CITY OF BERRY HILL, TENNESSEE
BID DOCUMENTS
FOR
PAVEMENT MARKING SERVICES

October 18, 2019

CITY OF BERRY HILL
698 THOMPSON LN
NASHVILLE, TN 37204

LEGAL NOTICE

Sealed bids for pavement marking services will be received by the City of Berry Hill, Tennessee, 698 Thompson Lane, Nashville, TN 37204, on or before Thursday, November 7, 2019 at 10:00 am, local time, at which time and place the bids shall be publicly opened and read aloud.

Specifications and bid documents may be obtained from Joe C. Baker, Berry Hill City Manager, 615-292-5531, jbaker@berryhilltn.net, or downloaded from http://berryhilltn.org/bids.aspx.

Bidders must be licensed in accordance with state law. The City of Berry Hill reserves the right to reject any and all bids, to waive irregularities and/or informalities in any bid, and to make an award in any manner, consistent with law, deemed in the best interest of the City.

Bids must be made on the Bid Forms and in accordance with Instructions to Bidders furnished by the City of Berry Hill. The envelope containing the proposal must be sealed and plainly marked: *Sealed Bid Enclosed – Pavement Marking Services – to be opened November 7, 2019.* If the bid is $25,000 or more, the bid envelope is required to have the contractor's name, license number, expiration date and classification on it.

Any questions should be directed to Joe Baker, City Manager, 615-292-5531

INVITATION TO BID

City of Berry Hill
698 Thompson Lane
Nashville, TN 37204

PAVEMENT MARKING SERVICES BID
CITY OF BERRY HILL, TENNESSEE

You are invited to bid on a contract to provide pavement marking services to the City of Berry Hill.

Bids will be received by the City of Berry Hill, c/o Joe C. Baker, City Manager, at Berry Hill City Hall, 698 Thompson Ln., Nashville, TN 37204, until 10:00 am, local time, Thursday, November 7, 2019, at which time and place, bids will be publicly opened and read aloud.

Bids must be made on the Bid Forms and in accordance with Instructions to Bidders furnished by the City of Berry Hill. The envelope containing the proposal must be sealed and plainly marked: *Sealed Bid Enclosed – Pavement Marking Services – to be opened November 7, 2019.* If the bid is $25,000 or more, the bid envelope is required to have the contractor's name, license number, expiration date and classification on it.

This project generally consists of pavement marking on selected streets within the City of Berry Hill.

Bid documents may be obtained at Berry Hill City Hall, on or after October 18, 2019.

Any questions should be directed to Joe C. Baker, City Manager, at 615-292-5531.

Bidders must be licensed in accordance with state law. The City of Berry Hill reserves the right to reject any and all bids, to waive irregularities and/or informalities in any bid, and to make an award in any manner, consistent with law, deemed in the best interest of the City.

INSTRUCTIONS TO BIDDERS
PAVEMENT MARKING SERVICES

BIDDER'S REPRESENTATIONS

The Bidder by making a Bid represents that:

The Bidder has carefully read and understands the Bidding Documents and has found them complete and free from ambiguities and sufficient for the purpose intended;

The Bid is made in accordance with the Bidding Documents;

Neither the Bidder nor any of the Bidder's employees, agents, intended suppliers or subcontractors have relied upon any verbal representations, allegedly authorized or unauthorized from the Owner, or the Owner's employees or agents, including architects, engineers or consultants, in assembling the bid figure; and

The bid figure is based solely upon the Bidding Documents and properly issued written agenda, and not upon any other written representation.

FORM AND STYLE OF BIDS

Fill in all blank spaces on Bid Form; failure to do so will be cause for rejection. No segregated Bids or assignments will be considered. No qualifying letters or statements will be considered.

Where so indicated by Makeup of Bid Form, sums shall be expressed in both words and figures, and in case of discrepancy between the two, the amount written in words shall govern.

Make Bids on unaltered Bid Forms furnished by the City. Submit one copy of Bid Form. Bids shall be signed by a person or persons legally authorized to bind Bidder to contract, with name typed or legibly printed below the signature.

SUBMISSION OF BID

Submit Bid in a sealed opaque envelope. Identify envelope with name and address of Bidder and clearly mark envelope as "Sealed Bid Enclosed – Pavement Marking Services – to be opened November 7, 2019" on the face thereof. The bid envelope is required to have the contractor's name, license number, expiration date and classification on it.

Submit Bids in accordance with Invitation to Bid. It is the Bidder's responsibility to insure receipt of the Bid by the Owner, before the time set and at the place identified for receipt of Bids. Bids received after the scheduled opening time will be returned to the Bidder unopened.

MODIFICATION OR WITHDRAWAL OF BID

Withdrawal of a submitted Bid before scheduled opening time requires a written request signed by a person legally authorized to bind Bidder to the Contract. Withdrawn Bids may not be resubmitted.

Bid modifications shall be written as add or deduct only and require signature of a person legally authorized to bind the Bidder to the Contract.

Bids shall not be withdrawn or modified after the scheduled Bid opening time.

