

REQUEST FOR PROPOSAL

SPECIFICATIONS

AND

CONTRACT AGREEMENT

FOR

FY17-500-04

BONDED WEARING COURSE TREATMENT-FY17



**CITY OF MANCHESTER
DEPARTMENT OF PUBLIC WORKS
HILLSBOROUGH COUNTY**

2016

HIGHWAY COMMISSION

Hal Sullivan	Chairman
Rick Rothwell	Vice-Chairman
Bill Skouteris	Clerk
Toni Pappas	Commissioner
Patrick Robinson	Commissioner

Kevin A. Sheppard, P.E. . . . Public Works Director

CITY OF MANCHESTER

New Hampshire

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and
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FY17-500-04

Prepared by

CITY OF MANCHESTER, NEW HAMPSHIRE
DEPARTMENT OF PUBLIC WORKS
HILLSBOROUGH COUNTY

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**City of Manchester
Department of Public Works
475 Valley Street
Manchester, New Hampshire**

INVITATION FOR PROPOSALS

Sealed proposals will be received from prequalified contractors at the office of the Department of Public Works of the City of Manchester, New Hampshire before or at **2:00 P.M.**, prevailing time on the **28th** day of **June, 2016** for the following described services:

**BONDED WEARING COURSE TREATMENT-FY17
FY17-500-04**

The City of Manchester is accepting proposals the application of bonded wearing course, chip seal and cape seal treatments to various City roadways

Certified Check/Bid Bond \$10,000

Plans and specifications may be seen at the office of the Department of Public Works, at the following locations:

- Department of Public Works, 475 Valley Street, Manchester, NH 03103
- Dodge Reports, 880 Second Street, Manchester New Hampshire, 03102
- Associated General Contractors of N. H., 48 Grandview Road, Bow, N.H. 03304
- Works in Progress, 20 Farrell Street, Suite 103, So. Burlington, VT 05403
- Construction Summary of N.H., 734 Chestnut Street, Manchester, N.H., 03104
- F.W. Dodge Company, 24 Hartwell Avenue, Lexington, MA. 02173

All individuals, firms, partnerships or corporations intending to bid, must be prequalified for the project. Prequalification forms may be obtained at the Office of the Department of Public Works for five (\$5.00) dollars or from our website at:

<http://www.manchesternh.gov/purchasing>. Sealed Prequalification Statements will be received at the Office of the Department of Public Works until **5:00 P.M.** prevailing time on **Tuesday, June 21, 2016**.

Specifications and proposal forms may be obtained on the City's website at www.manchesternh.gov, or may be obtained at the Office of the Department of Public Works for twenty-five (\$25.00) dollars cash or check, non-reimbursable. The check shall be made payable to: "Department of Public Works, City of Manchester, N.H."

Proposals must be completed in both words and numerals on regular proposal forms, which shall be submitted in a sealed envelope marked: "Proposal for "**BONDED WEARING COURSE TREATMENT- FY17**", addressed and delivered to the

Department of Public Works not later than the date and time mentioned above, at which time they will be publicly opened and read aloud.

Proposals must be accompanied by a Certified Check or Bid Bond in the amount listed above, payable to: "Department of Public Works, City of Manchester, N.H.", as security for the execution of the contract.

A Performance and Payment Bond each in the amount of 100 percent of the contract price will be required of the successful bidder.

The City of Manchester is an equal opportunity/affirmative action agency. All qualified bidders will receive consideration without regard to race, color, religion, creed, age, sex, or national origin. The City hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin, sex, age, or disability in consideration for an award.

The right is reserved to waive any informalities in or reject any or all proposals and to accept the bid that is deemed most favorable to the interest of the City of Manchester.

A \$5.00 non-refundable mailing fee will be charged for plans mailed to any contractor. Checks should be mailed to Department of Public Works, 475 Valley Street, Manchester, N.H. 03103.

Questions regarding this Invitation to Bid should be directed to Mr. David Winslow, at (603) 624-6444.

Department of Public Works, City of Manchester, N.H.

By: HIGHWAY COMMISSION

Hal Sullivan, Chairman

Rick Rothwell, Vice-Chairman
Toni Pappas, Commissioner

Bill Skouteris, Clerk
Patrick Robinson, Commissioner

Kevin A. Sheppard, P.E.
Public Works Director

INSTRUCTIONS TO BIDDERS

GENERAL:

1. Bids will be received by the City of Manchester, New Hampshire at the place and until the time specified in the Invitation to Bid and then publicly read aloud for the information of bidders and others properly interested who may be present either in person or by representative. **NO PROPOSALS WILL BE ACCEPTED AFTER TIME AND DATE SPECIFIED.**
2. The following meanings are attached to the defined works when used in this document:
 - a. The word "**City**" means City of Manchester, New Hampshire.
 - b. The word "**Bidder**" means the person, firm, or corporation submitting a proposal on these specifications or any part thereof.
 - c. The word "**Contractor**" means the person, firm, or corporation with whom the Contract is being made by carrying out the provisions of this Sealed Bid Invitation and the Contract.
 - d. The words "**firm price**" shall mean a guarantee against price increase during the life of the Contract.
3. Strict compliance with the requirements of the Invitation to Proposal, terms and conditions, and the instructions printed is necessary. All blank spaces must be filled in. Signatures of the responsible owner/representative of the firm must be in ink. No reproductions/duplications/copies will be accepted.
4. Each proposal must give the full business address of Bidder and be signed by him with his usual signature. Proposals by partnerships must furnish the full names of all partners and must be signed with the partnership name by one of the members of the partnership or by an authorized representative, followed by the signature and title of the person signing. Proposals by corporations must be signed with the legal name of the corporation, followed by the state of incorporation and by the signature and title of president, secretary, or other person authorized to bind it in the matter. The name of each person signing shall also be typed or printed below the signature. A bid by a person who affixes to his signature the word "president", "secretary", "agent", or other title without disclosing his principal may be held to be the bid of the individual signing. When requested by the City, satisfactory evidence of the authority of the officer signing on behalf of the corporation shall be furnished. All Bids must be signed by an authorized, responsible officer or employee having the capacity to enter into contracts.

