temperature is above 45°F the night prior and following, unless approved otherwise by the Engineer.
- 3) Do not perform CIR operations during inclement weather such as heavy rain that will not allow proper mixing, placing, and/or compacting of the mixture.
- 4) Complete CIR operations to allow adequate time for placement of the finish wearing course prior to the onset of winter. The finish wearing course should be applied to protect the CIR no later than 30 days after the CIR process is complete.

b) Equipment

- 1) Recycled material from the recycling unit shall be conveyed directly into the paver Equipment used for CIR shall be subject to approval by the Engineer.
- 2) Tankers supplying hot stabilizing agent components shall be equipped to constantly monitor temperature within the tank.
- 3) Portland cement bulk spreader must be fully automated and capable of achieving the application rate specified in the mix design. Portland cement spreader shall also be equipped with a water misting spray bar to reduce the amount of airborne cement dust from the spreading operation.
- 4) The contractor shall provide an area or areas for the contractor to stage their equipment prior to and during construction.

c) Milling Machine

- 1) Utilize milling units not inclusive of pre-mill/wedge-cut milling units capable of milling the existing pavement full lane width (12'- 6" minimum) to the depth shown on the plans, specified in the contract or directed by the Engineer, in a single pass.
- 2) Utilize units equipped with automatic depth control that maintain constant cutting depth and width, uniform grade, and uniform slope.

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- 3) For processes not incorporating additional screening, sizing, or crushing, utilize a milling unit capable of producing RAP sized as specified in B.1.
- 4) Use of a heating device to soften the pavement is not permitted.

d) Mixing Unit

- 1) Processed RAP shall be mixed with the stabilizing agent and water in a mixing unit which shall be the milling machine cutter housing.
- 2) The asphalt stabilizing agent shall be applied uniformly at the predetermined application rate using a computer controlled additive system. Monitor the metering of the stabilizing agent through a calibrated pump providing a continuous readout of quantities.
- 3) The additive system shall contain separate pumping systems for adding stabilizing agent and water. Each system shall have an inspection or test nozzle for stabilizing agent and/or water sampling.
- 4) The additive system shall include a heating system to maintain the PG binder flowing into the mixing chamber at the optimal foaming temperature. The PG binder heating system shall be heated electrically.
- 5) The system shall be capable of producing a uniformly mixed, homogenous recycled pavement mixture.

e) Paving Equipment

- 1) The placement and shaping of the recycled pavement mixture shall be completed using a self-propelled paver, with a minimum 10' and maximum 20' screed width.
- 2) The screed shall not be heated when paving the recycled mix.
- 3) The material shall be transferred directly into the paver hopper from the recycling equipment or with a pick-up device. When a pick-up device is used, the entire windrow shall be removed from the milled surface and transferred to the paver hopper.

f) Compaction Equipment

- 1) Compaction equipment shall be a minimum of 9 tons, self-propelled and include both dual smooth drum vibratory and pneumatic rollers.
- 2) The number and types of rollers shall be as necessary to achieve the specified compaction and surface smoothness required for the finish wearing course.

g) Preparation

- 1) Inspect the pavement surface for any areas of failing subgrade. If needed, repair areas will be saw cut, and all inferior material shall be taken out. Removed materials shall be replaced with clean granular material compacted in lifts not to exceed 6" in thickness, up to within 6" of the road surface. The final 6", bringing the repair to road grade, shall be done with 3/4" hot mix binder.
- 2) If pre-milling to remove the material ahead of recycling is warranted, it will be paid under the "Pre-milling".
- 3) Any blading of the existing roadway shoulders away from the asphaltic surface edge to minimize contamination of the CIR pavement will be the responsibility of the owner.
- 4) Saw cutting cost shall be incidental to the repair. Gravel to be priced by the cubic yard, and hot mix asphalt to be priced by the ton.

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h) Processing and Placement of Recycled Pavement Mixture

- 1) Mill the existing pavement to the required depth and width indicated on the plans.
- 2) Blend the RAP material with the mix design specified proportions of stabilizing agent and water; produce a uniform and homogeneous recycled mixture.
- 3) Spread the recycled mixture to the grade, elevations, and slopes specified on the plans; avoiding tearing or scarring of the recycled pavement surface.
- 4) Ensure proper material transfer, handling, and spreading to prevent particle segregation.
- 5) Overlap longitudinal joints between successive CIR operations a minimum of 3 inches. Overlap transverse joints between successive CIR operations a minimum of 2 feet. Control the addition of foamed asphalt to the CIR in overlap areas in order to avoid excessive localized high asphalt content in the CIR layer.

i) Compaction - Control Strip Construction

- 1) On the first day of production, construct a control strip to identify the target wet density for the CIR layer. Perform the control strip construction and density testing under the direct observation and/or assistance of the Engineer.
- 2) Unless the Engineer approves otherwise, construct control strips to a minimum dimension of 500 feet long and one full lane width.
- 3) Completed control strips may remain in-place to be incorporated into the final roadway cross-section.
- 4) Construct additional control strips at a minimum, when:
 - The CIR layer thickness changes in excess of 2.0 inches, or
 - The percent of target density is less than 90% or exceeds 105.0% and is outside the range of the 10 random measurements defining the control strip, on three consecutive sub lots.
- 5) Construct control strips using equipment and methods representative of the operations to be used for constructing the CIR layer.
- 6) After compacting the control strip with a minimum of 2 passes, mark and take density measurements at 3 random locations, at least 1½ feet from the edge of the CIR layer. Take subsequent density measurements at the same 3 locations.
- 7) After each subsequent pass of compaction equipment over the entirety of the control strip, take density measurements at the 3 marked locations. Continue compacting and testing until the increase in density measurements is less than 2.0 lbs./cubic foot, or the density measurements begin to decrease.
- 8) Upon completion of control strip compaction, take 10 randomly located density