Bids shall not be withdrawn or cancelled for time period stated in Bid Form subsequent to Bid opening without Owner's written permission.

OPENING OF BIDS

Bids will be opened as announced in Invitation to Bid.

REJECTION OF BIDS

Owner reserves the right to accept or reject any or all Bids, reject a Bid not accompanied by data required by the Bidding Documents, or reject a Bid that is in any way incomplete or irregular.

Although not intended to be an exhaustive list of causes for disqualification, any one or more of the following causes, among others, may also be considered sufficient for the disqualification of a Bidder and the rejection if its Bid:

(a) Evidence of collusion among Bidders.

(b) Lack of competency or responsibility as shown by past work, judged from the standpoint of workmanship as submitted.

(c) Default on a previous contract for failure to perform.

ACCEPTANCE OF BID (AWARD)

The Owner intends to award the work to the lowest responsible Bidder, provided the Bid has been submitted in accordance with requirements of the Bidding Documents and does not exceed funds available. Owner shall have the right to waive informalities or irregularities in a Bid received, and to negotiate contract terms with various Bidders in accordance with applicable laws in Owner's best interests.

The Owner shall have the right to accept alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

DRUG-FREE WORKPLACE

Under the provisions of Tennessee Code Annotated §50-9-113 enacted by the General Assembly effective 2001, a) employers with five (5) or more employees who contract with either the state or a local government to provide construction services are required to submit an affidavit stating that they have a drug free workplace program that complies with Title 50, Chapter 9, in effect at the time of submission of a bid at least to the extent required of governmental entities. The statute imposes other requirements on the contractor, but the grantee's responsibility is specifically limited in section (b) of the statute as follows:

(b) A written affidavit by the principal officer of a covered employer provided to a local government at the time such bid or contract is submitted stating that the employer is in compliance with this section shall absolve the local government of all further responsibility under this section and any liability arising from the employer's compliance or failure of compliance with the provisions of this section.

BID FOR UNIT PRICE CONTRACT
PAVEMENT MARKING SERVICES

Submitted: _____, 2019

Proposal of _____ (hereinafter called "Bidder") a
(a corporation) (a partnership) (an individual doing business as _____)

STRIKE OUT INAPPLICABLE TERMS

To the City of Berry Hill (hereinafter called "OWNER")

The Bidder, in compliance with your invitation for bids for pavement marking services, hereby declares that this Bid is made without any expressed or implied connection (financial or otherwise) with any other person or company or parties making a bid on the above named project; and that this Bid is, in all respects, fair and in good faith without collusion or fraud.

The Bidder hereby agrees:

1. To hold open this Bid for 60 days from the date shown above.
2. To enter into and execute a Contract, if awarded, on the basis of this Bid.
3. To accomplish Work in accordance with the Contract Document.
4. To provide, in full and complete accord with the requirements of the Specifications and Contract Documents, and to supply all labor, materials, transportation and appliances to complete the work to the full satisfaction of the Owner for the amounts listed below.
5. To begin work within thirty days after the written notification of the acceptance of this proposal. Bidder also agrees to time work procedure in accordance with the instructions given in these specifications.

Bidder acknowledges receipt of the following addendum:

_____

_____

_____

Bidder agrees to perform all the work described in the specifications and shown on the plans, for the following unit prices:

ITEM NO.	ITEM DESCRIPTION	UNIT	UNIT PRICE
716-02.01	Plastic Pavement Marking (4” Line)	L.M.	
716-02.05	Plastic Pavement Marking (Stop Line)	L.F.	
716-02.06	Plastic Pavement Marking (Turn Lane Arrow)	Each	
716-02.09	Plastic Pavement Marking (Longitudinal Crosswalk)	L.F.	
716-05.01	Painted Pavement Marking (4” Line)	L.M.	
716-05.05	Painted Pavement Marking (Stop Line)	L.F.	
716-05.06	Painted Pavement Marking (Turn Lane Arrow)	Each	
716-07.05	Removal of Existing Lines	L.F.	

The above unit prices shall include all labor, materials, removal, overhead, profit, insurance, etc., to cover the finished work of the kinds called for.

Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

The bidder agrees that this bid shall be good and may not be withdrawn for a period of 60 calendar days after the scheduled closing time for receiving bids.

Upon receipt of written notice of the acceptance of this bid, bidder will execute the formal contract attached within 10 days.

Respectfully submitted:

By: _____
(Signature)

_____
(Title)

_____

_____
(Address)

_____
(Telephone)

CONTRACT TO PROVIDE PAVEMENT MARKING SERVICES

This contract is entered into by and between the City of Berry Hill, 698 Thompson Lane, Nashville, Tennessee 37204 and _____, _____, under the following terms and conditions:

WHEREAS, a bid proposal to provide pavement marking services to the City of Berry Hill, Tennessee was submitted by _____, hereafter "Contractor" on _____, 2019, and;

WHEREAS, the City of Berry Hill, hereafter "Owner," has accepted the bid proposal, which is attached to this contract and made a part hereof as fully as if it were copied verbatim herein, and;

NOW THEREFORE, Owner and Contractor contract and agree as follows:

1. Contractor will provide pavement marking services in accordance with the requirements set forth in the attached Bid Documents, including Legal Notice, Invitation to Bid, Instructions to Bidders, and Specifications. The streets (or sections thereof) to be re-striped are marked on the attached map.