5. Proposals must be securely sealed in a suitable envelope, (facsimile or electronic submissions will not be accepted) addressed and marked on the outside as follows:

**Bonded Wearing Course Treatment- FY17
FY17-500-04**

6. Bidders' names and address must appear on the upper left hand corner of the sealed envelope.
7. The entire solicitation document is to be returned when submitting a Proposal, unless otherwise directed by the solicitation document. Failure to return all pages may result in a determination that the submittal is non-responsive.

PLEASE NOTE: THE CITY OF MANCHESTER IS NOT RESPONSIBLE FOR PROPOSALS NOT PROPERLY MARKED.

8. It will be the responsibility of the Bidder to see that their bid is received by the Department of Public Works, Parks, Recreation and Cemeteries Division as specified.
9. Each Proposal is received with the understanding that the acceptance in writing by the City of the Bidder to furnish any or all of the services described therein or as otherwise negotiated shall constitute a contract between the Bidder and the City.
10. A contract agreement that is customarily employed by the City will be used and will incorporate the original solicitation with all terms, condition and specifications of the sealed Proposal. A copy of the contract agreement is attached hereto.
11. Proposals may be withdrawn upon written or electronic request received from Bidders prior to the time affixed for opening. Negligence on the part of the Bidder in preparing the bid confers no right for the withdrawal of the Proposal after it has been opened.
12. The solicitation document maintained by the Purchasing Division, in the bid file folder, shall be considered the official copy. In the case of any inconsistency between Proposal documents submitted to the City, but not clearly listed on the exception page of the document or as an exception by the Bidder, the language of the official copy shall prevail. Furthermore, any exception or changes to the specifications made by the Bidder may be cause to disqualify your Proposal.
13. Award will be made in the best interest of the City taking into consideration factors set forth in the City of Manchester Procurement Code. Upon making an award, or giving notice of intent to award, the City will place appropriate notice on the Purchasing Website: www.manchesternh.gov/bids.

14. No oral interpretations will be made to any Bidder as to the meaning of the specifications or terms and conditions of this sealed Proposal. Every request for such interpretation or request for a change in the specifications or terms and conditions shall be made in writing, addressed and forwarded to:

Email: dwinslow@manchesternh.gov

Subject: Bonded Wearing Course Treatment – FY17

Seven (7) or more business days before the date affixed for opening of Proposals. Any questions received after that date will not be answered. Every interpretation made to a Bidder will be in the form of an addendum to the Sealed Proposal Invitation which, if issued, will then be posted on the website: www.manchesternh.gov/bids. All such addenda shall become part of the complete Sealed Proposal Invitation. It is the Bidder's responsibility to check the website prior to the submittal deadline to ensure that the Bidder has a complete, up-to-date Proposal package.

15. Proposals that are incomplete, not properly endorsed or signed, or otherwise contrary to these instructions may be rejected as informal by the City. The Proposal must be filled out completely and accurately.
16. Any changes and/or corrections shall be marked in red and initialed by the person making such corrections.
17. Unless otherwise negotiated, no additional charges shall be passed to the City, including any applicable taxes, delivery or surcharges.
18. As the City is exempt from the payment of federal excise taxes, all prices quoted herein are not to include these taxes.
19. The services on which Proposals are submitted must be of such character, quality and/or performance equivalence that it will serve as that specified. In submitted Proposals on services other than as specified, Bidder shall furnish complete data and identification with respect to the alternate services they propose to furnish.
20. Consideration will be given to Proposals submitted on alternate services to the extent that such action is deemed to serve the best interests of the City. The Bidder must furnish any information (specifications or test results) which will help in determining whether an item is equal or superior to our bid standards. If the Bidder does not indicate that the services he proposes to furnish is other than specified, it will be construed to mean that the Bidder will furnish the exact services described.
21. Should the Contractor fail to meet the deadline set forth in specifications the City reserves the right to procure services from other sources and hold Contractor liable for any excess costs.