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measurements within the limits of the control strip, at least 1½ feet from the edge of the base. The final measurements recorded at the initial 3 density locations may be included as 3 of the 10 measurements. The target density shall be the average of the 10 measurements obtained.

j) Compaction Requirements

Compact the CIR layer to a required minimum density of 95% of the target density.

k) Surface Requirements

- 1) Test the pavement surface at regular intervals using a 10-foot straightedge or other Engineer-specified device.
- 2) The Engineer may direct the repair of surface deviations greater than 1/4 inch between two surface contact points. Correct high points by reworking, rerolling, trimming, milling, or grinding. Minor depressions greater than 3/4 inch may be corrected by reworking or have a tack coat applied and be filled with HMA immediately prior to placement of the wearing course. For higher speed roads or other locations where the owner may require more stringent surface deviation tolerances than specified above, contractor may be required to do minimal depth profile milling to improve the ride quality ahead of application of the wearing course. If required, this shallow profile milling will be paid under **(ITEM 17)**.

l) Maintaining the Work

- 1) After compaction is complete, determine whether the CIR is sufficiently stable and cured adequately to open to traffic.
- 2) Apply a fog seal to minimize raveling and reduce water intrusion into the recycled pavement by the end of each CIR treatment day. Fog seal shall be a diluted CSS-1h emulsion (50% emulsion, 50% water), or approved equal.
- 3) After opening to traffic, and prior to placing a wearing course, maintain the surface of the recycled pavement in a condition suitable for safe movement of traffic.
- 4) Repair any damage to the recycled pavement prior to placement of the wearing course at no additional cost to the Owner. If Owner elects to have a separate Contractor install the wearing course, and the wearing course is not applied within thirty (30) days of the CIR completion per Section 4.a.4 above, Owner shall relieve the CIR Contractor of responsibility for any repairs that may be required.

m) Keyways and Miscellaneous Milling as a Day Rate

Cutting keyways and miscellaneous milling to provide a smooth transition from the new hot mix paving over the CIR layer to the existing pavement at side roads, intersections, project limits, etc. are to be performed by the paving contractor. In the event the Owner prefers this keyway and miscellaneous milling to be done by the CIR contractor, this work will be performed and paid on a daily rate basis in accordance with bid (ITEM 18), "Keyways and Miscellaneous Milling." The daily rate shall include all milling equipment and labor to perform

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the work but exclude trucking (by Owner or to be paid by the hour, bid (ITEM 6) and shall exclude traffic control.

n) Curing and Surfacing

- 1) Application of a wearing course will not be allowed until the moisture content of the CIR layer is not more than 1.5%.
- 2) If the moisture content of the CIR layer does not reduce to 1.5%, the wearing course may be applied after the change in moisture content is less than 0.10 percentage points for three consecutive calendar days.
- 3) The finish wearing course should be applied as soon as curing is complete, not more than 14 days after the recycling process is complete.
 - Immediately before the application of the finish wearing course, an asphalt emulsion tack coat shall be applied at a minimum rate of 0.05 gal/square yard.
 - Do not use a hot asphaltic cement tack coat.

5. MEASUREMENT AND PAYMENT

Table D.14

DESCRIPTION	UNIT
Cold In-place Recycling (CIR) Including Fog Seal	SY
Liquid Asphalt Stabilizing Agent	GAL
Portland Cement Stabilizing Agent	TON

- a) The owner will measure the Cold In-place Recycling (CIR) bid item as acceptably completed by the square yard.
- b) The owner will measure the Liquid Asphalt and Portland Cement Stabilizing Agents incorporated into the work by the gallon and by the ton, respectively, as metered through a calibrated pump, calibrated auger, or through delivered ticket quantity, acceptably completed.
- c) Payment is full compensation for measured quantities as specified above; all material including mixing and milling water; equipment necessary for milling and sizing, mixing, paving, compacting the completed CIR and fog seal to maintain the completed CIR.
- d) **(ITEM 8)** For roadways where owner elects to have contractor install additional RAP or virgin aggregate on top of the existing pavement ahead of the milling machine to thicken the recycled layer, owner shall furnish and deliver the virgin aggregate or screened and sized RAP (1" minus) to contractor's spreading equipment. RAP or virgin aggregate shall be delivered at a rate adequate not to slow down the subsequent recycling operation. Contractor shall be paid for spreading this additional virgin aggregate or RAP layer by the SY, under the separate bid item "Pave RAP or Aggregate Ahead of Recycler"

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(ITEM 8). A sample of the RAP or virgin aggregate to be used will be supplied to the contractor to develop mix design(s).

e) (ITEM 19) Down Time

If Contractor's daily production is stopped due to no fault of its own (i.e. buried utility structures not identified, parked cars not removed, etc.), the labor and equipment costs incurred during the delay period will be paid at the bid hourly rate.