2. Owner will compensate Contractor, for work actually performed pursuant to the contract at the rates set forth in the bid proposal upon acceptance of the work and invoice for the work.

3. This contract may not be amended except by written agreement or change order of the parties signed by the same parties. All notices required under this Contract shall be given at the addresses listed above and in the case of the City of Berry Hill, to the City Manager.

4. This contract is governed by the laws of the State of Tennessee, and venue shall be in Davidson County, Tennessee.

Witness our hands and seals to this agreement this ____ day of_____, 20___, in Nashville, Davidson County, Tennessee.

CITY OF BERRY HILL, TENNESSEE

By: _____

CONTRACTOR

By: _____

Title: _____

CITY OF BERRY HILL SPECIFICATIONS
FOR PAVEMENT MARKING SERVICES

A. Definitions and General Information

1. The City of Berry Hill desires to contract a professional pavement marking service to mark a number of streets in the city.

2. The contractor selected shall meet all minimum requirements of this proposal.

3. All materials, equipment and techniques provided shall conform with the standards and requirements of the Tennessee Department of transportation Bureau of Highways Standard Specifications for Road and Bridge Construction, January 1, 2015, and the Federal Highway Administration Manual on Uniform Traffic Control Devices. Each of these documents are specified to be an effectual part of this contract document as if published herein.

B. Contractor's Obligations

1. The Contractor must be able to meet all requirements of this project.

2. The Contractor will provide fuel and maintenance of all vehicles and equipment.

3. The contractor must have a supervisor or foreman available at all times to direct operations. This supervisor or foreman will report to the City Manager, or his designee, any problems that occur, and provide progress reports when requested.

4. The contractor shall provide drivers with a CDL driver's license, class "D" within an F endorsement minimum.

5. The contractor agrees not to sublet or assign this contract in whole or in part without the written authorization of the City Manager.

APPENDIX A

Tennessee Department of Transportation Bureau of Highways
Standard Specifications for Road and Bridge Construction
January 1, 2015
Section 716 – Pavement Markings

SECTION 716 – PAVEMENT MARKINGS

DESCRIPTION

716.01 Description

This work consists of furnishing and supplying pavement markings in accordance with these Specifications and the latest revision of the MUTCD, including establishing and locating non-passing zones as well as providing the layout of paint striping, preformed plastic pavement markings, raised reflective pavement markers, snowplowable reflective pavement markers, and thermoplastic pavement markings.

MATERIALS

716.02 Materials

Provide materials as specified in:

Paint **910**
Thermoplastic Pavement Markings **919.01**
Spray Thermoplastic Pavement Marking **919.02**
Preformed Plastic Pavement Marking **919.03**
Raised Reflective Pavement Markers **919.04**
Snowplowable Reflective Pavement Markers **919.05**

Plastic pavement markings may be either preformed or thermoplastic unless otherwise specified.

CONSTRUCTION REQUIREMENTS

716.03 Thermoplastic Pavement Marking

Furnish and apply thermoplastic pavement marking material meeting **919.01** by the screed extrusion or ribbon dispenser methods, or spray thermoplastic pavement marking material meeting **919.02**.

As an alternate, the Contractor may apply preformed thermoplastic marking material for stop bars, cross walks, legends, or directional arrows. The preformed thermoplastic material shall have a minimum thickness of 0.090 inches and be fused to the pavement by the heat of a torch.

A. Equipment

Provide special kettle(s) for melting and heating the thermoplastic material. Equip the kettle(s) with automatic thermostatic control devices so that heating can be done by controlled heat transfer rather than by direct flame, to provide positive temperature control and prevent over-heating of the material.

Provide equipment that will continuously mix and agitate the material. Conveying parts of the equipment shall prevent accumulation and clogging. All parts of the equipment that come in contact with the material shall be easily accessible for cleaning and maintenance. All mixing and conveying parts of the equipment, including the shaping die (or spray nozzle in the case of spray thermoplastic marking material), shall maintain the material at the plastic temperature with heat transfer oil or electrical element controlled heat. Direct fire heat transfer will not be allowed.

The equipment shall ensure continuous uniformity in the dimensions of the stripe. The applicator equipment shall be mobile and maneuverable to the extent the straight line can be followed and normal curves can be made in a true arc. The applicator equipment shall provide a method of applying “skip” lines. Calibrate the equipment, and check it periodically by marking over a metal plate. The equipment shall provide for varying widths to produce varying widths of traffic markings.

1. **Extruded or Ribbon-Dispensed Thermoplastic Marking.** Apply the material to the pavement by either the screed extrusion method or the ribbon dispenser method.