22. The apparent silence of these specifications and any supplemental specifications as to any detail or the omission from the specifications of a detailed description concerning any point shall be regarded as meaning that only the best commercial practices are to prevail and correct type, size and design are to be used. All interpretations of these specifications shall be made on the basis of this statement.
23. The Bidder certifies that no official or employee of the City or State of New Hampshire has a pecuniary interest in the bid or in the Contract that the Bidder offers to execute or in the expected profits to arise there from, and that this bid is made in good faith without fraud or collusion or connection with any other person submitting a bid.
24. The City reserves the right to waive any informality in any Proposal, to reject any and all Proposals wholly or in part, and to make awards in a manner deemed in the best interest of the City.
25. Bid security, in the form of a bid bond, deposit of cash, or certified check, bank cashier's or bank official's check drawn on a solvent bank, payable to the "City of Manchester" in the required amount (see specifications) must accompany each Proposal as a guarantee that if the Proposal is accepted a contract will be entered into. Such deposits of all Bidders will be held by the City until all Proposals submitted shall have been canvassed and the Proposals have either been rejected in whole or in part or the award of the contract has been made. The bid deposit of the successful Bidder will be held until a contract is duly executed. Bid deposits will be returned to unsuccessful bidders within two (2) weeks after execution of the contract. If the successful Bidder to whom a contract shall have been awarded refuses to execute the Contract and to furnish the insurance certificate and performance and/or payment bonds herein described within the ten (10) business days after award of the Contract, the amount of the bid deposit shall be forfeited to and retained by the City as liquidated damages for such neglect or refusal.
26. The successful Bidder will be required to furnish a bond or certified check on a solvent bank payable to the: "City of Manchester" in the required amount (see specifications) as a guarantee of the faithful performance thereof. The Bonding Company shall be authorized to conduct business in the State of New Hampshire by the State of New Hampshire's Insurance Commissioner.
27. The successful Bidder will be required to furnish a payment bond or a certified check on a solvent bank payable to the "City of Manchester" in the required amount (see specification) as security for the payment of all labor performed or furnished, and for all materials used in the fulfillment of said contract. The bonding company shall be authorized to conduct business in the State of New Hampshire by the State of New Hampshire.
28. The Bidder, if awarded an order or contract, agrees to defend, indemnify, and hold harmless the City from all damages to life and property arising out of the

performance of this Contract due to the Bidder's negligence, that of his employees, subcontractors, etc., or due to the negligence of the City, its employees, representatives, agents, etc.

29. The City of Manchester may withhold acceptance of or reject any merchandise which is found, upon examination, not to meet the specification requirements. When rejected, it shall be removed by the Contractor within ten (10) days after notification of rejection.
30. Assignment of Contract: A contract shall not be assignable by the Contractor in whole or in part without the written consent of the Public Works Director or designee.
31. The Revised Statutes Annotated of the State of New Hampshire, the Charter of the City, and all City Ordinances insofar as they apply to the laws of competitive Bids, contracts and purchases are made a part hereto.
32. All deliveries of commodities hereunder shall comply in every respect with all applicable laws of the Federal Government and/or the State of New Hampshire.
33. The Bidder to whom a contract is awarded guarantees to the City that all warranties of merchantability and fitness for a particular purpose as provided for in New Hampshire 382A-2-314 and 2-314 shall remain in force and will not be disclaimed.
34. Payment Terms:
 - a. The successful bidder shall keep accurate, document records of time, material and transportation allocable to the Contract. Related records will be available for audit purposes during normal business hours, as often as deemed necessary. Invoices for review and payment must be submitted no later than the 25th of the month to allow payment on the 15th of the following month.
 - b. Requests for payment must be submitted to:

**Mr. David L. Winslow
Department of Public Works
475 Valley Street
Manchester, NH 03103**

35. The Public Works Director may terminate the contract for breach by the Contractor of any of the provisions of the contract by giving the Contractor ten (10) days' notice by registered mail.

36. The City may terminate the Contract at any time by giving written notice to Contractor of such termination and specify the effective date thereof, at least ten (10) days before the effective date of such termination.

**FAILURE TO COMPLY WITH THESE REQUIREMENTS COULD RESULT IN
THE CANCELLATION OF AN ORDER OR CONTRACT**

STANDARD SPECIFICATIONS FOR ROAD, DRAIN & SEWER CONSTRUCTION

These specifications are intended to relay to developers, contractors and other builders and trades, information concerning the Department of Highways' requirements relative to all construction under its jurisdiction in the City of Manchester, NH.

To facilitate this end, the Standard Specifications have been divided into three parts as follows:

PART I -- PUBLIC IMPROVEMENTS

Part I of the Standard Specifications outlines the Department's requirements concerning public improvements included in site development and subdivision projects. These requirements shall also apply to off-site improvements conducted within streets, rights-of-way, easements or other public lands belonging to the City of Manchester, New Hampshire.

All work relative to the above shall be conducted according to Section V of this part and the Technical Specifications as outlined in Part III.

PART II -- CONTRACT GENERAL PROVISIONS

Part II of the Standard Specifications outlines the Department's contractual requirements concerning work for road, drain and sewer projects along with other related work. These requirements shall apply to all such work contracted by the City of Manchester, Department of Highways and shall be considered a part of all proposals.

PART III -- TECHNICAL SPECIFICATIONS

Part III of the Standard Specifications outlines the Department's detailed requirements concerning the control of material, rules of construction and basis of payment. Supplemental Specifications not yet considered standard and Special Provisions for explaining items of work unique to a specific project, will be included in the proposal forms prepared by the Department.

The sections included in this part along with any Supplemental Specifications and Special Provisions, shall be considered a part of all proposals.

BID SECURITY

The undersigned agrees to comply with the requirements as to the conditions of employment, wage rates and hours of labor set forth in the Form of "Contract Agreement". The undersigned hereby agrees to complete all the work shown or specified under this contract and as shown on the contract drawings within 365 consecutive calendar days from the date specified in the Notice to Commence Work and he further agrees that the OWNER may retain from the moneys that are or which may become due an amount of two hundred dollars (\$200.00) plus engineering charges for each and every calendar day (Sunday and holidays excluded) of time consumed in completing the work beyond the time conditions stipulated above or any extension of time that is duly authorized and such amount so to be retained, is hereby agreed to be liquidated damages accruing to the OWNER incident to such delay.

The undersigned agrees that if he is selected as CONTRACTOR, he will within ten (10) days, (Saturdays, Sundays and legal holidays excluded) after presentation thereof by the "Awarding Authority", execute a contract in the form attached hereto and furnish a Performance Bond and also a labor and materials or Payment Bond, each of a surety company registered and licensed to do business in the State of New Hampshire and satisfactory to the OWNER and each in the sum of at least one hundred percent (100%) of the contract price, the premiums for which are to be paid by the CONTRACTOR and are included in the bid price.

