Alternative bid for Cold Crackfiller and Restorative & Preservative Sealing, as provided for under the Bid Specifications, Section I. Modification to General Terms and Conditions, under the heading "INTENT", second paragraph. No pricing is offered for any hot pour methods. Bid exceptions are included in this alternative submission.

ALTERNATE #1 – CRF® COLD CRACK FILLER (CCCF)

Description: Cracks and other pavement imperfections do not have to be prepared before the **CRF® Cold Crack Filler** application (see information attached). **CCCF** shall be applied into the cracks with sufficient surface over-banding. Cover material is required and shall be adequately mounded and overlapped to blot out the **CCCF** emulsion. After placement of the cover material, the roadway may be immediately opened to traffic.

Scope and Purpose of the Cover Material: The cover material selected shall be introduced into the **CCCF** for the following purposes:

- The cover material will compact over time, becoming incorporated into the **CCCF** resulting in a less elevated condition. A cover material consisting of a smaller particle size may also be utilized to reduce or eliminate the potential for a rough ride.
- Curing of the **CCCF** may be accelerated by preheating the cover material.
- Dust may also be reduced or eliminated by the increased or exclusive use of sand as the cover material.
- The cover material will gradually become encapsulated into the **CCCF** emulsion. This ongoing process enhances the physical properties and consequently the overall performance of the **CCCF** liquid. The resulting coalesced filler will decrease moisture penetration, increase flexibility and provide stress relief.
- The cover material(s) will also assist in retarding cracks from reflecting through new surfaces like bituminous concrete.

Appropriate cover materials will be selected and furnished by the municipality. All cover materials shall be suitably proportioned to enhance the sealing of large cracks, shallow potholes, or small de-laminations. In cold weather if water impermeable small surface shrinkage cracks appear within the matrix of the sealed area, they will reseal with the kneading effect of traffic in warmer temperatures.

Equipment
Contractor will furnish the specified liquid **CCCF** crack sealing material. The installation crew will be provided by the Municipality and or subcontracted labor crews. The equipment shall be capable of carrying a sufficient daily requirement of **CCCF** in a pressurized dispenser(s) with a total minimum capacity of between 300 and 325 gallons tested at 50 pounds pressure. These dispensers shall each have the following safety features:

- SET REGULATOR AT 25 - 45 POUNDS PRESSURE
- CERTIFIED PRESSURE RELEASE VALVE
- COMPRESSOR TANK WITH QUICK COUPLERS TO LOCK INTO THE REGULATOR
- MINIMUM TRIPLE LOOP SLOSH TUBE
- PRESSURIZED FILL CAP
- PETCOCK WITH EXTENDABLE ARM OVER THE PRESSURE CAP

- "T" CLAMP ON BOTTOM OF THE DISPENSER TANK
- APPROXIMATELY 60-FEET OF 5/8INCH FLEXIBLE HOSE
- DISPENSER WAND WITH "ON" AND "OFF" CONTROLS AT THE HANDLE

ALTERNATE #1.2 – COLD CRACKFILLING - 2-MAN CREW

Description: Cracks and other pavement imperfections do not have to be prepared before the **CCCF** application (see information attached). **CCCF** shall be applied into the cracks with sufficient surface over-banding. Cover material is required and shall be adequately mounded and overlapped to blot out the **CCCF** asphalt emulsion. After placement of the cover material, the roadway may be immediately opened to traffic.

Scope and Purpose of the Cover Material: The cover material selected shall be introduced into the **CCCF** for the following purposes:

- The cover material will compact over time, becoming incorporated into the **CCCF** resulting in a less elevated condition. A cover material consisting of a smaller particle size may also be utilized to reduce or eliminate the potential for a rough ride.
- Curing of the **CCCF** may be accelerated by preheating the cover material.
- Dust may also be reduced or eliminated by the increased or exclusive use of sand as the cover material.
- The cover material will gradually become encapsulated into the **CCCF** emulsion. This ongoing process enhances the physical properties and consequently the overall performance of the **CCCF** liquid. The resulting coalesced filler will decrease moisture penetration, increase flexibility and provide stress relief.
- The cover material(s) will also assist in retarding cracks from reflecting through new surfaces like bituminous concrete.