   The screed extrusion device shall have one side of the shaping die open with the other three sides contained by, or part of, suitable equipment for heating and controlling the flow of material. Do not use pans, aprons, or similar appliances that the die overruns.

   Ribbon dispensers shall be heated, suspended above the road surface, and shall apply the material to the width and thickness specified.

   Apply glass spheres to the surface of the completed stripe by an automatic bead dispenser attached to the striping machine in such a manner that the beads are dispensed almost instantaneously upon the installed line. The glass sphere dispenser shall be capable of applying glass spheres to the surface of the completed stripe by a double drop application for initial traffic striping and marking. Attach the bead dispenser for the first bead drop to the striping machine so that the beads are dispensed closely behind with the thermoplastic material. Attach the second bead dispenser to the striping machine so that the beads are dispensed immediately after the first bead drop application. Equip glass sphere dispensers with an automatic cut-off control that is synchronized with the cut-off of the thermoplastic material and applies the glass spheres so that the spheres appear uniform on the entire traffic stripes and markings surface with 50 to 60% embedment.

   The applicator equipment to be used on roadway installations may consist of either hand equipment or truck mounted units depending on the type of marking required.

   The hand equipment shall have sufficient capacity to hold 150 pounds of molten material and shall be sufficiently maneuverable to install crosswalks, lane, edge, and center lines, arrows, and legends. The truck mounted unit for lane, edge, and center lines shall consist of a mobile self-contained unit carrying its own material capable of operating at a minimum speed of 5 miles per hour continuously during an 8-hour period while installing striping.

Hand equipment used for stop bars, cross walks, legends, directional arrows and other specialty markings shall use the same thermoplastic formulation as described above with the exception of placing the marking at a minimum thickness of 0.090 inches and a single drop of AASHTO M 247, Type 1 bead at the rate of 8 to 10 pounds per 100 square feet of stripe.

2. **Spray Thermoplastic Marking.** For lane, edge, and center lines, use truck-mounted applicator equipment consisting of a mobile self-contained unit carrying its own material capable of operating at a minimum speed of 5 miles per hour continuously during an 8-hour period while installing striping.

   Each application machine must be equipped with an automatic counting mechanism capable of recording the number of linear feet of material applied to the roadway surface with an accuracy of 0.50%, to be checked by the Engineer.

   Apply glass spheres to the surface of the completed stripe by an automatic bead dispenser attached to the striping machine in such a manner that the beads are dispensed almost instantaneously upon the installed line. The glass sphere dispenser cut-off shall be synchronized with automatic cut-off of the thermoplastic material.

B. Application

1. **Contractor's Responsibility for Notification.** Notify the Engineer before placing the thermoplastic materials. Furnish the Engineer with the manufacturer's name and batch numbers of the thermoplastic materials and glass spheres to be used. Ensure that the approved batch numbers appear on the thermoplastic materials and glass spheres packages.

2. **Application.** Before beginning application, ensure that the pavement temperature is a minimum of 50 °F and rising. Suspend application if the pavement temperature falls below 50 °F. Thoroughly clean all surfaces to be marked of all dust, dirt, grease, oil, and all other foreign matter before applying the striping.

   The pavement marking material, when formed into traffic stripes, shall be readily renewable by placing an overlay of new material directly over old markings of the same material. Such new

material shall bond itself to the old markings in a manner that will ensure no splitting or separation will take place.

Offset longitudinal lines at least 2 inches from longitudinal joints of Portland cement concrete pavements.

a. Extruded or Ribbon-Dispensed Thermoplastic Marking. To ensure optimum adhesion of thermoplastic applied on all Portland cement concrete pavements, apply a binder-sealer material as recommended by the thermoplastic manufacturer. To ensure optimum adhesion, install the thermoplastic material in a melted state at a temperature of 400 to 450 °F.

Unless otherwise shown on the Plans, maintain a minimum average film thickness of 0.100 inch for lane and edge lines on all markings. Compute this thickness on the basis of the amount of material used each day. The film thickness shall be uniform in appearance throughout its application. Apply the glass sphere top coating with a pressure type spray gun designed specifically for this purpose, and that will embed the spheres into the line surface to at least one-half their diameter.

Place Drop on Glass Beads of AASHTO M 247 Type 1 and Type 4 on the thermoplastic stripe at a rate of 8 to 10 pounds per 100 square feet of stripe.

Place the AASHTO M 247 Type 4 glass beads immediately after the first bead drop application of AASHTO M 247 Type 1 beads.

Regardless of the application methods and procedures, or pavement types, replace all pavement markings that fail to comply with these Specifications, or fail to adhere to the pavement for one year after installation, at no cost to the Department.

b. Spray Thermoplastic Marking. Before applying the pavement-marking material, remove all dirt, glaze, grease, and all other material that would reduce the adhesion of the paint to the pavement. Open-graded roadways, such as double-bituminous surface treatment (DBST), require sweeping (brooming) to ensure cleanliness.

Remove all existing material that might cause premature failure of the new material.

To ensure optimum adhesion of spray thermoplastic applied to Portland cement concrete surfaces, apply a binder-sealer material as recommended by the thermoplastic manufacturer.