The undersigned understands that the OWNER reserves the right to reject any and all bids and to waive any informalities in the bidding.

Contractor's Signature

Title

Date

Certificate of Acknowledgment of Contractor, if a Corporation

State of _____,

ss:

County _____,

On this ____ day of _____, 2016

before me personally came _____

to me known, who being duly sworn did say as follows:

that he resides at: _____

and is the _____

of _____

the corporation described herein and which executed the foregoing instrument; that he knows the corporate seal of said corporation; the seal affixed to the foregoing instrument is such corporate seal and it was so affixed by order of the Board of Directors of said corporation and by the like order, he signed thereto his name and official designation.

Notary Public (seal)

My commission expires: _____

PROPOSAL

BONDED WEARING COURSE TREATMENT

The City of Manchester acting through its Department of Public Works hereinafter called the "Awarding Authority", requests bids for the furnishing of all labor, equipment and materials required for the construction of the "**BONDED WEARING COURSE TREATMENT –FY17**" in accordance with the plans and specifications prepared by the City of Manchester, Department of Public Works.

The Bidder declares that the attached Proposal therein referred to has been carefully examined and is understood. It is proposed and agreed, if the bid is accepted, to Contract with the Owner to the required work in the manner set forth.

The undersigned as Bidder declares that the only person or parties interested in this proposal as principals are those named herein; that this Proposal is made without collusion with any other firm, that the undersigned has carefully examined the location of the proposed work, the proposed form of contract and the plans and specifications therein referred to, and the undersigned proposes and agrees if this Proposal is accepted, he will contract with the "Awarding Authority" to provide all the necessary labor, machinery, tools, apparatus and other means of construction to do all the work and furnish all the materials specified in the contract in the manner and time therein described and according to the requirements of the Engineer therein set forth and the undersigned will take full payment therefore, the following unit and total prices:

Total price of this Proposal (for comparison of bids) based on the estimated quantities is:

_____ \$ _____
Total Price In Words Total Price In Figures

CONTRACTOR: _____

BY: _____

TITLE: _____

It is agreed that the total price presented above is to be used solely for the comparison of bids to determine the apparent low bidder.

Addendums received _____

PROPOSAL

The undersigned agrees that this Bid shall be good and may not be withdrawn for a period of sixty (60) calendar days after the scheduled closing time for receiving bids.

This Proposal includes Addenda No.: _____

Contractor (Bidder) (seal)

By: _____
(Signature and Title)

Address: _____

Being a (corporation incorporated)
(under the laws of the)
(State of _____)
(Partnership,)
(Individual)

Composed of Officers, partners, or
owner, as follows:

CITY OF MANCHESTER
Department of Public Works

INFORMATION REPORT

PROJECT: BONDED WEARING COURSE TREATMENT – FY17

DATE BIDS OPENED: **At 2:00 P.M., June 28, 2016**

PROJECT TYPE: Application of bonded wearing course to various City roadways

CONTRACT PERIOD: The contract period for this project shall be 365 calendar days beginning at the date of notice to proceed.

PROPOSAL GUARANTEE: \$10,000.00

Bid Item Number	Estimated Quantity	Unit	Description (Bid Price in Words)	Unit Price (Bid in Figures)	Total Price (Bid in Figures)
415.1	25,000	SY	CONVENTIONAL BONDED WEARING COURSE _____dollars and _____cents per SY.		
602.55	200	EA	ADJUSTING MH AND CB FRAMES _____dollars and _____cents per EA		
618.109	1	ALL	UNIFORMED OFFICERS AND FLAGMEN Ten Thousand dollars and no cents. per ALL.	\$10,000	\$10,000.00
619	1	L.S.	MAINTENANCE OF TRAFFIC _____dollars and _____cents per L.S.		
629	1	ALL	TESTING OF MATERIALS One Thousand Dollars and no cents per ALL.	\$1,000.00	\$1,000.00
632.0104	5,000	LF	REFLECT. PAINT , 4" SINGLE SOLID LINE _____dollars and _____cents per LF.		
632.0204	5,000	LF	REFLECT. PAINT , 4" SINGLE BROKEN LINE _____dollars and _____cents per LF.		
632.0304	10,000	LF	REFLECT. PAINT , 4" DOUBLE SOLID LINE _____dollars and _____cents per LF.		
632.0504	5,000	LF	REFLECT. PAINT , 4" DOUBLE LINE (SOLID W/ BROKEN) _____dollars and _____cents per LF.		
632.3112	500	LF	REFLECT. THERMOPLASTIC, 12" SINGLE SOLID LINE _____dollars and _____cents per LF.		
632.36	1,000	SF	REFLECT. THERMO, ARROW, WORD OR SYMBOL _____dollars and _____cents per SF.		

632.8	1	LS	TEMP. RAISED PLASTIC PAVEMENT MARKERS _____dollars and _____cents per LS		
632.9	3,000	SF.	OBLITERATE PAVEMENT MARKING _____dollars and _____cents per SF.		
692	1	L.S.	MOBILIZATION _____dollars and _____cents per L.S.		
900	24	HR	STREET SWEEPING _____dollars and _____cents per HR		
TOTAL BID (in Words)	_____ _____ _____ _____				

Schedule of Unit Costs

Bidder shall provide the following Unit Prices. The prices shall be used for informational purposes only and will not be included in the Total Bid amount above.