6. METHOD OF AWARD

- a) To ensure the contractor's capabilities, the bidder shall provide with his bid THEIR evidence of his current State DOT prequalification status, for the categories of work contained herein. Bidder shall also submit with his bid documented experience of at least ten (10) foamed asphalt stabilized CIR jobs totaling a minimum of 250,000 square yards including the street names and limits, year completed, owner agency name and contact information for verification purposes.
- b) To ensure the contractor's capabilities, the bidder shall provide with his bid, evidence of his current State DOT prequalification status, for the categories of work contained herein.

ITEM 497.02

Paver-Placed Stabilized Full Depth Reclamation (SFDR)

1. DESCRIPTION

This work consists of pulverizing the full depth of the existing pavement, blending the pulverized pavement with a predetermined depth of underlying subbase material, a stabilizing agent (foamed asphalt), water and other additives (as specified by the mix design) into a homogenous mixture. This mixture is then placed with a paver and compacted to the depth, grade, and slope specified by the owner and in accordance with these specifications.

2. MATERIALS

a) Reclaimed Asphalt Pavement (RAP) and Underlying Base Material

Mill the RAP from the existing roadway and homogeneously blend it with a predetermined depth of underlying subbase material in one in-place operation. The RAP shall be free of contamination of concrete, silt, clay, or other deleterious materials.

Remove rubberized crack filler, pavement markers, loop wires, fabric, or other materials as observed from the roadway during the recycling process.

The blended material shall conform to the following gradation prior to addition of stabilizing agent:

Paver-Placed In-Place Recycling with Foamed Asphalt

Gradation of Reclaimed Material (Sieve Analysis of Aggregates)	AASHTO T11 & AASHTO T27	Sieve Size	% Passing
		3"	100
		1 ½"	70 – 100
		#200	0 – 10

b) Stabilizing Agent (ITEM 4)

The asphalt stabilizing agent shall be Foamed Asphalt.

c) Foamed Asphalt

- 1) Provide asphalt binder performance grade for foamed asphalt of PG 64-22 or PG 64-28.
- 2) Sufficiently heat asphalt binder to meet the mix design expansion and half-life criteria; not to exceed 350° F.
- 3) Asphalt binder shall produce asphalt foam with a minimum expansion ratio of 8 and half-life of no less than 6 seconds.

d) Mineral Filler (ITEM 5)

If required by the mix design, the mineral filler shall be Portland Cement.

e) Water

Water required for foaming asphalt shall be injected into the asphalt stream via the milling machine's computer controlled foaming system. Water required to facilitate compaction of the blended, stabilized material shall be added at the milling head and/or in a mixing chamber. Water to be provided by Owner from a nearby hydrant or other suitable source.

3. QUALITY MANAGEMENT PROGRAM

a) Personnel

Provide a qualified and certified technician for performance of field density. Certification shall be NETTCP Paving Inspector or equivalent.

b) Equipment

- 1) Furnish the necessary equipment and supplies for performing quality control testing. Ensure that all testing equipment conforms to the equipment specifications applicable to the required testing methods. The Owner may inspect the measuring and testing devices to confirm both calibration and condition. Calibrate all testing equipment according to the applicable AASHTO and/or ASTM specifications and maintain a calibration record at the laboratory.
- 2) Furnish a nuclear gauge and ensure that the gauge manufacturer or an approved calibration service calibrates the gauge the same calendar year it is used on the project. Retain a copy of the calibration certificate with the gauge.

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3) Conform to ASTM D 6938 for density testing and gauge monitoring methods.

c) Quality Control (QC) Testing

- 1) Roadway production lots will be defined as one roadway, or a day's production, whichever is less. Each roadway production lot will consist of two or more equally divided sub lots (for example, one sublot per lane).
- 2) Report stabilizing agent foaming properties, if applicable, (i.e. half-life and expansion ratio) at a minimum frequency of 1 per production day.
- 3) Conduct and report mill depth checks at a minimum frequency of 1 per sub lot.
- 4) Report stabilizing agent temperature and application rate at a minimum frequency of 1 per sub lot.
- 5) Conduct and report density testing at a minimum frequency of 3 random tests per sub lot.
- 6) Provide a Daily Inspection Report to the Owner summarizing the: daily beginning and ending stations, applicable mix design, sub lot test (mill depth check, density test, stabilizing agent temperature and application rate) locations and values, lot roadway sample locations, and any adjustments to the application rate of the stabilizing agent or water.
- 7) If stabilizing agent adjustments exceed the allowable limits defined in the mix design or the stabilizing agent application rate is reduced below the 1.5% mix design minimum specified in Table 2, based on a single test or meter adjustment, re-evaluate the entire process. Obtain approval by the Owner before resuming production.

d) Owner Testing

- 1) The owner may conduct quality verification (QV) testing to validate the quality of the product, and independent assurance (IA) testing to evaluate the sampling and testing. The owner will provide the contractor with a listing of names and telephone numbers of all QV and IA personnel for the project and provide test results to the contractor within 5 business days after the owner obtains the sample.
- 2) If the owner identifies a deficiency, and after further investigation confirms it, the contractor shall correct that deficiency. If the contractor does not correct or fails to cooperate in resolving identified deficiencies, the Owner may suspend placement until action is taken.

4. CONSTRUCTION

a) General

- 1) Unless the contract provides otherwise, keep the road open to traffic during construction.
- 2) Perform SFDR operations only between the dates of April 15 and October 15 when the pavement temperature in the shade is above 55°F, when the ambient air temperature approximately 3 feet above grade, in shade, and away from artificial heat sources is above 50°F and rising, and when the nighttime ambient air temperature is above 45°F the night prior and following, unless approved otherwise by the Owner.