Appropriate cover materials will be selected and furnished by the municipality. All cover materials shall be suitably proportioned to enhance the sealing of large cracks, shallow potholes, or small de-laminations (see manufacturer's recommendations attached). In cold weather if water impermeable small surface shrinkage cracks appear within the matrix of the sealed area, they will reseal with the kneading effect of traffic in warmer temperatures.

Equipment

Contractor will furnish and apply the specified liquid **CCCF** crack sealing material. This crew shall consist of one fully equipped dump/tank truck with an appropriately licensed truck driver together with a laborer to operate the hand wand. The truck shall be capable of carrying a sufficient daily requirement of **CCCF** in pressurized dispenser(s) with a total minimum capacity of between 300 and 325 gallons tested at 50 pounds pressure. These dispensers shall each have the following safety features:

- SET REGULATOR AT 25 - 45 POUNDS PRESSURE
- CERTIFIED PRESSURE RELEASE VALVE
- COMPRESSOR TANK WITH QUICK COUPLERS TO LOCK INTO THE REGULATOR
- MINIMUM TRIPLE LOOP SLOSH TUBE
- PRESSURIZED FILL CAP
- PETCOCK WITH EXTENDABLE ARM OVER THE PRESSURE CAP
- "T" CLAMP ON BOTTOM OF THE DISPENSER TANK
- APPROXIMATELY 60-FEET OF 5/8INCH FLEXIBLE HOSE
- DISPENSER WAND WITH "ON" AND "OFF" CONTROLS AT THE HANDLE

ALTERNATE #1.3 – COLD CRACKFILLING - 4-MAN CREW

Description: Cracks and other pavement imperfections do not have to be prepared before the **CCCF** application (see information attached). **CCCF** shall be applied into the cracks with sufficient surface over-banding. Cover material is required and shall be adequately mounded and overlapped to blot out the **CCCF** petroleum emulsion. After placement of the cover material, the roadway may be immediately opened to traffic.

Scope and Purpose of the Cover Material: The cover material selected shall be introduced into the **CCCF** for the following purposes:

- The cover material will compact over time, becoming incorporated into the **CCCF** resulting in a less elevated condition. A cover material consisting of a smaller particle size may also be utilized to reduce or eliminate the potential for a rough ride.
- Curing of the **CCCF** may be accelerated by preheating the cover material.
- Dust may also be reduced or eliminated by the increased or exclusive use of sand as the cover material.
- The cover material will gradually become encapsulated into the **CCCF** emulsion. This ongoing process enhances the physical properties and consequently the overall performance of the **CCCF** liquid. The resulting coalesced filler will decrease moisture penetration, increase flexibility and provide stress relief.
- The cover material(s) will also assist in retarding cracks from reflecting through new surfaces like bituminous concrete.

Appropriate cover materials will be selected and furnished by the municipality. All cover materials shall be suitably proportioned to enhance the sealing of large cracks, shallow potholes, or small de-laminations (see manufacturer's recommendations attached). In cold weather if water impermeable small surface shrinkage cracks appear within the matrix of the sealed area, they will reseal with the kneading effect of traffic in warmer temperatures.