1. SINGLE CHIP SEAL TREATMENT \$ _____ /SY
MINIMUM QUANTITY _____ SY

2. ASPHALT RUBBER BONDED WEARING COURSE \$ _____ /SY
MINIMUM QUANTITY _____ SY

BID BOND

**BONDED WEARING COURSE TREATMENT – FY17
FY17-500-04**

The undersigned as bidder, understands and agrees that the quantities of work as given for each item in this Proposal are only approximate and are assumed solely for the comparison of proposals. They are not guaranteed to be accurate statements or estimates of the quantities of work to be performed under this contract and any departures therefrom, will not be accepted as valid grounds for any claim or loss of profits. In case of variation between unit prices and total prices stated by the bidder, the unit prices will be considered to be his bid.

The undersigned further agrees to comply with the requirements as to conditions of employment, wage rates and hours of labor set forth in the form of Contract Agreement.

The undersigned agrees that if he is selected as CONTRACTOR, he will, within ten (10) days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the awarding authority, execute a contract in the form attached hereto and furnish a Performance bond and also a labor and materials or Payment Bond, each of a surety company registered and licensed to do business in the State of New Hampshire satisfactory to the "Awarding Authority" and each in the sum of at least one hundred percent (100%) of the contract price, the premiums for which are to be paid by the Contractor and are included in the various unit prices bid.

Accompanying this Proposal under separate cover is Ten Thousand Dollars (\$10,000.00) in the form of a Bid Bond, Cashier's Check or Certified Check* payable to the Department of Public Works of the City of Manchester.

The undersigned understands that the OWNER reserves the right to reject any and all bids and to waive any informalities in the bidding.

*Bidder will cross out words which do not apply.

Contractor's Signature Date

Title

**BONDED WEARING COURSE TREATMENT-FY17
FY17-500-04**

PROSECUTION OF THE WORK

Description of the Work:

This contract consists of the Application of bonded wearing course and chip seal treatments to various City roadways.

Utilities:

There are utility installations in the project area belonging to, but not necessarily limited to, the following:

<u>Company</u>	<u>Address</u>	<u>Telephone</u>
Comcast	751 E Industrial. Dr., Manchester	626-9900
National Grid	130 Elm Street, Manchester	625-4000
Manchester Fire Dept.	100 Merrimack St., Manchester	669-2256
Manch. Water Works	281 Lincoln St., Manchester	624-6494
Fairpoint Communications	100 Gay Street, 2 nd Fl, Manchester	645-2700
Eversource	12 Bellemore Drive, Bedford	1-800-662-7764

Prosecution:

It is understood that the Contractor will match his work schedule with that of the Department of Public Works and other utility companies as applicable.

Due to the limited funding for this work, the City reserves the right to delete any part of the work in order to keep expenditures within the limits of available funds.

Contractor and City Will coordinate with the utility companies on the adjustments to gate valve boxes as needed.

Traffic Control

Traffic control by uniformed officers shall be in accordance with Section 618 of the Standard Specifications, and will be paid as an allowance under the appropriate pay item.

The placement and use of construction signs and warning devices, cones, delineators, etc. to maintain safe passable traffic during work shall be paid for under the lump sum Item 619 – Maintenance of Traffic.

Public Convenience and Property Protection

The Contractor shall be aware that he will be required to maintain access to all properties in the project area at all times.

The Contractor will be responsible for the proper and timely notification to local residents and businesses should any temporary interruption of their access or services be absolutely necessary.

Contract Documents

In the event of a conflict of interpretation in the Contract Documents, the following is the general order of precedence:

1. Special Contract Requirements*
 2. Special Provisions
 3. Supplemental General Conditions
 4. General Conditions
 5. Supplemental Specifications,
 6. Specifications.
 7. Drawings
- *Includes Prosecution of Work, Traffic Control plan and Special Attentions.

Contract Period: The contract period for this project shall be 365 calendar days, beginning at the date of execution of the contract.

SUPPLEMENTAL SPECIFICATION

SECTION 415 – BONDED WEARING COURSE SURFACE TREATMENT

Description

1.1 This work shall consist of installation of a Bonded Wearing Course (BWC) surface treatment consisting of a warm polymer modified asphalt emulsion bond coat sprayed on the surface followed immediately with an ultra-thin hot mix asphalt wearing course.

Materials

2.1 Mixture Requirements. The Contractor shall formulate and submit to the Engineer, a Job Mix Formula (JMF) that satisfies the design general limits listed in Table 415-1. The production tolerances customarily used by the City for HMA shall apply, but shall not fall outside the Master Range following gradation requirements.

It is intent to utilize Type B mixes unless directed in writing by the Engineer.

Table 415- 1 - Master Range and Production Tolerance

Sieve Size	Master Range Type B (3/8")	Master Range Type C (1/2")	Production Tolerance
3/4" (19 mm)	-	100	± 0.0
1/2" (12.5 mm)	100	85 – 100	± 0.0 / ± 7.0
3/8" (9.5 mm)	85 – 100	45 – 85	± 7.0 / ± 7.0
#4 (4.75 mm)	24 – 41	24 – 41	± 7.0
#8 (2.36 mm)	21 – 33	21 – 33	± 4.0
#16 (1.18 mm)	15 – 26	15 – 26	± 4.0
#30 (0.60 mm)	11 – 20	11 – 20	± 4.0
#50 (0.30 mm)	8 -16	8 -16	± 4.0
#100 (0.15 mm)	5 – 10	5 – 10	± 4.0
#200 (0.075 mm)	4 – 7	4 – 7	± 2.0
% PGAB	4.8 – 5.3	4.8 – 5.3	± 0.4

*Note: All aggregate percentages are based on the total weight of the aggregate.

