

CITY OF KALAMAZOO

PROGRESS CLAUSE

HRC

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10/11/2023

a. The Contractor shall submit a complete, detailed and signed, Progress Schedule, to the Engineer, utilizing MDOT form number 1130.

b. The progress schedule shall include, at a minimum, the controlling work items for the completion of the project and the planned dates that the work items will be the controlling operations. All contract dates including open to traffic, project completion, interim completion and any other controlling dates in the contract must be included in the progress schedule.

c. After receiving Notice of Award, start work 10 calendar days after award or on a date approved by the Engineer. In no case may any work be commenced prior to receipt of formal notice of award by the City. The Engineer anticipates that construction can begin no earlier than **May 06, 2024**.

d. The project must be open to traffic, including final site restoration, permanent pavement markings and signs, punch-list, and/or project clean-up on or before **June 7, 2024**.

e. After award, and prior to the start of work, the Contractor must attend a preconstruction meeting with the Engineer. The Engineer will determine the day, time, and place for the preconstruction meeting. The meeting will be conducted after the project award and may be rescheduled if there are delays in the award of the project. The named subcontractor(s) for, Designated and/or Specialty Items, as shown in the proposal, is recommended to be at the preconstruction meeting if such items materially affect the work schedule.

f. Liquidated Damages shall be assessed in accordance with Section 108.10 for the 2020 Standard Specifications for Construction.

g. The Contractor may be required to meet for a post-construction review meeting, as directed by the Engineer. The Engineer will schedule the meeting.

h. Failure on the part of the Contractor to carry out the provisions of this Progress Clause may be considered sufficient cause to prevent bidding on future projects with the City.

CITY OF KALAMAZOO
COORDINATION CLAUSE

HRC

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10/11/2023

Other contracts or work activities may commence within the immediate area during the life of this contract.

The Contractor will conduct operations to cooperate with and interfere as little as possible with activities of other Contractors, Utilities, or other Public Agencies working within or adjacent to the construction limits of the project in accordance with the latest edition of the Michigan Department of Transportation's Standard Specifications for Construction.

The Contractor will take due account of all work, and will coordinate the work, along with storage of materials and equipment to cause minimum interference with the work being performed by others and City events.

No claims, extra compensation, or adjustment will be allowed on account of a delay or failure of others to complete work as scheduled.

After completing the milling and removal of existing pavement, and after the Engineer has determined the locations for full depth pavement repairs, the Contractor shall conduct a MISS DIG investigation (as outlined in the log or the plan set and these special provisions) and coordinate with any utility companies, within the project limits, to avoid disruption or damage to their facilities.

The Contractor shall notify and coordinate with the City of Kalamazoo's METRO bus system for temporary closure or relocation of bus stops and to avoid disruption of scheduled services.

CITY OF KALAMAZOO

NOTICE TO BIDDERS

UTILITY COORDINATION

HRC

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10/11/23

For protection of underground utilities and in conformance with Public Act 174 of 2013, the Contractor will dial 1-800-482-7171 a minimum of three (3) full working days, excluding Saturdays, Sundays, and holidays, prior to beginning each excavation in areas where public utilities have not been previously located. Members will thus be routinely notified. This does not relieve the Contractor of the responsibility of notifying utility owners who may not be a part of the “Miss Dig” alert system.

Public Utilities

The following Public Utilities have facilities located within the right-of-way:

Company	Contact	Phone
AT&T	Philip Bardocz	(269) 823-3339
Charter Communications	Gary Wilson	(269) 792-0638
City of Kalamazoo – Sanitary	Ryan Stoughton	(269) 337-8736
City of Kalamazoo – Traffic	Dennis Randolph	(269) 337-8612
City of Kalamazoo –Water	Anna Crandall	(269) 337-8055
Consumers Energy – Electric	Andre Taylor	(269) 337-2245
Consumers Energy – Gas	Kyle Oak	(248) 249-7175
Lumen	Dave Huckfeldt	(517) 812-2592

The owners of existing service facilities that are within grading or structure limits will move them to locations designated by the Engineer or will remove them entirely from the street right-of-way. Owners of Public Utilities will not be required by the City to move additional poles or structures in order to facilitate the operation of construction equipment unless it is determined by the Engineer that such poles or structures constitute a hazard to the public or are extraordinarily dangerous to the Contractor’s operations.