Equipment
Contractor will furnish and apply the specified liquid **CCCF** crack sealing material. This crew shall consist of one fully equipped dump/tank truck with an appropriately licensed truck driver together with three laborers to operate the hand wand and apply the cover materials. Contractor The truck shall be capable of carrying cover material and a sufficient daily requirement of **CCCF** in pressurized dispenser(s) with a total minimum capacity of between 300 and 325 gallons tested at 50 pounds pressure. These dispensers shall each have the following safety features:

- SET REGULATOR AT 25 - 45 POUNDS PRESSURE
- CERTIFIED PRESSURE RELEASE VALVE
- COMPRESSOR TANK WITH QUICK COUPLERS TO LOCK INTO THE REGULATOR
- MINIMUM TRIPLE LOOP SLOSH TUBE
- PRESSURIZED FILL CAP
- PETCOCK WITH EXTENDABLE ARM OVER THE PRESSURE CAP
- "T" CLAMP ON BOTTOM OF THE DISPENSER TANK
- APPROXIMATELY 60-FEET OF 5/8INCH FLEXIBLE HOSE
- DISPENSER WAND WITH "ON" AND "OFF" CONTROLS AT THE HANDLE

ALTERNATE #2.1 – MODIFIED ASPHALT PENETRATING EMULSION

MECHANICAL APPLICATION OF CRF® CCCF

Scope: To prevent and seal existing hairline cracks in asphalt pavements. In addition, the **CCCF** will also increase the ductility and penetration value of the asphalt binder in the pavement surface, while offsetting the effects of oxidation and raveling on old and new sections of bituminous pavements.

Application:

A. The municipality shall remove all old and/ or foreign matter and other debris from areas to be sprayed, providing a clean surface. No material shall be applied when the surface is damp or where frost, snow or ice is present nor where the ambient temperature is below 32° F.
B. A predetermined job mix formula consisting of a site specific formulation of the attached specified **CCCF** shall be uniformly applied curb to curb on the pavement by mechanical means utilizing an appropriate distributor truck. Post application, the liquid may be dispersed by broom as necessary into ensure that all surface voids are filled and the surface tension of the emulsion is broken. Only then shall the cover material(s) be furnished and applied by the municipality at a rate sufficient to uniformly cover all treated areas. If required, the contractor will also be responsible to broom the cover material if a more even distribution is desired. The pavement shall be immediately opened to traffic upon satisfactory distribution of the cover material(s) as directed. The actual formulation, rate of application and cover material to be utilized will be as directed by the individual municipality with experienced contractor field testing and input
C. Work locations and areas to be treated will be specifically delineated in the field by an authorized municipal representative.
D. The municipality shall supply traffic control and any necessary barricades, cones, warning signs, flagmen, etc. including all cover materials and application thereof including any necessary post application cleanup.

Equipment - A suitable asphalt distributor truck with a minimum capacity of 1,500 gallons, designed, equipped and normally used to apply the CCCF uniformly at various widths, and at predetermined rates of application ranging from approximately 0.05 to 0.15 gallons per square yard is required. The contractor shall furnish and mechanically apply the job mix formula of **CCCF** curb to curb, or as directed. The mechanical application crew shall consist of two truck drivers, the specified distributor truck and a utility truck which may also serve to adequately broom the surface as necessary.

Cover Material: The cover materials shall be selected and provided by the municipality with experienced contractor input. These materials shall at a minimum contain site specific gradations of indigenous mineral fillers consisting of a 3/8" maximum particle size with a suitable particle charge, and may be combined with sand and/or stone dust as needed (see attached manufacturer's information). Additional components or cover material additives that may be desired are the sole responsibility of the municipality.

CRF® MODIFIED ASPHALT EMULSION

TEST ON MATERIAL	TEST METHOD	REQUIREMENTS	
PROPERTIES	**ASTM**	**MIN.**	**MAX.**
Viscosity @ 25°C, SFS	D-244	25	150
Sieve Test, %w	D-244 (Mod)[1]	--	0.1
Particle Charge Test	D-244	Positive	
Cement Mixing Test, %w	D-244	--	2.0
Pumping Stability	_____[2]	Pass	
5-day Settlement Test, %w	D-244	--	5.0
Residue, %w	D-244 (Mod)[3]	64	--
TEST ON RESIDUE FROM DISTILLATION			
Viscosity @ 60°C, cSt	D-2170	1,000	4,000
Maltene distribution ratio $\frac{PC + A_1}{S + A_2}$[4]	D-2006-70	0.7	1.1
PC/S ratio[4]	D-2006-70	0.5	--
Asphaltenes, %w	D-2006-70	--	11.0

[1] Test procedure identical with ASTM D-244 except that distilled water shall be used in place of two percent sodium oleate solution.