2.2 Asphalt Binder. Bituminous materials shall meet the requirements of AASHTO M 320. Producers and suppliers of asphalt binders shall comply with the requirement of AASHTO R 26. Asphalt binder suppliers shall have a quality control plan that complies with AASHTO R 26.

The grade to be used shall conform to the material type ordered as defined below:

- a. **Conventional Bonded Wearing Course (BWC)** shall meet standard PG 64-28 grading requirements.

b. **The Polymer Modified Bonded Wearing Course (BWC-P)** shall meet PG 64V-28 or PG 70-28 grading requirements.

- The polymer additive shall consist of unvulcanized SBR (styrene-butadiene-rubber) in liquid latex form, with a minimum quantity of rubber solids of 3% by weight of the performance grade asphalt binder (PGAB) content of the mix. The PG 64-28 shall be modified to produce a PGAB grade of 70-28 (+/- 2°).
- Quantity: 3% rubber solids by weight of the bitumen content of the mix. If the latex polymer is 70% solids, weight per gallon is 7.69 lbs. = 5.38 lbs. solids per gallon. If mix calls for 6% bitumen, 3% - 3.6 lbs. of latex solids per ton mix or 0.70 gallons of latex per ton of mix. The latex polymer modified asphalt binder shall be injected into the mix at the time of manufacture. In a drum plant, the liquid latex polymer shall be pumped into the asphalt binder through a spud welded to the asphalt binder line just prior to where it enters the drum. The constant rate at which the latex polymer is pumped shall be determined by the mix speed of the drum. In a batch plant, the polymer is pumped directly into the mix five (5) seconds after the asphalt binder starts to dump into the pug mill. Mix time per batch after polymer is pumped in is 45 to 60 seconds.
- The plant shall be equipped with an in-line blender and a sample cock for Quality Control and Acceptance purposes.
- A metering system shall be attached to a printer which prints a time and date stamp, latex flow rate and cumulative polymer usage during the HMA production, allowing the Engineer to reference the injection rate and latex used against the plant's projection rate. The printout shall be set for a five minute interval. The latex polymer manufacturer will have a professional representative available at the HMA plant during the first day of mix production and placement, and as required thereafter by the Engineer.
- The manufacturer of the SBR latex shall provide certified test results for Styrene Butadiene ratio, total rubber solids percentage by weight, pH, ash content, and viscosity to the Engineer prior to mix production.
- Mix conforming to the requirements of these specifications shall be placed when the ambient temperature is 50°F and rising when measured in the shade away from artificial heat.
- Mixing temperature shall be 290°F to 325°F unless otherwise specified by the Engineer. Mix shall be placed at between 275°F and 310°F or per manufacturer recommendations.

c. **The Asphalt Rubber Bonded Wearing Course (BWC-AR)** shall utilize an Asphalt-Rubber binder which conforms to ASTM D 6114 type II specifications. A post-blended SBR (styrene-butadiene-rubber) may be used as discussed herein.

- Base Asphalt Binder shall have a PG (Performance Grade) of PG64-28 and meet the requirements of ASTM D 6114 (type II). PG58-28 may be used as required at the discretion of the Engineer.

- Asphalt-Rubber Binder: The minimum percentage of ground rubber shall be 15% by weight of the total Asphalt-Rubber binder.

- i. The reclaimed vulcanized rubber shall be produced primarily from the processing of automobile and truck tires. The rubber shall be produced by the ambient temperature grinding processes only.

- ii. The specific gravity of reclaimed vulcanized ground rubber shall be not less than 1.10 and not greater than 1.20.

- iii. Rubber for use in Asphalt-Rubber binder shall be free of loose fabric, wire and other contaminants. Up to 4 percent (by weight of rubber) calcium carbonate or talc may be added to prevent caking or sticking of the particles together. The ground rubber shall be sufficiently dry so as to be free flowing and not produce foaming when blended with the hot PG binder.

- Mixing and Reaction Equipment: The method and equipment for combining the ground rubber and PG asphalt binder shall be so designed and accessible that the Engineer can readily determine the percentage of each material being incorporated into the mixture.

- Equipment utilized in the production and proportioning of Asphalt-Rubber binder shall include the following as a minimum:

- i. An asphalt heating tank or heat exchanger with hot oil heat transfer to heat the PG asphalt binder to the necessary temperature before blending with the ground rubber. This unit shall be equipped with a thermostatic heat control device.

- ii. A mechanical blender shall be utilized for proper proportioning and thorough mixing of the PG asphalt binder and ground rubber. This unit shall have a Coriolis type mass flow meter capable of measuring and recording the flow rate and total quantity of asphalt binder in both gallons and weight.

The quantity of ground rubber shall be determined by weight utilizing either a hopper equipped with load cells or a feeder equipped with a belt scale. The percentage of ground rubber based on total asphalt rubber binder shall be recorded.