The contractor will cooperate and coordinate construction activities with the owners of utilities as stated in section 104 for the 2020 MDOT Standard Specifications for Construction. In addition, for the protection of underground utilities, the contractor will follow the requirements in section 107 of the 2020 MDOT Standard Specifications for Construction. Contractor delay claims, resulting from a utility, will be determined based upon section 108 of the 2020 MDOT Standard - Specifications for Construction.

CITY OF KALAMAZOO
SPECIAL PROVISION
FOR
RELATIONS AND RESPONSIBILITY TO THE PUBLIC

COK

1 of 1

09-18-23

- a. **Description.** The Contractor shall notify the Engineer when the first day of construction is planned no less than ten (10) business days prior to the start of the work. Following this correspondence, the City will issue a press release, media notice or other general form of notification to all the City's residents of the planned work. No work shall be performed prior to the issuance of this notice.

Additional notification shall be provided to the residents directly affected via door hanger notices no less than 72 hours before their street is planned to receive work. The Contractor will provide preprinted door hanger material to carry the Contractor's message. Message content must be approved by the Engineer prior to printing and distribution. The responsibility for filling out the door hangers and distributing them will be the Contractor's. Payment for this work will not be paid separately, but payment will be considered as having been included in the contract unit prices bid for other contract items. No work shall be performed prior to the distribution of these door hangers.

72 hours before every construction operation that will substantially affect a resident or business adjacent to the project site, (such as driveway closures, mailbox relocation, etc.) the Contractor will notify residents or businesses affected. The Contractor shall assist the City in coordination of work and mitigating impacts to the extent possible while maintaining construction schedules and ensuring project completion.

CITY OF KALAMAZOO
SPECIAL PROVISION
FOR
MAINTAINING TRAFFIC

HRC

1 of 4

10-26-23

a. Description. This work shall consist of maintaining construction zone traffic and placing traffic control devices for Riverview Drive Resurface and any affected side streets as described in this special provision and as directed by the Engineer in the City of Kalamazoo, Michigan.

1. Phase 1:
 - A. Shift traffic utilizing Southbound travel lanes. Mill Northbound Riverside Drive to expose concrete for joint and base repairs. Perform Detail 8 and Asphalt Mastic repairs. Pave Northbound Riverside Drive leveling course after Repairs completed. Coordinate with the Metro to maintain bus stops.
 - B. Maximum closure length shall be no greater than 10 business days.
2. Phase 2:
 - A. Shift traffic utilizing Northbound travel lanes. Mill Southbound Riverside Drive to expose concrete for joint and base repairs. Perform Detail 8 and Asphalt Mastic repairs. Pave Southbound Riverside Drive leveling course after repairs completed. Coordinate with the Metro to maintain bus stops.
 - B. Maximum closure length shall be no greater than 10 business days.
 - C. After leveling, adjust drainage structures within Phase 2 limits.
3. Phase 3:
 - A. After Phase 2 has been completed, the Contractor shall proceed with Phase 3, no more than one (1) business day afterwards.
 - B. Adjust drainage structures within Phase 1 limits.
 - C. Pave Southbound and Northbound Riverside Drive Top Course at night. Install permanent pavement markings for Southbound and Northbound Riverside Drive at night. Two-way traffic shall be maintained at all times. Coordinate with the Metro to maintain bus stops.

b. Materials. Provide material in accordance with Sections 812 and 922 of the Michigan Department of Transportation (MDOT) Standard Specifications for Construction.

c. Storage of Materials. Location for storage of materials shall be addressed by the contractor in the City ROW permit and approved by the Engineer prior to the commencement of work. All maintenance of traffic materials shall be stored in the approved location(s). Any items not stored in the proper location shall be corrected no later than 24 hours after notice is given by the Engineer. Items found not stored in the approved locations or not corrected within the allotted time shall be grounds for the City to withhold payment for maintenance of traffic until corrected.

d. Construction. Traffic shall be maintained according to Chapter 6 of the Michigan Manual on Uniform Traffic Control Devices (MMUTCD) Guide to Sections 104.07, 104.11, 812, and 922 of the MDOT Standard Specifications for Construction, including any Supplemental Specifications, and as specified here.