The binder-sealer material shall form, when applied with conventional mobile paint spraying equipment, a continuous film over the pavement surface that will dry rapidly and adhere to the pavement surface. The binder-sealer shall be that product currently in use and recommended by the thermoplastic material manufacturer. Include all costs, including materials, associated with application of the binder-sealer, in the unit bid price for the spray thermoplastic pavement markings.

Install the pavement-marking material in a molten state, by the spray method, at a minimum temperature of 350 °F and a maximum temperature of 425 °F. Scorching or discoloration of material is cause for rejection by the Engineer. Use equipment constructed so that all mixing and conveying parts, up to and including the spray gun, maintain the material in the molten state.

Do not apply the pavement-marking materials when air and pavement surface temperatures are below 40 °F or when the surface of the pavement contains evidence of moisture.

When the plans specify 60-mil markings, apply the pavement-marking material at a thickness of not less than 0.060 inch for all roads except open-graded roadways such as DBST. For such surfaces, apply material at a thickness of not less than 0.065 inch. In no case shall the applied thickness exceed 0.075 inch.

Place the pavement-markings with adequate drop-on glass spheres in accordance with the above requirements, uniformly applied to ensure adequate nighttime reflectivity. Use a compatible combination of marking material and spheres to preclude the surface spheres from sinking deeply into the marking, or from being prematurely lost from the surface of the marking.

The producers of the thermoplastic compound and glass spheres shall furnish to the Department three copies of certified tests reports showing results of all tests specified therein and shall further certify that the materials meet all requirements.

The Department will randomly sample molten thermoplastic material for verification testing in accordance with AASHTO T 250.

3. **Temporary Marking.** When thermoplastic is used on the final surface, the Contractor may use reflectorized paint installed to permanent standards at the end of each day's work and then install the permanent marking after the paving operation is completed. Short, unmarked sections are not allowed. The Department will not directly measure and pay for temporary markings for the final surface, and will consider the costs thereof to be incidental to the item for permanent markings.

4. **Protection of Newly Applied Traffic Stripes and Markings.** Do not allow traffic onto or allow vehicles to cross newly applied pavement markings until they are sufficiently dry. Remove and replace portions of the pavement markings damaged by passing traffic or from any other cause, at no additional cost to the Department.

716.04 Raised Reflective Pavement Markers

To bond markers to the pavement, use an epoxy listed on the Department's QPL and that is approved by the marker manufacturer or a hot bituminous adhesive conforming to the requirements specified below. Do not use markers manufactured with a self-adhesive backing. Space markers as shown on the Plans. Do not install markers over joints in rigid pavements.

Furnish pavement markers of a type listed on the Department's QPL. Install the markers when the pavement is dry and the pavement temperature is no less than 50 °F.

Clean the portion of the highway surface, to which the marker is to be bonded by the adhesive, of all dirt, curing compound, grease, oil, moisture, loose or unsound layers, paint, and all other material that would adversely affect the bond of the adhesive. Perform cleaning by blast cleaning on Portland cement concrete and old bituminous pavements. Blast clean new bituminous pavement where, in the Engineer's judgment, the surface contains an abnormal amount of asphalt or the surface is contaminated with dirt, grease, paint, oil, or other material that would adversely affect the bond of the adhesive.

Melt and heat the bituminous adhesive in either thermostatically controlled double boiler type units using heat transfer oil or thermostatically controlled electric heating pots. Do not use direct flame melting units. Use a melter/applicator unit that is suited for both melting and pumping application through heated applicator hoses.

Heat the adhesive to between 375 and 425 °F, and apply it directly to the pavement surface from the melter/applicator by either pumping or pouring. Maintain the application temperature between 375 and 425 °F, as lower temperatures may result in decreased adhesion while higher temperatures may damage the adhesive.

Apply the adhesive in a puddle approximately 2/3 to 3/4 the diameter of the marker. Apply markers to the adhesive immediately (within 10 seconds) to ensure bonding. Place the marker in position by applying downward pressure until the marker is firmly seated with the required adhesive thickness and squeeze out. Remove excessive adhesive squeeze out from the pavement, and immediately remove adhesive on the exposed surfaces of the markers. Remove adhesive from exposed faces of pavement markers according to manufacturer's recommendations.

Install reflective markers so that the reflective face of the marker is perpendicular to a line parallel to the roadway centerline. Protect the markers against impact until the adhesive has hardened to the degree designated by the Engineer.

The Contractor may reheat and reuse adhesive, provided the manufacturer's recommendations regarding the pot life at application temperatures are not exceeded.

Clean out equipment and tanks using petroleum solvents such as diesel fuel or similar materials. Turn off all heating equipment before beginning cleaning operations. Remove all solvent from the equipment tanks and lines before the next use of the melter.