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- 3) Do not perform SFDR operations during inclement weather such as heavy rain that will not allow proper mixing, placing, and/or compacting of the mixture.
- 4) Schedule SFDR operations such that there is sufficient time for curing and placement of the wearing course prior to the onset of winter. The wearing course should be applied to protect the newly stabilized base no later than 30 days after the SFDR process is complete.

b) Equipment

- 1) Recycled material from the recycling unit shall be conveyed directly into the paver. Equipment used for SFDR shall be subject to approval by the Owner.
- 2) Tankers supplying hot stabilizing agent components shall be equipped to constantly monitor temperature within the tank.
- 3) Portland cement bulk spreader must be fully automated and capable of achieving the application rate specified in the mix design. Portland cement spreader shall also be equipped with a water misting spray bar to reduce the amount of airborne cement dust from the spreading operation.
- 4) The Contractor shall provide an area or areas for the contractor to stage their equipment prior to and during construction.

c) Milling Machine

- 1) Utilize milling units not inclusive of pre-mill/wedge-cut milling units capable of milling the existing pavement full lane width in a single pass to the depth shown on the plans, specified in the contract or directed by the Owner. The minimum mechanical power rating of this machine shall be 900 horsepower.
- 2) Utilize units equipped with automatic depth control that maintain constant cutting depth and width, uniform grade, and uniform slope.
- 3) For processes not incorporating additional screening, sizing, or crushing, utilize a down-cutting milling unit capable of producing RAP sized as specified in 2 (a).
- 4) Use of a heating device to soften the pavement is not permitted.

d) Asphalt Foaming and Mixing Unit

- 1) Processed RAP and underlying base gravel shall be mixed with the foamed asphalt stabilizing agent and water in the milling machine cutter housing. The system shall be capable of producing a uniformly blended, homogenous recycled mixture.
- 2) The foamed asphalt stabilizing agent shall be applied uniformly at the predetermined application rate using a computer controlled additive system. Monitor the metering of the stabilizing agent through a calibrated pump providing a continuous readout of quantities.
- 3) The machine shall have two separate systems for adding foamed asphalt and water with each system having a full-width spray bar with a positive displacement pump interlocked to the machine's ground speed to ensure that the amount of foamed asphalt and water being added is automatically adjusted with changes to the machine's forward speed.
- 4) Each additive shall have its own spray bar equipped with individual valves capable of being turned off as necessary to minimize foamed asphalt and water dosing overlap on

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subsequent passes.

5) The foaming system must meet the following requirements:

- a. The foamed asphalt shall be produced at the spray bar in individual expansion chambers into which both the hot asphalt binder and water are injected under pressure through individual and separate orifices that promote atomization. The rate of addition of water into the hot asphalt binder shall be kept at a constant rate (percentage by mass of asphalt binder) by a computerized system.
- b. The machine shall be equipped with an inspection test nozzle that produces a representative sample of foamed asphalt. The test nozzle shall be an exact replica of the foamed asphalt spray bar nozzles.
- c. The system shall have an electrical heating system capable of maintaining the temperature of all foamed asphalt flow components at the optimal foaming temperature and above 320°F.
- d. The machine shall utilize a single asphalt binder feed line installed between the recycler and the supply tanker. Circulating systems that incorporate a return line to the supply tanker shall not be used.
- e. The foam injection system must have a continual self-cleaning feature enabled during the process to ensure all injectors are operational.

e) Paving Equipment

- 1) The placement and shaping of the recycled mixture shall be completed using a self-propelled paver with a minimum 10' and maximum 20' screed width.
- 2) Screed vibrators and/or tamper bars shall be used throughout the placement operation.
- 3) The screed shall not be heated when paving the recycled mix.
- 4) The material shall be transferred directly into the paver hopper from the recycling equipment.

f) Compaction Equipment

- 1) Compaction equipment shall be a minimum of 12 tons, self-propelled and include both dual smooth drum vibratory and pneumatic rollers.
- 2) The number and types of rollers shall be as necessary to achieve the specified compaction and surface smoothness required for the finish wearing course.

g) Preparation

- 1) Inspect the pavement surface for any areas of failing subgrade. If needed, repair areas will be saw cut, and all inferior material shall be taken out. Removed materials shall be replaced with clean granular material compacted in lifts not to exceed 6" in thickness, up to within 6" of the road surface. The final 6", bringing the repair to road grade, shall be done with 3/4" hot mix binder. Saw cutting cost shall be incidental to the repair. Gravel to be priced by the cubic yard, and hot mix asphalt to be priced by the ton.
- 2) If pre-milling to remove the material ahead of recycling is warranted, it will be paid under the

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“Pre-milling”.