1. The Contractor shall place Portable Changeable Message Signs (PCMS) two (2) weeks prior to the start of construction.
2. The Contractor shall notify the Project Engineer a minimum of 72 hours prior to the implementation of any detours, road closures, shoulder closures, or lane closures.
3. The Contractor shall coordinate his operations with Contractors performing work on other projects within or adjacent to the Construction Influence Area (CIA).
4. City of Kalamazoo (City), maintenance crews and/or Contract Maintenance Agencies may perform maintenance work within or adjacent to the CIA. The City and/or Contract Maintenance Agency will coordinate their operations with the Engineer to minimize the interference to the Contractor. No additional payment will be made to the Contractor for the joint use of the traffic control items.
5. The Contractor shall provide a traffic control plan for each phase of the project to the Engineer for approval by the Traffic Safety Department and the Engineer prior to beginning work requiring traffic control. The traffic control plan shall include all temporary signage, type II barricades, type III barricades, plastic drums, etc. and appropriate temporary pavement markings where needed.
6. Construction Influence Area (CIA). The CIA shall include the right-of-way of the following roadways, within the approximate limits described below:
 - A. 500 feet north/south and east/west of Riverview Drive from Gull Road to E. Michigan Avenue.
7. Traffic Restrictions and Construction Requirements.
 - A. All work for stage 1 and 2 shall be conducted during daytime hours unless otherwise specified herein or approved by the Engineer. Night work is permitted at the discretion of the Engineer. However, any additional cost for such work shall be borne by the Contractor.
 - B. All work for stage 3 shall be conducted during nighttime hours unless otherwise specified herein or approved by the Engineer. Day work may be permitted at the discretion of the Engineer. However, any additional cost for such work shall be borne by the Contractor.
 - C. Access for construction vehicles between the travel lanes and work areas will be restricted to specific locations. The number of access points and their locations will require the prior approval of the Engineer.
 - D. Undercuts or excavations immediately adjacent to active traffic lanes shall be restored to no less than a 1 on 4 slope at the end of each working period unless otherwise approved by the Engineer. Fencing shall be required to protect open trenches during non- working hours and shall be provided by the Contractor as

part of the trenching item utilized.

- E. Duration of driveway and alley closures shall be minimized. Contractor shall provide property owners with written notice a minimum of three (3) business days prior to the anticipated driveway and alley closure, and shall inform residents of the anticipated duration of the driveway or alley closure.
 - F. The Contractor shall maintain and coordinate daily waste pickup and deliveries to all business buildings affected by driveway, alley and road closures for this project.
 - G. Sidewalks or pathways in the project area shall be maintained at all times except in areas where sidewalk or pathway removal and replacement are ongoing. Sidewalk or pathways removed shall be replaced as soon as is feasibly possible.
 - H. Ingress and egress to all buildings and parking areas for pedestrians and vehicles shall be maintained.
 - I. Keep all side streets and alleys free of construction related materials, equipment, and activities to allow clear visibility and access to all properties and businesses.
 - J. Contractors, employees, and subcontractors shall not park vehicles or store equipment in areas that are needed for residential or adjacent commercial parking and at no time shall vehicles be parked or equipment stored on private property unless written permission is obtained from the property owner. Also, Contractors, employees and subcontractors shall not drive construction equipment of any kind on private property without written permission of the property owner.
 - K. Construction equipment and material storage shall not be allowed on top of existing areaways, pathways or sidewalks.
 - L. Street name signs shall be maintained within the construction area for the duration of the project. Street name signs shall be visible from all intersection corners. If the existing street name sign and support are to be removed, and there is no alternate support available, the Contractor shall erect a separate post & street name sign for this purpose. The cost for this work shall not be paid for separately but considered incidental to the pay items included for maintaining traffic.
 - M. Removing, obstructing, relocating or otherwise tampering with a regulatory traffic sign is prohibited unless approved by the Engineer and the City Traffic Safety Department. Where a conflict is foreseen or encountered, the sign(s) may be removed by the Contractor only upon installation of temporary signs(s) placed in accordance with the Michigan Manual of Uniform Traffic Control Devices (MMUTCD) at location(s) approved by the Engineer. Temporary signs shall be maintained by the Contractor until the existing permanent signs are reinstalled. The cost for this work shall be incidental to the pay items included for maintaining traffic.
8. Traffic Control Devices.
- A. General
 - i. All traffic control devices and their usage shall conform to the most current