- iii. An asphalt rubber storage tank equipped with a heating system to maintain the proper temperature of the binder and an internal mixing unit capable of maintaining a homogeneous mixture of asphalt and ground rubber.
- Mixing: The temperature of the asphalt binder shall be between 325°F and 400°F at the time of addition of the ground rubber or per manufacturer recommendations. Ensure that there are no agglomerations of rubber particles in excess of two inches in the least dimension in the mixing chamber.
- The Contractor shall document that the proportions are accurate and that the rubber has been uniformly incorporated into the mixture. Ensure that the crumb rubber and asphalt binder are thoroughly mixed. Rubber floating on the surface or agglomerations of rubber particles is evidence of insufficient mixing. Maintain the temperature of the asphalt-rubber binder immediately after mixing between 325°F and 375°F for a minimum of 45 minutes before use or per manufacturer recommendations.
- Testing and Certification: The materials shall be tested and certified by an AMRL accredited laboratory meeting the requirements of ASTM D 6114 type II specifications.
- The Contractor shall submit with the bid a Quality Control Plan from the Asphalt Rubber supplier meeting the requirements of AASHTO R-26 format.

2.3 Coarse Aggregate

2.3.1 Aggregates shall be of uniform quality durable pebbles or fragments of rock, with or without sand or other inert finely divided mineral aggregate. All material shall be free from clay balls, organic matter, deleterious substances, and an excess of flat or elongated pieces as specified in ASTM D 4791.

2.3.2 In order to obtain uniformity in the appearance of the pavement throughout the project, the aggregate for all surface treatment shall be obtained from the same material source. Sufficient material shall be on hand prior to starting daily operations to insure uninterrupted processing for the working day.

2.3.3 Coarse aggregate shall be crushed stone and a single size shall be nominal 3/8" (9.5 mm) or 1/2" (12.5 mm) meeting the requirements listed in the Table 415-2 -Coarse Aggregate Properties.

Table 415-2 - Coarse Aggregate Properties

Property	Test Method	Value
LA Abrasion Value, % loss	AASHTO T96-94	30 max
Soundness, % loss Magnesium Sulfate or Sodium Sulfate	AASHTO T104-94	18 max 12 max
Flat and Elongated Ratio, % @ 5:1	ASTM D-4791	10 max
% Crushed, single face	ASTM D-5821	95 min
% Crushed, two or more crushed faces	ASTM D-5821	85 min
Cleanliness (% passing 0.60 mm, (#30))	ASTM D-142	2 max
Resistance to stripping*	ASTM D-3625	85 min

*Anti-Stripping agents may be required to provide resistance to stripping, typically 1%.

2.4 Fine Aggregate. The fine aggregate shall be 100% crushed and have a minimum sand equivalent of 50, (AASHTO T 176-86). Fine aggregate shall be free from clay balls and deleterious amounts of organic matter. Stone screening shall be produced from stone at least equal in quality to that specified for coarse aggregate.

2.5 Recycled Materials. Recycled Asphalt Pavement (RAP) or other recycled products shall not be used as aggregate unless approved by the Engineer.

2.6 Mineral Filler. Mineral filler shall conform to AASHTO M 17 Section 2. Hydrated lime, fly ash, bag house fines and cement are acceptable as mineral filler.

2.7 Bond Coat. Grade CRS-1P polymer modified asphalt emulsion meeting the requirements of AASHTO T208 except as modified in table 415-3. If latex is used, it is required that it be co-milled at the bulk emulsion facility, to ensure complete and balanced blending.

Table 415-3 - Bond Coat Properties

Property	Test Method	Min	Max
Elastic Recovery, 25°C	AASHTO T301	65	
Residue by Distillation, %	AASHTO T59	63	
Penetration of Residue, 25°C, 100g, 5 sec	AASHTO T49	60	150

Equipment

3.1 Equipment used by the Contractor shall include, but not be limited to the following:

3.1.1 Paver. The self-priming paver must be capable of spraying the bond coat, applying the hot asphalt overlay and smoothing the surface of the mat in one pass, without equipment driving on or disrupting the bond coat, at a rate of 30-100 feet per minute. The self-priming paver must incorporate

a receiving hopper, feed conveyor, insulated storage tank for emulsion, metered tack coat spray bar and a variable width, heated, ironing type screed. The screed must have the ability to be crowned at the center both positively and negatively and have vertically adjustable extensions to accommodate the desired pavement profile.

3.1.2 Roller. Steel wheeled double drum rollers weighing at least ten (10) tons that are equipped with functioning water systems and scrapers to prevent the fresh mix from adhering to the roller drums.

3.1.3 Milling. Micro milling machine to remove raised pavement markings and provide transitions at intersecting streets, driveways, and at gutter line catch basins.

3.1.4 Sweeper. A regenerative air sweeper equipped with a equipped with metal or nylon rotary broom.

Construction Methods

4.1 Pre-paving Meeting and Control Strip.

4.1.1 The Contractor and all subcontractors shall be available for a pre-paving meeting a minimum of seven days prior to construction activities to discuss the plan. At the meeting, the Contractor shall provide a Job Mix Formula (JMF) of the intended mixes, submittals of the intended crack seal and bonding agent, along with a Quality Control Plan (QCP). The submittals shall be approved by the Engineer prior to construction activities. The QCP shall provide information including but not limited to the following: Materials; Production Facility; Placement Equipment; Production and Field Personnel; Installation Plan; Quality Control Activities; and Traffic Control.

4.1.2 A Control strip will be required to ensure that the Engineer is satisfied with the installation quality including material properties and surface texture. The Control Strip may be a full day's production or a minimum of 1000 feet and must include a minimum of one (1) longitudinal joint. The material shall be installed in a similar location, with similar personnel, and similar equipment. If the materials, labor, or equipment change a new control strip will be required. A Control strip will be required for each BWC material size and binder type placed.

4.2 Surface Preparation

4.2.1 All surface preparations shall be completed by the Contractor prior to applying the wearing course. Manhole covers, water boxes, catch basins and other such utility structures shall be covered with plastic or building felt. Reference each for location and adjustment after paving.