- 3) Any blading of the existing roadway shoulders away from the existing pavement surface edge to minimize contamination of the SFDR mixture will be the responsibility of the owner.
- 4) Any trimming and clearing of low tree branches and brush removal that may impede operations or mobilization of SFDR vehicles and equipment will be the responsibility of the owner.

h) Processing and Placement of Recycled Mixture

- 1) Mill the existing pavement and underlying subbase granulars to the required depth and width indicated on the plans.
- 2) Blend the RAP/Subbase granular material with stabilizing agent and water in the proportions specified in the mix design. The resultant recycled mixture shall be homogeneous and uniform across the width of the milling machine. If the depth of pavement changes by more than 20%, adjustments to the recycle depth and/or amount of stabilizing agent added may be warranted. The recommendations contained within the mix design shall be followed when making these adjustments.
- 3) Moisture control shall be achieved by injecting sufficient quantities of water through a spray bar in the mixing drum to achieve the required moisture content for the foamed asphalt FDR mixture. The system shall be capable of maintaining moisture contents within the specified range. Application of moisture directly by a water truck with a spray bar will not be allowed.
- 4) Transfer the SFDR mixture to the paver hopper directly from the conveyor of the milling machine. Spread the recycled mixture to the grade, elevation, and slope specified on the plans.
- 5) Ensure proper material transfer, handling, and spreading to prevent particle segregation.
- 6) Overlap longitudinal joints between successive SFDR operations a minimum of 3 inches. Overlap transverse joints between successive SFDR operations a minimum of 2 feet. Control the addition of foamed asphalt and compaction water within overlap areas to avoid excessive, localized high asphalt content and/or high moisture content in the SFDR layer.

i) Compaction - Control Strip Construction

- 1) On the first day of production, construct a control strip to identify the target wet density for the SFDR layer. Perform the control strip construction and density testing under the direct observation and/or assistance of the Owner.
- 2) Unless the Owner approves otherwise, construct control strips to a minimum dimension of 500 feet long and one full lane width.
- 3) Completed control strips may remain in-place to be incorporated into the final roadway cross-section.
- 4) Construct additional control strips at a minimum, when:

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- The SFDR layer thickness changes in excess of 2.0 inches, or
 - The percent of target density is less than 90% or exceeds 105.0%, and is outside the range of the 10 random measurements defining the control strip, on three consecutive sub lots.
- 5) Construct control strips using equipment and methods representative of the operations to be used for constructing the SFDR layer.
 - 6) After compacting the control strip with a minimum of 2 passes, mark and take density measurements at 3 random locations, at least 1½ feet from the edge of the SFDR layer. Take subsequent density measurements at the same 3 locations.
 - 7) After each subsequent pass of compaction equipment over the entirety of the control strip, take density measurements at the 3 marked locations. Continue compacting and testing until the increase in density measurements is less than 2.0 lbs./cubic foot, or the density measurements begin to decrease. Record the final density at the three locations.
 - 8) Determine the density at 10 random locations within the control strip, at least 1½ feet from the edge of the FDR layer. The final measurements recorded at the initial 3 density locations may be included as 3 of the 10 measurements. The target density shall be the average of the 10 measurements obtained.

j) Compaction Requirements

Compact the SFDR layer to a required minimum density of 95% of the target density.

k) Surface Requirements

- 1) Test the pavement surface at regular intervals using a 10-foot straightedge or other Owner-specified device.
- 2) The Owner may direct the repair of surface deviations greater than 1/4 inch between two surface contact points. Correct high points by reworking, re-rolling, trimming, milling, or grinding. Minor depressions greater than 3/4 inch may be corrected by reworking or have a tack coat applied and be filled with HMA immediately prior to placement of the surface treatment. For higher speed roads or other locations where the owner may require more stringent surface deviation tolerances than specified above, contractor may be required to do minimal depth profile milling to improve the ride quality ahead of application of the wearing course. If required, this shallow profile milling will be paid under **(ITEM 17)**.

l) Maintaining the Work

- 1) After compaction is complete, determine whether the SFDR is sufficiently stable and cured adequately to open to traffic.
- 2) Apply a fog seal to minimize raveling and reduce water intrusion into the recycled SFDR layer by the end of each production day. Fog seal shall be a diluted CSS-1h emulsion (50% emulsion, 50% water), or approved equal.
- 3) After opening to traffic, and prior to placing a surface treatment, maintain the surface of the recycled pavement in a condition suitable for safe movement of traffic.
- 4) Repair any damage to the recycled pavement prior to placement of the wearing course at no additional cost to the Owner. If Owner elects to have a separate Contractor install

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the wearing course, and the wearing course is not applied within thirty (30) days of the SFDR completion per Section 4.a.4 above, Owner shall relieve the SFDR Contractor of responsibility for any repairs that may be required.

m) Keyways and Miscellaneous Milling as a Day Rate

Cutting keyways and miscellaneous milling to provide a smooth transition from the new hot mix paving over the SFDR layer to the existing pavement at side roads, intersections, project limits, etc. are to be performed by the paving contractor. In the event the Owner prefers this keyway and miscellaneous milling to be done by the SFDR contractor, this work will be performed and paid on a daily rate basis in accordance with bid **(ITEM 18)**, "Keyways and Miscellaneous Milling." The daily rate shall include all milling equipment and labor to perform the work but exclude trucking (by Owner or to be paid by the hour, bid **(ITEM 6)**) and shall exclude traffic control.

n) Curing and Surfacing

The SFDR shall be allowed to cure for a minimum of 2 calendar days before placing the surface course, and not more than 14 days after the recycling process is complete.

- Immediately before the application of the wearing course, an asphalt emulsion tack coat shall be applied at a minimum rate of 0.05 gal/SY.
- Do not use a hot asphaltic cement tack coat.

o) Down Time

If Contractor's daily production is stopped due to no fault of its own (i.e. buried utility structures not identified, parked cars not removed, etc.), the labor and equipment costs incurred during the delay period will be paid at the bid hourly rate **(ITEM 19)**.