revision of Part 6 of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD).

- ii. During non-working periods, any work site with uncompleted work shall have advance signs (W21-4 - "Road Work Ahead") and plastic drums, at specific locations, as directed by the Engineer.

B. Temporary Signs

- i. Tables for "L", "D" and "B" values are provided in MDOT Traffic and Safety Typical 101-GEN-SPACING-CHARTS.
- ii. Temporary signs shall be on ground driven sign supports as shown in MDOT Traffic and Safety Figure WZD-100-A.
- iii. The signing for a one or two lane closure and traffic shift shall be as shown in the MDOT Traffic and Safety Typical 123-NFW-1LC-(R) and 122-NFW-SHL-(R).
- iv. All diamond-shaped warning signs shall be 48 inch x 48 inch mounted at a 7 foot minimum bottom height in curbed or pedestrian areas.
- v. Distances between construction warning, regulatory and guide signs shown on the Figures are approximate and may require field adjustment, as directed by the Engineer.
- vi. All temporary signs shall be constructed with legends and symbols flush to the sign face and not extending beyond the sign borders or edges.
- vii. All temporary signs shall be faced with prismatic retroreflective sheeting.
- viii. If necessary, the City will provide temporary neighborhood business signage (sign board only) for the purpose of directing the public to the various businesses within the Construction area. The Contractor shall be responsible for the installation, maintenance, and relocation of these signs as necessary to coincide with the various phases of the project. If included in the contract, the cost to install, maintain, and relocate these signs will be paid for under the item "Install and Maintain Temporary Neighborhood Business Signs".
- ix. Whenever a lane or obstruction is removed, all related construction signs shall be removed, turned away from traffic or otherwise made not visible to traffic.

C. Channelizing Devices

- i. Channeling devices required for maintaining one lane of traffic in each direction shall be Channelizing Device, 42 inch.

e. Measurement and Payment. The completed work shall be paid for at the contract unit price which shall include all materials, equipment and labor required to complete this work. Pay items are listed in the contract and invitation for bid documents.

CITY OF KALAMAZOO
SPECIAL PROVISION
FOR
COLD MILLING HMA AND CONCRETE PAVEMENT, MODIFIED

HRC

1 of 1

09-14-23

a. Description. This work consists of accurately removing the top portion of an existing pavement section, whether hot mix asphalt, concrete, or a combination, to the depth and cross section shown on the log or plans, and as directed by the Engineer.

b. Equipment. Use cold milling machine(s) equipped with positive depth control adjustments and a positive means for controlling the cross slope. Equip the milling machine with an integral pickup and conveying device to immediately remove material being milled from the surface of the roadway and discharge the millings into a truck in one operation. Provide a machine with a means of effectively limiting the amount of dust escaping from the milling and removal process.

c. Construction. Cold mill the existing hot mix asphalt (HMA) and / or concrete pavement to the depth and cross section indicated on the log or plans, and as directed by the Engineer. When HMA pavement depth is greater than the indicated depth and cross section, remove additional HMA pavement until the underlying concrete is exposed. Collect and dispose of the excess material resulting from the operations as specified in subsections 104.07.D and 204.03.B of the MDOT Standard Specifications for Construction.