716.05 Snowplowable Reflective Pavement Marker

Contour the pavement at each snowplowable marker location to match the bottom of the marker casting. Install markers according to the manufacturer's recommendations. When using the dry saw method, provide a vacuum system to contain the dust. Regardless of the saw method used, ensure that the saw cut is clean, dry, and free of all dust or residue before applying the adhesive. Accompany each shipment of adhesive with a written statement from the adhesive manufacturer certifying that the material furnished conforms to the recommendations of the marker manufacturer, and stating the minimum temperature at which the adhesive can be satisfactorily mixed and applied.

716.06 Preformed Plastic Pavement Markings

Apply preformed plastic pavement markings on clean, dry surfaces free of dirt and foreign matter. Only apply markings when the pavement temperature is at least 60 °F. Should the plastic require activators for the adhesive or various special coatings for different pavement surfaces, include the cost of the activator or special coatings in the unit price of plastic.

Furnish with each package of reflectorized pavement marking materials complete instructions and specifications for applying pavement marking materials to pavement surface. Install the reflectorized pavement marking materials according to the vendor's specifications. Any adhesion used in the installation shall be as specified by the manufacturer. Use an adhesion-promoting primer when recommended by the pavement marking manufacturer.

Establish guides to mark the lateral location of pavement markings as shown on the Plans or as directed by the Engineer. The Engineer will verify the location of the guides. Place markings in proper alignment with the guides. The deviation rate in alignment shall not exceed 1 inch per 200 feet of roadway. The maximum deviation shall not exceed 2 inches, and there shall be no abrupt deviations.

Remove and replace, at no cost to the Department, markings placed that are not in the alignment or sequence as shown on the Plans or as specified

herein. Remove such markings as specified in **712.05**. Guides placed on the roadway for alignment purposes shall not establish a permanent marking on the roadway in the opinion of the Engineer.

When specified in the Contract, place markings for newly paved asphalt concrete surfaces immediately after final rolling of the mat. Use a rubber tired roller cart with a minimum weight of 200 pounds or a truck operated at no more than 3 miles per hour to ensure proper adhesion when the markings are in place. Do not use steel wheel rollers for this purpose.

716.07 Paint

A. Application of Painted Pavement Markings

Apply paint with a spray-type machine capable of satisfactorily applying the paint under pressure through a nozzle that sprays directly upon the pavement at a rate not to exceed 880 feet per minute. Equip the machine with:

1. Air blast device for cleaning the pavement ahead of the painting operation;

2. Guide pointer to keep the machine on an accurate line;

3. Device to agitate the paint;

4. Device to maintain a uniform flow and application of the paint;

5. Automatic device to provide a broken or skip line of the length required;

6. At least two spray guns capable of being operated either individually or together;

7. Automatic counting mechanism capable of recording the number of linear feet of material applied to the roadway surface with an accuracy of 0.50%, to be checked by the Engineer; and

8. Accurate meters that register quantities for both white and yellow applied paint to the nearest gallon.

When using waterborne paint, ensure the equipment is capable of heating the material from ambient air temperature to 123 °F. Equip the machine with a bead or sphere dispenser that can be regulated to dispense the spheres automatically at the uniform rate required. The equipment shall be designed and operated so as to allow traffic to safely pass on the roadbed.

Do not apply paint unless the ambient air temperature is at least 45 °F. However, if the Engineer directs that paint be applied when air temperatures are below 45 °F, heat the paint according to the manufacturer's recommendations.

For the following operations, the Engineer will not require large automatic spray application machinery meeting the preceding requirements, provided the Contractor selects pavement marking equipment capable of producing a uniform, acceptable finished product consistent with the Plans and Specifications:

1. Installation of temporary pavement markings.

2. Installation of permanent pavement markings on projects having a total length of 1,000 feet or less.

3. Installation of permanent pavement markings on an individual project segment having a total length of 1,000 feet or less on an intermittent project.

Clean the pavement surface before placing any pavement marking material.

Locate and place temporary markings on final pavement surfaces so as to underlie or coincide with the permanent pavement markings.

Perform cleaning and painting using equipment of the kind and in the manner provided by previously specified equipment. On sections where no previously applied line is available to serve as a guide or if the line is to be re-located, spot the proposed location of the new line with paint in advance of the application. On tangent sections, space the control points no more than 500 feet apart and on curves at intervals that will ensure the accurate location of the line. Leave gaps in all lines at intersections in accordance with the MUTCD or as directed by the Engineer.

Do not apply any paint over a chalk line, wire, or cord, and instead offset such guide marks from the paint line to be placed. On sections where previously applied lines are visible, use the old lines unless otherwise directed. Do not apply any paint to areas of pavement when moisture remains on the surface, or when wind conditions may cause a film of dust to be deposited on the line areas after these areas have been prepared for painting.

Apply drop-on type glass beads uniformly to the painted surface at a uniform rate of not less than 6 pounds per gallon of paint applied.