5. MEASUREMENT AND PAYMENT

Table D.14

DESCRIPTION	UNIT
Paver-Placed Stabilized Full Depth Reclamation (SFDR) Including Fog Seal	SY
Liquid Asphalt Stabilizing Agent	GAL
Portland Cement Stabilizing Agent	TON

- a) The owner will measure the SFDR bid item as acceptably completed by the square yard.
- b) The owner will measure the Liquid Asphalt and Portland Cement Stabilizing Agents incorporated into the work by the gallon and by the ton, respectively, as metered through a

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calibrated pump, calibrated auger, or through delivered ticket quantity, acceptably completed.

- c) Payment is full compensation for measured quantities as specified above; all material including mixing and milling water; equipment necessary for milling and sizing, mixing, paving, compacting the completed SFDR and fog seal to maintain the completed SFDR.
- d) For roadways where owner elects to have contractor install additional RAP or virgin aggregate on top of the existing pavement ahead of the milling machine to thicken the recycled layer, the owner shall furnish and deliver the virgin aggregate or screened and sized RAP (1" minus) to contractor's spreading equipment. RAP or virgin aggregate shall be delivered at a rate adequate not to slow down the subsequent recycling operation. Contractor shall be paid for spreading this additional virgin aggregate or RAP layer by the SY, under the separate bid item "Pave RAP or Aggregate Ahead of Recycler" **(ITEM 8)**. A sample of the RAP or virgin aggregate to be used will be supplied to the contractor to develop mix design(s).

6. METHOD OF AWARD

- a) To ensure contractor accountability, the Owner intends to award all items to a single contractor. Accordingly, contractors must bid on all items of work, and the low bidder will be the contractor whose total bid price is the lowest. The bid quantities are not guaranteed, and their primary purpose is for the determination of the low bidder.
- b) To ensure the contractor's capabilities, the bidder shall provide with his bid evidence of his current State DOT prequalification status, for the categories of work contained herein. Bidder shall also submit with his bid documented experience of recycling pavements using foamed asphalt. At least ten (10) foamed asphalt stabilized jobs totaling a minimum of 250,000 square yards, including the street names and limits, year completed, owner agency name and contact information, shall be submitted for verification purposes.

7. ASPHALT PRICING AND PRICE ADJUSTMENTS

- a) **Asphalt Price Adjustments:** Contractor's bid prices below shall be based upon the current State DOT asphalt cement index posted exactly two (2) weeks prior to the due date for receipt of bids ("Bid Index"). If the posted State DOT asphalt cement index in place when the work is performed differs by more than 5% from the Bid Index, then Contractor's invoices shall include price adjustments for the asphaltic materials based on the actual gallons incorporated into the work.
- b) **Future Year Price Adjustments:** The owner agency reserves itself the option to extend the use, terms, conditions, and prices of this bid for an additional three (3) years after the first year in which the contract is awarded. Such extension will be subject to the Owner reviewing and approving the Contractor's annual request for a price adjustment based on and limited to the prior year's actual rate of inflation. If such price adjustment cannot be mutually agreed upon between the Owner and Contractor, Owner may choose to re-bid the work in lieu of extending this contract.

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ITEM 497.05

Pre-Milling Pavement

1. DESCRIPTION

Work under this item shall be done in conjunction with the CIR or SFDR. The work shall consist of removing, by cold-planer, asphalt pavement in designated areas. The milled material shall become the property of the owner to be disposed of or recycled.

2. EQUIPMENT

- a) The cold-planer, and any other motorized vehicular equipment, shall be equipped with taillights, headlights, and necessary reflectors so that they can be operated in traffic with complete safety.
- b) The cold-planing machine shall be adjustable as to crown and minimum depth of 1/8". The width of the cutting drum shall be a minimum of 51"
- c) The equipment shall be capable of accurately and automatically establishing profile grade along each edge of the machine (within 1/8-inch, more or less) by referencing from the existing pavement by means of a ski or matching shoe controlling cross slope at a given rate.
- d) The machine shall be capable of being operated at speeds from 18 to 40 feet per minute and designed so that the operator can, at all times, observe the operations without leaving his control area.
- e) The equipment furnished by the contractor shall be in good repair and shall be maintained so as to produce a clean cut into the pavement at all times.
- f) The machine shall be equipped with an integral loading and reclaiming means to immediately remove material being cut from the surface of the roadway and discharge the cuttings into a truck, all in one operation. All planing machinery shall be equipped with dust control devices to prevent any dust produced in the cutting operation from escaping into the air, in compliance with EPA air quality standards. The equipment shall meet the standards set by the Air Quality Act for noise and pollution. This machine shall be equipped with a floating moldboard cutting device which is behind the mandrel, and such moldboard must have an infinitely variable down pressure from 0-300 PSI.

3. CONSTRUCTION METHOD

- a) The cold planing machine shall be delivered to the project limits on a trailer. The machine shall be loaded on to the trailer to be transferred from work site to work site. The owner shall not "walk" the machine to the next site unless prior approval from the Engineer is granted.
- b) Once the cold-planing process has begun, the contractor is obliged to carry this effort forward without interruption, yet in accordance with all work hour restrictions unless otherwise directed by the Engineer
- c) Cold-planing operations shall not be limited to just the primary roadway surface, but shall also extend into the adjacent intersections as well. The limit of this work shall be determined in the field by the Engineer so as to best meet the existing conditions and to further provide

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for a smooth pavement transitioning.