Provide a final surface texture that is reasonably smooth and free of gouges, holes, or large depressions. Prevent damage to the adjacent and below concrete. Where material is removed below the depth specified, due to poor cold-milling practice, backfill and compact the resulting holes or depressions by hand patching in accordance with subsection 501.03.C.9 of the MDOT Standard Specifications for Construction. Repair all damage to adjacent surfaces as directed by the Engineer. All costs associated with this corrective work will be borne by the Contractor.

Provide protection around existing manholes, catch basin inlets, utility valve boxes, and any similar structures. Ensure any damage to such structures because of the milling operation is repaired at no additional cost to the contract. Prevent the milled material from falling into inlet openings. Remove any milled material that does fall into inlet openings.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Cold Milling HMA and Conc Pavt, Modified	Square Yard

Cold Milling HMA and Conc Pavt, Modified includes removing HMA and concrete pavement as described herein, loading removed debris, hauling debris, and disposal of the debris. Material picked up by sweeping after cold milling will not be paid for separately. This work will be measured by area in square yards, regardless of the number of passes required to remove the HMA and / or concrete to the required depth or exposure.

CITY OF KALAMAZOO
SPECIAL PROVISION
FOR
SURFACE RESTORATION

COK

1 of 2

09-18-23

a. Description. This work shall be done in accordance with the City of Kalamazoo standards. The requirements of the special provision include a one-year warranty period from the date of final inspection performed by the City of Kalamazoo or its designated representative.

b. Materials. The materials and application rates specified in Sections 816 and 917 of the 2020 Michigan Department of Transportation (MDOT) Standard Specifications for Construction apply unless modified by this special provision or otherwise directed by the Engineer.

Materials included in Surface Restoration:

1. Topsoil Surface, Furn, 3 inch
2. Fertilizer, Chemical Nutrient, CI A (12-12-12)
3. Seeding, Mixture THM
4. Paper mulch shall be used for hydroseeding
5. Mulch Blanket
6. Water, Sodding/Seeding/Hydroseeding
7. Tackifier shall be MDOT approved from the QPL
8. The hydro-seeding slurry shall consist of a mixture of the following materials:
 - Mulch: 2,000lbs./acre
 - Fertilizer: 400lbs./acre
 - Tackifier: 25lbs./acre
 - Seed: 220lbs./acre
 - Water: As required

c. Construction Methods. Prior to placing topsoil, shape and compact all areas to be seeded and hydroseeded. Place topsoil to the minimum depth indicated above, to meet proposed finished grade. If the area being restored requires more than the minimum depth of topsoil to meet finished grade, this additional depth may be filled with approved excavated material. Furnishing and placing this additional material is considered incidental in patching sections.

In areas of hydroseeding, the Contractor shall protect site features from overspray. These features shall include, but not be limited to, fire hydrants, mailboxes (including posts), private properties, sidewalks, driveways, pavements, or other surfaces that the Engineer may designate as needing to be protected from the hydroseeding operation. Where directed by the Engineer, the Contractor will be responsible to remove all unwanted or unintended overspray. The cost of this work will be the sole responsibility of the Contractor.

Areas within existing drainage channels shall be restored using mulch blankets with appropriate anchors as recommended by the manufacturer. All other areas shall be restored using mulch. Mulch shall be bladed into the prepared earth to provide proper anchoring.

If a restored area washes out after this work has been properly completed and approved by the Engineer, make the required corrections to prevent future washouts and replace the topsoil, fertilizer, seed, and mulch. This replacement shall be paid for as additional work. If an area washes out for reasons attributable to the Contractor's activity or failure to take proper precautions, replacement shall be at the Contractor's expense.

All areas disturbed by the Contractor and/or their Subcontractors beyond the normal construction limits of this project shall be restored as directed by the Engineer. No additional payment or compensation will be allowed for this activity.