[2] Pumping stability is determined by charging 450 m. of emulsion into one-liter beaker and circulating the emulsion through a gear pump (Roper 29.B22621) having ¼ inch inlet and outlet. The emulsion passes if there is no significant oil separation after circulating ten minutes.

[3] ASTM D-244 Evaporation Test for percent of residue is modified by heating 50-gram sample to 149°C (300°F) until foaming ceases, then cooling immediately and calculating results.

[4] Chemical composition by ASTM D-2006-70: PC= Polar Compounds; A_1= First Acidaffins; A_2= Second Acidaffins; S= Saturated Hydrocarbons

ALTERNATE #2.2 – RECLAMITE® MALTENE REPLACEMENT EMULSION

MECHANICAL APPLICATION OF Reclamite® Maltene Replacement Emulsion
Scope: Reclamite® is a maltene based cationic petroleum emulsion formulated to maximize and maintain high road ratings and extend the service life of asphalt pavements. It will restore the maltenes, the components of asphalt lost in the aging process, and assists in adjusting the rheology of asphalt binder increasing penetration values and decreasing viscosity and corresponding Dynamic Shear Rheometer (DSR) values.

Application:

A. The municipality shall remove all old and/ or foreign matter and other debris from areas to be sprayed, providing a clean surface. No material shall be applied when the surface is damp or where frost, snow or ice is present nor where the ambient temperature is below 32° F.
B. A predetermined job mix formula consisting of a site specific formulation of the attached specified **Maltene Replacement Emulsion** shall be uniformly applied curb to curb on the pavement by mechanical means utilizing an appropriate distributor truck. Once the emulsion is broken, the cover material(s) shall be furnished and applied by the municipality at a rate of 3-5 lbs/sy to provide friction cover of treated areas. The pavement shall be immediately opened to traffic upon satisfactory distribution of the cover material(s) as directed. The actual formulation, rate of application and cover material to be utilized will be as directed by the individual municipality with experienced contractor field testing and input
C. Work locations and areas to be treated will be specifically delineated in the field by an authorized municipal representative.
D. The municipality shall supply traffic control and any necessary barricades, cones, warning signs, flagmen, etc. including all cover materials and application thereof including any necessary post application cleanup.

Equipment - A suitable asphalt distributor truck with a minimum capacity of 1,500 gallons, designed, equipped and normally used to apply the Maltene Replacement Emulsion uniformly at various widths, and at predetermined rates of application ranging from approximately 0.05 to 0.15 gallons per square yard as required. The contractor shall furnish and mechanically apply the job mix formula of **Maltene Replacement Emulsion** curb to curb, or as directed. The mechanical application crew shall consist of two truck drivers, the specified distributor truck and a utility truck for support.

Cover Material: The cover materials shall be selected and provided by the municipality with experienced contractor input. These materials shall at a minimum contain site specific gradations of indigenous mineral fillers consisting of a 3/8" maximum particle size with a suitable particle charge, and may be combined with sand and/or stone dust as needed (see attached manufacturer's information). Additional components or cover material additives that may be desired are the sole responsibility of the municipality.