- d) No asphalt millings shall remain on-site at the end of each day. Material resulting from the operation shall become the property of the owner and disposed of at an owner-furnished disposal site. Existing catch basins shall be protected in place to not allow loose material to enter structures.
- e) Owner to provide trucking of pre-millings from the project. If contractor is required to provide trucking of pre-millings, it will be paid for under **(ITEM 6)** – Trucking.

4. METHOD OF AWARD

To ensure contractor accountability, the Owner intends to award all items to a single contractor. Accordingly, contractors must bid on all items of work, and the low bidder will be the contractor whose total bid price is the lowest. The bid quantities are not guaranteed, and their primary purpose is for the determination of the low bidder.

5. MEASUREMENT AND PAYMENT

Pre-Milling: The bid price per LF will be multiplied by the number of inches of depth milled to calculate the final payment amount per square yard. TOTAL Linear Feet

Payment for this item is only required when the pre-milling is being done to remove material in order to maintain or control final paving grades. If the pre-milling is done solely for the Contractor's convenience to recycle pavement areas wider than the drum on the recycler (12'-6" minimum), no payment shall be made for pre-milling and the additional recycled roadway width will be paid for under **ITEM 3**, "Cold-in-Place Recycling (CIR) including fog seal" or **ITEM 3A**, "Paver-Place Stabilized Full Depth Reclamation (SFDR) Including Fog Seal."

M26-2 Cold In Place Resurfacing

THE BIDDER MUST FILL IN THESE UNIT PRICES. Also carry out all extensions and fill in "Computed Totals."

In case of error or discrepancies, UNIT PRICES govern and written works take precedence over figures.

ITEM NUMBER AND DESCRIPTION		ESTIMATED QUANTITY	COMPUTED TOTALS
116.0000	EXCAVATION		

	_____ Dollars	40.00	\$ _____
	(\$ _____) CY		
126.0000	GRAVEL BORROW		

	_____ Dollars	48.00	\$ _____
	(\$ _____) CY		
128.0000	SCREENED LOAM BORROW		

	_____ Dollars	1,137.00	\$ _____
	(\$ _____) CY		
156.0000	SEEDING		

	_____ Dollars	6,866.00	\$ _____
	(\$ _____) SY		
235.0000	CATCH BASIN FRAME & GRATE		

	_____ Dollars	24.00	\$ _____
	(\$ _____) EA		
236.0000	MANHOLE FRAME & COVER		

	_____ Dollars	100.00	\$ _____
	(\$ _____) EA		
245.0000	GRANITE INLET STONE		

	_____ Dollars	10.00	\$ _____
	(\$ _____) EA		
245.1000	EXISTING GRANITE INLET STONE REMOVE & RESET		

	_____ Dollars	95.00	\$ _____
	(\$ _____) EA		
246.0000	8 INCH GREEN TRAPS		

	_____ Dollars	8.00	\$ _____
	(\$ _____) EA		

M26-2 Cold In Place Resurfacing

ITEM NUMBER AND DESCRIPTION		ESTIMATED QUANTITY	COMPUTED TOTALS
249.0000	CATCH BASIN CLEANING		
		Dollars	105.00 \$
	(\$) EA		
250.0000	MANHOLE FRAMES, REMOVE, PLATE & RETAIN		
		Dollars	176.00 \$
	(\$) EA		
252.1000	MANHOLE ADJUSTMENT 12 INCH OR LESS GRAVEL		
		Dollars	24.00 \$
	(\$) EA		
252.2000	MANHOLE ADJUSTMENT 12 INCH OR LESS RIGID		
		Dollars	2.00 \$
	(\$) EA		
254.1000	CATCH BASIN ADJUST TO LINE AND/OR GRADE 12 INCH OR LESS, GRAVEL		
		Dollars	81.00 \$
	(\$) EA		
255.1000	CATCH BASIN ADJUST TO LINE AND/OR GRADE 12 INCH OR OVER, GRAVEL		
		Dollars	24.00 \$
	(\$) VI		
304.0300	ADJUST CURB STOP TO GRADE		
		Dollars	16.00 \$
	(\$) EA		
304.0400	REPLACING 4" - 12" GATE VALVE BOX, GRAVEL BASE		
		Dollars	18.00 \$
	(\$) EA		
304.0600	REMOVE AND RETAIN WATER BOX		
		Dollars	21.00 \$
	(\$) EA		

M26-2 Cold In Place Resurfacing

ITEM NUMBER AND DESCRIPTION	ESTIMATED QUANTITY	COMPUTED TOTALS
304.0800 WATER BOX ADJUST TO GRADE, GRAVEL BASE		
_____ Dollars	4.00	\$ _____
(\$ _____) EA		
310.6000 HYDRANT PAINTING		
_____ Dollars	16.00	\$ _____
(\$ _____) EA		
405.0000 STRAIGHT CURB (VA-4)		
_____ Dollars	20.00	\$ _____
(\$ _____) LF		
414.1000 GRANITE EDGE REMOVE & RESET		
_____ Dollars	10,200.00	\$ _____
(\$ _____) LF		
416.0000 CURB REMOVE AND RESET		
_____ Dollars	1,400.00	\$ _____
(\$ _____) LF		
422.2000 SUPERPAVE 12.5 MM LEVEL 2		
_____ Dollars	7,845.00	\$ _____
(\$ _____) TN		
424.0000 BITUMINOUS CONCRETE DRIVEWAY & VARIOUS AREA		
_____ Dollars	190.00	\$ _____
(\$ _____) TN		
430.0000 EXISTING BITUMINOUS CONCRETE DRIVEWAY REPAIR		
_____ Dollars	592.00	\$ _____
(\$ _____) SY		
432.0000 EXISTING BITUMINOUS CONCRETE SIDEWALKS REPAIR		
_____ Dollars	1,634.00	\$ _____
(\$ _____) SY		