By October 15, only those areas for which work for Surface Restoration has already begun shall be completed. After October 15, any remaining areas shall be graded and covered by mulch blanket, temporary seeding and restored the following April 15, or as soon as weather permits.

The Contractor shall establish a dense lawn of permanent grasses, free from lumps and depressions or any bare spots, none of which is larger than one foot of area up to a maximum of 3% of the total seeded lawn area. Any part of the seeded lawn that fails to show a uniform germination shall be reseeded until a dense grass cover is established.

Repair, rework, re-seed all areas that have washed out, are eroded, or do not catch.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Surface Restoration, Modified.....	Square Yard

Surface Restoration, Modified will be measured in place. Payment for restoration shall include all materials, equipment, and labor required to complete the work as described.

CITY OF KALAMAZOO
SPECIAL PROVISION
FOR
DR STRUCTURE COVER, TYPE __, MODIFIED

COK

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09/19/2023

- a. **Description.** This work consists of furnishing City of Kalamazoo sanitary and storm sewer structure covers during construction operations in accordance with Section 403 of the MDOT Standard Specifications for Construction.

- b. **Materials.** Provide materials in accordance with the following:
 - i. **Cover and Casting:** Supply a Dr Structure Cover, Type __ and Modified in accordance with City of Kalamazoo Specifications for Sanitary and Storm sewer meeting the requirements of Section 908 of the MDOT Standard Specifications for Construction.

 - ii. **Cover Q (Storm Sewer)** – shall consist of an EJIW 1045ZPT (bolted) frame with a 1040A (non-bolted) **Non-Vented** Cover with 2 inch “STORM SEWER” lettering or approved equal.

 - iii. **Cover S (Sanitary Sewer)** – shall consist of an EJIW 1045ZPT (bolted) frame with a 1040A (non-bolted) Cover with 2 inch “SANITARY SEWER” lettering or approved equal.

 - iv. **Mortar Type R-2:** Use mortar meeting the requirement of Section 1005.

- c. **Construction Methods.** Refer to the latest edition of the “MDOT Standard Specification for Construction” for construction methods.

- d. **Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Dr Structure Cover, Type __, Modified.....	Each

The unit price for **Dr Structure Cover, Type __, Modified** includes supplying the new cover and adjustment rings to be placed and adjusted per the latest edition of the MDOT Standard Specification for Construction.

CITY OF KALAMAZOO
 SPECIAL PROVISION
 FOR
GATE BOX, RECONSTRUCT, MODIFIED

HRC/LNM

1 of 1

01/12/2022

a. Description. This work consists of furnishing and placing a gate box centered, plumbed, and adjusted to the required pavement grade over the existing gate valve.

b. Materials. Provide materials in accordance with the following:

1. **Gate Box:** Shall be an adjustable length screw type for 5-foot depth of cover. The gate box shall be a malleable iron casting conforming to Subsection 908.03 of the Michigan Department of Transportation (MDOT) *Standard Specification for Construction*. This valve box shall be either a two or three-piece screw type and the cover shall be inscribed with the word "water". Valve box shall be EJ 8550 Series (two piece) or EJ 8560 Series (three piece), or Bingham & Taylor, capable of being mounted directly to the gate valve box.

2. **Masonry Unit:** Use Masonry units meeting the requirements of Section 913.

3. **Granular Material Class II:** Use Granular Material Class II meeting the requirements of Section 902.

c. Construction Methods. Remove pavement around the existing gate box and remove gate box in accordance with Section 204. Salvage existing gate box and place in a secure location for pick up and notify the Engineer when all gate boxes are ready for pick up. Place four (4) evenly spaced masonry units around gate valve ensuring the gate box rests on the masonry units and not the gate valve. Install gate box level and plumb. Backfill in accordance with Subsection 204.03 ensuring the gate box does not shift during backfilling. Adjust cover to final grade, flush with the top of the pavement surface.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Gate Box, Reconstruct, Modified.....	Each

The unit price for **Gate Box, Reconstruct, Modified** includes all labor, equipment, and materials to remove the existing pavement, supply and install the gate box, backfill, and compact for a fully furnished and functional gate box. Reconstruction of the gate box shall be done per this special provision and the latest edition of the MDOT Standard Specification for Construction.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
ASPHALT REPAIR MASTIC

CFS:TGH

1 of 2

APPR:CRB:NDM:08-02-23

a. Description. This work consists of cleaning, filling, and leveling the longitudinal construction joints, transverse joints, longitudinal and transverse cracks, and spalls with asphalt repair mastic material.