Apply paint so as to deposit a uniform wet film thickness of 0.015 inch (within a reasonable tolerance) and at a speed not to exceed 880 feet per minute. This is at the rate of 17 gallons per mile for a solid stripe 4 inches wide. Use this rate of application for all types of paint, making proper adjustments in gallons for an intermittent line or wider lines. Ensure that the quantity of paint does not under-run the designated amount by more than 5%. If a check of the rate of application indicates a greater variation, stop the work until the paint machine is properly adjusted or replaced. This percent of variation is set out to give the Contractor some leeway in starting the job and in getting the machine in adjustment; it is not expected that there will be either a continuous overrun or under-run, but that the final average rate of application will closely approach the rate established above.

When reflectorized paint is required for temporary or final marking, install the paint to permanent standards at the end of each day's work. Do not leave any short, unmarked sections.

Protect traffic lines and markings. Place warning and directional signs as shown on the Plans or as directed by the Engineer to control traffic in the marking area. If the drying time of the material being used exceeds 60 seconds, protect the newly applied markings by placing traffic cones or other approved warning devices at frequent intervals as directed. Leave these devices on the line until the material is dry or firm enough not to track or receive impressions from normal traffic. Remove these devices as soon as possible to prevent a traffic hazard. Do not leave such devices in the roadway overnight. If so directed, provide flaggers to direct traffic.

Apply paint to appear as clearly delineated lines with minimal crookedness and waviness, giving due consideration to the contours and roughness of the pavement. Segments of broken line stripe shall

square off positively at each end. The paint lines shall be without mist, drip, or splatter. Remove and/or correct, to the Engineer's satisfaction and at no additional cost to the Department, lines that do not meet these requirements when placed.

Operate the paint equipment so that it will be unnecessary for traffic to cross the newly painted line behind the equipment in order to safely pass the painting machine, and so as to allow traffic to keep moving at all times.

B. Removal of Painted Markings

Remove painted pavement markings where specified or directed by the Engineer. Obtain the Engineer's approval of the paint removal method before beginning the work. Do not remove existing painted pavement markings by painting over them with black paint or asphalt.

When the method of removal causes sand or other material to accumulate on the pavement, remove the residue as the work progresses. Remove painted markings by methods that cause the least possible damage to the pavement. Repair damage to the pavement or surface caused by pavement marking removal as directed by the Engineer and at no cost to the Department.

Where a plastic marking will replace the painted marking and paint removal is specified in the Contract, remove enough of the paint to ensure proper installation of the plastic. The paint removal shall be uniform and shall expose a minimum of 75% of the surface area that is to receive the plastic materials.

COMPENSATION

716.08 Method of Measurement

A. Pavement Marking (Broken lane lines), Pavement Marking (Dotted line), and Pavement Marking (Transverse Shoulder)

The Department will measure the length of each of these markings, complete in place and accepted, as listed in the bid schedule, along the center of each line. Only the marked line will be measured for payment.

B. Pavement Marking (Solid barrier line)

The Department will measure the length of solid barrier line, complete in place and accepted, along the center of each line. Where double solid barrier lines are used, each solid barrier line will be measured separately for payment.

C. Pavement Marking (Crosswalk Striping)

The Department will measure the length of crosswalk striping, complete in place and accepted, along the centerline of the crosswalk. The Department will not separately measure boundary lines on crosswalk.

D. Pavement Marking (Channelization Striping)

The Department will measure Channelization Striping, including the boundary lines, complete in place and accepted, by the square yard.

E. Pavement Marking (Stop line)

The Department will measure the length of stop lines, complete in place and accepted, in linear feet to the nearest foot along the centerline of the stop line.

F. Pavement Marking (Designs)

The Department will measure designs or lettering by the unit, per each, complete in place or as stipulated in the Contract and shown on the Plans.

G. Raised Reflective Pavement Markers and Snowplowable Reflective Pavement Markers

The Department will count the number of each type of pavement markers installed as directed and accepted.

H. Removal of Existing Painted Line

The Department will measure the removal of broken lane line and solid barrier line along the center of each line. Only the painted line will be measured for payment.

Adhesives will be considered incidental to the installation of raised reflective pavement markers and snowplowable reflective pavement markers.