M26-2 Cold In Place Resurfacing

ITEM NUMBER AND DESCRIPTION		ESTIMATED QUANTITY	COMPUTED TOTALS
442.0000	CONCRETE SIDEWALK REPAIR		
		Dollars	500.00 \$
	(\$) SY		
446.1000	CLASS B CONCRETE FOR ROADWAY BASE (3,500 P.S.I. 1-1/2 520)		
		Dollars	500.00 \$
	(\$) CY		
450.0000	BOUNDS, REMOVE & RESET		
		Dollars	7.00 \$
	(\$) EA		
454.0000	WHEELCHAIR RAMP CEMENT CONCRETE - 6" THICK WITH DETECTABLE WARNING PANELS		
		Dollars	850.00 \$
	(\$) SY		
485.0000	REMOVE AND RETAIN GAS BOX		
		Dollars	4.00 \$
	(\$) EA		
486.0000	RETURN AND RESET GAS BOX		
		Dollars	4.00 \$
	(\$) EA		
497.0100	COLD IN PLACE RECYCLING (CIR)		
		Dollars	65,500.00 \$
	(\$) SY		
497.0310	CORE SAMPLING - CIR		
		Dollars	5.00 \$
	(\$) Day		
497.0320	MIX DESIGN - CIR		
		Dollars	9.00 \$
	(\$) EA		

M26-2 Cold In Place Resurfacing

ITEM NUMBER AND DESCRIPTION		ESTIMATED QUANTITY	COMPUTED TOTALS
497.0410	MATERIAL SAMPLING - SFDR		
		Dollars	5.00 \$
	(\$) Day		
497.0500	PRE MILLING		
		Dollars	65,500.00 \$
	(\$) LF		
501.0000	4 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC)		
		Dollars	30,462.00 \$
	(\$) LF		
502.0000	4 INCH REFLECTORIZED YELLOW LINE (THERMOPLASTIC)		
		Dollars	2,841.00 \$
	(\$) LF		
503.0000	12 INCH REFLECTORIZED WHITE LINE (THERMOPLASTIC)		
		Dollars	17,914.00 \$
	(\$) LF		
504.0000	PAVEMENT ARROW/LEGEND REFLECTORIZED WHITE (THERMOPLASTIC)		
		Dollars	37.00 \$
	(\$) EA		
505.0000	4 INCH REFLECTORIZED WHITE LINE (WATERBORNE)		
		Dollars	3,710.00 \$
	(\$) LF		
506.0000	4 INCH REFLECTORIZED YELLOW LINE (WATERBORNE)		
		Dollars	1,894.00 \$
	(\$) LF		
507.0000	12 INCH REFLECTORIZED WHITE LINE (WATERBORNE)		
		Dollars	1,026.00 \$
	(\$) LF		

M26-2 Cold In Place Resurfacing

ITEM NUMBER AND DESCRIPTION		ESTIMATED QUANTITY	COMPUTED TOTALS
509.0100	BICYCLE LANE SYMBOLS		
		Dollars	45.00 \$
	(\$) EA		
509.0500	GREEN FRICTION SURFACE ELEPHANT FEET CROSSING WITH LAYOUT		
		Dollars	947.00 \$
	(\$) LF		
519.0000	LIGHTED VARIABLE MESSAGE BOARD		
		Dollars	15.00 \$
	(\$) Day		
520.0000	WARNING AND REGULATORY SIGNS		
		Dollars	12.00 \$
	(\$) EA		
521.0000	TYPE "A" STREET NAME SIGNS		
		Dollars	2.00 \$
	(\$) EA		
522.0000	TYPE "B" STREET NAME SIGNS		
		Dollars	4.00 \$
	(\$) EA		
523.0000	TRAFFIC SIGN POLES		
		Dollars	8.00 \$
	(\$) EA		
900.0000	Lump Sum Reserve		
	three hundred sixty thousand four hundred thirty-six and xx / 100	Dollars	\$ 360,436.00
953.2020	SILT SACK		
		Dollars	95.00 \$
	(\$) EA		

TOTAL BID PRICE INCLUDING CONTINGENCY

_____ Dollars and _____ Cents
(amount in words)

\$ _____
(amount in figures)

This proposal is based on provisions of the following addenda:

No. _____	No. _____
No. _____	No. _____

All amounts and totals given above will be subject to verification by the City. In case of variation between Unit Bid Price and Totals shown by the Bidder, the Unit Price written in words will be considered to be the bid.

The City reserves the right to reject any and all bids, wholly or in part, and to make awards in a manner deemed in the best interests of the City.

The above estimated quantities form an approximate statement of the extent of the work to be done, based upon the estimate of the Contracting Officer. The City does not expressly or by implication agree that the actual quantity of work will correspond therewith, but reserves the right to increase or decrease the quantity of any class or portion of the work, as may be deemed necessary by the Contracting Officer.