Clean and fill joints, cracks and spalls at the locations shown in the contract, or as directed by the Engineer.

b. Materials. Furnish applied, pre-packaged, pourable, aggregate filled, polymer modified asphalt repair mastic for both concrete and HMA pavement repairs. Use Deery Level, Go Repair Mastic; Crafcoc Mastic One; RightPointe Pave Patch Black; Fibrecrete SAMIscreed; Maxwell Gap Mastic Mod 201; P&T Products Dura-Fill Mastic T2; Pure Asphalt Mastic SR; or an approved equal, as determined by the Engineer.

For concrete pavement, use one of the following 100 percent solids silane primer products: Baracade Silane 100C, Hydrozo® 100, Sikagard® 705L, or an approved equal 100 percent solids silane material, as determined by the Engineer. Do not use silane primer material for HMA pavement repairs.

c. Equipment. Heat the asphalt repair mastic material in a thermostatically controlled hot oil jacketed mastic mixer equipped with a full sweep horizontal agitator that can maintain a uniformly mixed product. The mixer must have an effective means of dispensing the thoroughly mixed mastic material.

d. Surface Preparation and Installation. Prepare all surfaces by ensuring they are free from dust, dirt, oil, grease, and loose material prior to application of the mastic using clean, dry, oil free compressed air at 90 psi minimum. Sound substrate surfaces and remove delaminated material prior to final cleaning. Ensure the surfaces of the pavement are completely dry and clean at the time of mastic application.

Artificial heat may be used to warm the substrate surface provided it does not apply a direct flame to the substrate surface, as recommended by the mastic manufacturer. Do not overheat pavement surfaces.

1. HMA. Apply asphalt repair mastic when pavement temperature is above 40 °F. Place and finish asphalt repair mastic within 10 minutes after warming the pavement area.

2. Concrete. Apply asphalt repair mastic when pavement temperature is above 40 °F. Prior to placing the asphalt repair mastic material, apply silane primer onto the repair area and a minimum of 6 inches onto the adjacent pavement surface at a rate of no less than one gallon per 200 square feet. Allow a minimum of 1 hour for the primer to cure (more time may be necessary depending on weather conditions) prior to placing asphalt repair mastic.

Ensure the Contractor is trained and approved by the mastic manufacturer.

Heat and uniformly mix the asphalt repair mastic to the appropriate installation temperature using a mastic mixer. The product application temperature range is 350-400 °F, verify with specific manufacturer's requirements. At application temperature, material is a thick, grainy appearing mastic.

Place the mastic onto the properly prepared pavement surface in accordance with the mastic manufacturer recommendations.

Apply the mastic to the joint, crack or spall from the bottom up in lifts appropriate to the specific application. Mastic should be applied to open joints, cracks and spalls that are wider than 1¼ inches width. If multiple lifts are required, product should be installed in layers not to exceed 2½ inches, with cooling to 200 °F maximum before applying the next layer. Fill the uppermost 1/2 to 1 inch with the final lift.

Use a heated ironing wand and or shoe box to level and smooth the mastic until the material has formed a durable, well-bonded, level repair as directed by the Engineer.

Place temporary pavement markings if permanent markings are more than fifty percent covered before opening the road to traffic.

e. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Asphalt Repr Mastic	Foot

Asphalt Repr Mastic will be measured in feet based on in-place quantities. Payment includes all surface preparation, temporary pavement markings, furnishing, hauling, placing, and finishing of all materials, removal, and disposal of all debris.