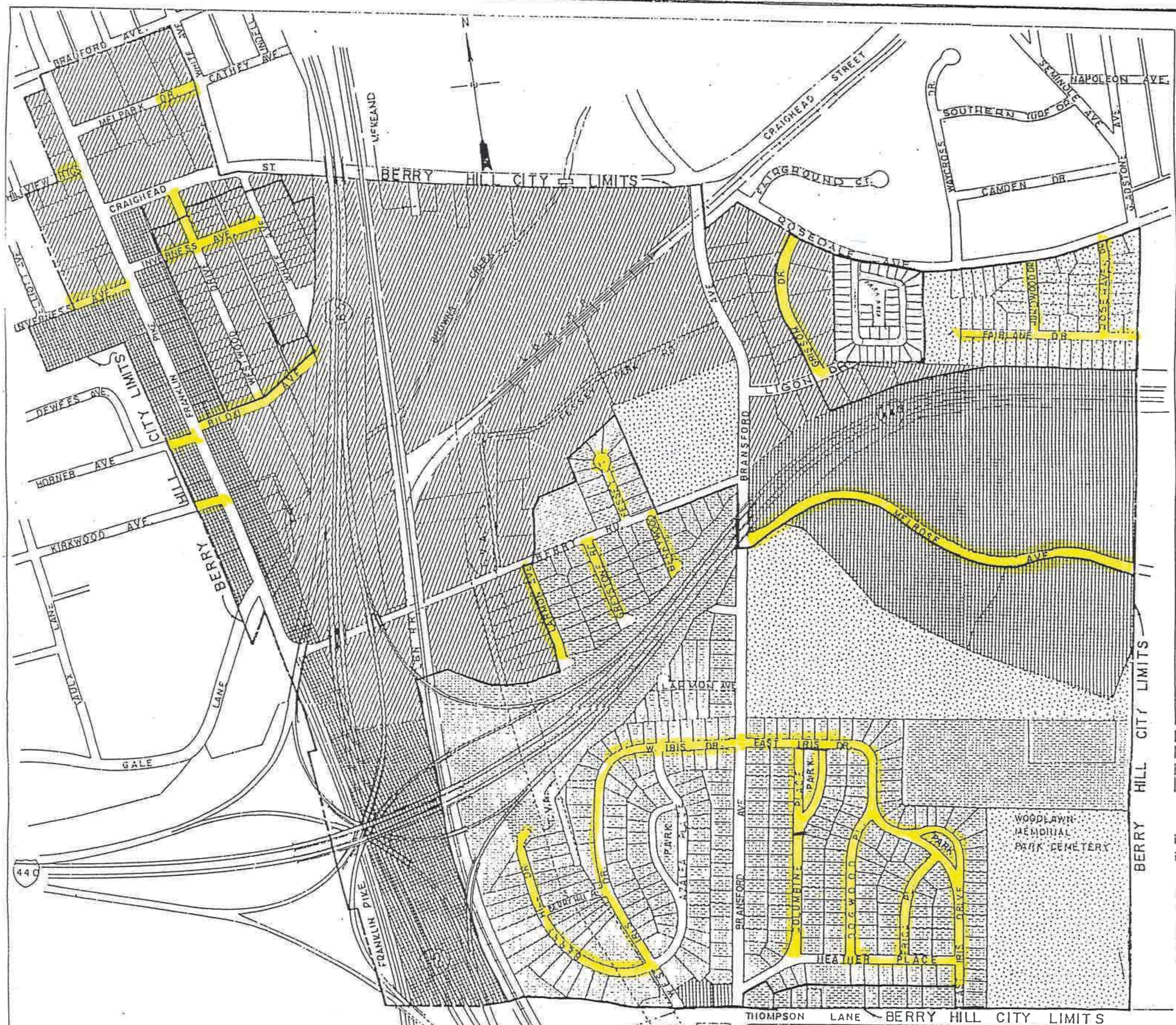
716.09 Basis of Payment

The Department will pay for accepted quantities, complete in place, at the contract prices as follows:

Item	*Pay Unit*
Plastic Pavement Marking (__" Dotted Line)	Linear Feet
Plastic Pavement Marking (Transverse Shoulder)	Linear Feet
Plastic Pavement Marking (__" Barrier Line)	Linear Feet
Plastic Pavement Marking (Cross-Walk)	Linear Feet
Plastic Pavement Marking (Stop Line)	Linear Feet
Plastic Pavement Marking (Channelization Striping)	Square Yard
Painted Pavement Marking (__" Barrier Line)	Linear Feet
Painted Pavement Marking (Cross-Walk)	Linear Feet
Painted Pavement Marking (Stop Line)	Linear Feet
Painted Pavement Marking (Channelization Striping)	Square Yard
Plastic Pavement Marking (Word or Design)	Each
Raised Pavement Marker (Description)	Each
Snowplowable Pavement Marker (Description)	Each
Removal of:	
Pavement Marking (Dotted Line)	Linear Feet
Pavement Marking (Transverse Shoulder)	Linear Feet
Pavement Marking (__" Barrier Line)	Linear Feet
Pavement Marking (Cross-Walk)	Linear Feet
Pavement Marking (Stop Line)	Linear Feet
Pavement Marking (Channelization Striping)	Square Yard
Pavement Marking (Word or Design)	Each

Such payment is full compensation for layout, materials, labor, equipment, tools, royalties, and all other incidentals necessary to complete the work.

CITY OF BERRY HILL



CERTIFIED

THE UNDERSIGNED MEMBERS OF THE MUNICIPAL ZONING AND PLANNING COMMISSION DO CERTIFY THIS MAP AS THE ZONING MAP OF THE CITY OF BERRY HILL, DAVIDSON COUNTY, TENNESSEE.

DATE *April 6, 199[illegible]*

APPROVED

MAYOR	VICE-MAYOR	COMMISSIONER

ZONING DISTRICTS SYMBOLS

RESIDENTIAL A	COMMERCIAL A	COMMERCIAL B	INDUSTRIAL A

ZONING MAP

CITY OF BERRY HILL

DAVIDSON COUNTY, TENNESSEE

100 0 100 300 500

SCALE IN FEET