RECLAMITE® MALTENE EMULSION

TEST ON MATERIAL PROPERTIES	TEST METHOD ASTM	REQUIREMENTS MIN.	MAX.
Viscosity @ 25°C, SFS	D244	15	40
Residue, %W[1]	D244 (Mod)	60	65
Miscibility [2]	D244 (Mod)	No coagulation	
Sieve analysis %W[3]	D244 (Mod)	--	0.1
Particle Charge	D244	Positive	
TEST ON RESIDUE FROM DISTILLATION			
Flash point, COC, °C	D92	196	--
Viscosity @ 60°C, cSt	D445	100	200
Asphaltenes, %W	D2006-70	--	0.75
Maltene distribution ratio $\frac{PC + A_1}{S + A_2}$[4]	D2006-70	0.3	0.6
PC/S ratio[4]	D2006-70	0.5	--
Saturated hydrocarbons	D2006-70	21	28

[1] ASTM D 244 Modified Evaporation Test for percent of residue is made by heating a 50- gram sample to 149°C (300°F) until foaming ceases, then cooling immediately and calculating results.

[2] Test procedure identical with ASTM D 244-60, except that 0.02 Normal Calcium Chloride solution shall be used in place of distilled water.

[3] Test procedure identical with ASTM D 244, except that distilled water shall be used in place of two percent sodium oleate solution.

[4] Chemical composition by ASTM D-2006-70: PC= Polar Compounds; A_1= First Acidaffins; A_2= Second Acidaffins; S= Saturated Hydrocarbons

BID EXCEPTIONS:

Felix A. Marino Co., Inc.'s (FAMCO's) bid submission does not include prices for the Hot Pour Methods, Fog Coat Sealer or Stone Mastic Asphalt. FAMCO's submission is only for Cold Applied Crack Sealing and Modified Asphalt and Maltene Rejuvenating Emulsion sealing methods as allowed under Bid Specification Section I, under the heading "INTENT", paragraph 2.

The municipality will procure, furnish and apply all cover materials, cover, store and load these materials onto their own truck(s) or FAMCO truck(s), as needed for the cold crackfilling / sealing processes. The municipality will load onto their own sanders for mechanical applications.

The municipality reserves the right to place the cover material themselves and/or hire outside forces for the cover material placement.

The municipality shall be responsible for:

- Allowing for an eight (8) hour work day
- Informing the general public prior to the performance of the process
- Providing traffic control, signage, police details, as necessary
- If necessary, all costs associated with clean up, including sweeping, hauling, disposal, etc.

The **Felix A. Marino Company** has been an approved applicator of **CCCF** for over 37 years.

BID PRICING

ALTERNATE 1:

Provide pressurized emulsion tank as specified with applicator and 320 gallons of emulsion for application by Municipal forces including placing the cover material.

ALT 1.1 **Total $5,760.00 per tank**

ALTERNATE 1.2:

Provide CCCF tank, truck and 2-man labor crew per 8-hour day to apply CCCF. Municipality to provide cover material and covering of poured CCCF.

ALT 1.2 **Total $7,950 per day**.

ALTERNATE 1.3:

Provide CCCF tank, trucks and 4-man labor crew per 8-hour day to apply CCCF. Municipality to provide cover material loaded onto FAMCO truck.

ALT 1.3 **Total $9,950 per day**.

ALTERNATE 2:

Curb to curb mechanical liquid application, as per specification (sander application with specified cover material shall be provided by the municipality, based on 0.08 GL/SY application rate)

ALT 2.1	**CRF® Modified Asphalt Emulsion (20,000 SY minimum)**	**$1.44/SY**
ALT 2.2	**Reclamite® Maltene Rejuvenating Emulsion (20,000 SY minimum)**	**$1.56/SY**

Bidder:

Felix A. Marino Co., Inc.
32 Corwin Street
Peabody, MA 01960
978-532-3838
978-532-3726 Fax
www.famco.us

Authorized Representative: Jim Henebury, Vice President

Signature of Authorized Representative: _____ Date: 9/22/22

E-mail Address: jhenebury@felixamarino.com

Date of Bid: *09-22-2022*

Time of Bid: 9:00 AM

(Corp. Seal)