4.2.2 Transitions at intersections, driveways and gutter line catch basins shall be transition milled to provide a smooth transition from the BWC to existing

adjacent pavements. Along curbing where there are no catch basins (i.e. median islands) no transition milling will be required. All rutting observed along the project, primarily at signalized intersections which have rutting over 1/2" (measured crest to trough) in depth will be micro milled prior to BWC installation.

4.2.3 Micro mill or remove all raised (thermoplastic) traffic markings. Temporary Markings shall be installed according to Section 711 - Temporary Preformed Retro reflective Pavement Marking Tape and shall be removed by the Contractor immediately prior to BWC installation.

4.2.4 Clean all cracks and joints greater than 1/4 inch wide by routing and providing a slightly concave shape with material approved by the Engineer. Cracks greater than 3/4 inch shall be crack sealed but not routed. Crack sealing shall be performed in conformance with Section 413 – Hot-Poured Crack Sealant and is incidental to this Section. No over banding will be permitted. The Crack Sealant shall provide not less than 5% polyester reinforcing fibers (PG + fibers), or a polymer and crumb rubber modified asphalt cement including not less than 3% polymers, 7% recycled tire crumb rubber (80 mesh), and 8% polyester fibers (PCRM + fibers).

4.2.5 Damaged traffic signal loops shall be installed prior to the BWC installation.

4.2.6 All surface irregularities greater than 1" deep shall be filled with material approved by the Engineer. Rutting over 1/2" (measured crest to trough) in depth may be removed by micro milling the area.

4.2.7 A regenerative air sweeper shall be utilized to thoroughly clean the entire area to be overlaid and provide both water blasting and vacuum capabilities. This should be done after the joints have been sealed.

4.2.8 The surface at time of BWC installation shall have no free moisture present or ponding water.

4.3 Weather Limitations. The minimum pavement surface temperature for application of the bond coat and placement of the wearing course is 50°F in the shade, although it is recommended that the surface temperature be above 60°F. No freezing conditions are allowed in the first 24 hours, as the emulsion-based tack coat requires about one day to fully cure. Additionally, if the water in the emulsion freezes, it may rupture the bond between the pavement and the new mix.

4.4 Bond Coat Application

4.4.1 Apply the bond coat at a temperature of 120° - 170° F or at manufacturer recommendations. Provide a uniform application across the entire width to be overlaid, at a rate of 0.15 - 0.25 gallons per square yard. The rate of spray shall be continuously monitored. The applicator truck shall be capable of providing digital outputs and a control strip shall be performed during the first day to ensure that the readout is accurate. The spray bar shall be calibrated and able to be adjusted to within $\pm 10\%$ of the design application rate. Coverage of the pavement must be even and uniform and, as such, it is important that there are no plugged nozzles on the spray bar. If the screed extension is outside the spray bar width, the tack coat will need to be applied manually to coat the pavement between the end of the spray bar and the end of the screed. Care should be taken to ensure the correct application rate in such circumstances.

4.4.2 No equipment shall come in contact with the bond coat before the hot mix asphalt concrete wearing course is applied.

4.4.3 Immediately after applying the bond coat, the hot mix asphalt overlay shall be applied across the full width of the bond coat at a temperature of 285° - 325°F or per manufacturer recommendations.

4.5 Paving

4.5.1 Good paving practice should always be followed when constructing a BWC. A BWC may be placed in lifts from 1/2 to 1-1/2 inches thick when using a 3/8 in (9.5 mm) mix. Thicker lifts are allowed when using a 1/2 in (12.5 mm) mix. The spread rate associated with using a 3/8 inch mix is from 7 to 9.5 lb/ft² and 9 to 11 lb/ft² when applying a 1/2 inch mix. The minimum delivery temperature for a BWC is 275°F with an upper temperature limit of 350°F or per manufacturer recommendations.

4.5.2 Longitudinal joints shall be straight or correctly aligned to the curvature of the roadway, and shall occur only at the edge or center of a traffic lane and never in the wheel paths. At the start and finish of the work as well as at intersecting paved sections, the existing flexible pavement should be cut out to a depth of 1 inch and tapered back a distance of 7.5 feet to provide a key for the new surfacing. At the end of the day, the BWC shall be squared off at the point where feathering commences, and the feathered material should be milled out before the next run is started.

4.6 Compacting

4.6.1 Compaction shall be begin immediately after the application of wearing course with two (2) passes of the roller to ensure proper seating of aggregates and to provide a smooth surface. Roller(s) will not be allowed to stop on the freshly placed wearing course. An adequate number of rollers shall be supplied to

complete compaction before the internal pavement temperature falls below 185°F. There are no in place density requirements when rolling BWC mixes.

4.6.2 If necessary, more than two (2) coverages may be ordered by the Engineer when rolling BWC patches or joints.

4.7 Opening to Traffic. Protect the wearing course from traffic until the rolling operation is complete and the material has cooled sufficiently to resist damage, typically 155°F. Typically, no post sweeping is required unless the mix begins to ravel.

Method of Measurement

5.1 Bonded Wear Course (BWC) placed shall be measured by the square yard to the nearest 0.1 of a square yard.

Basis of Payment

6.1 Accepted quantities of Bonded Wear Course (BWC) will be paid for at the contract unit price per square yard, complete in place including milling, sweeping, placement and clean up.

6.2 Pavement patching, crack sealing, structure adjustment or structure repair prior to the BWC installation will be paid for under the appropriate Sections or be performed by others.

6.3 Milling of bituminous surfaces for the installation of the BWC shall be subsidiary.

6.4 Sweeping of surfaces shall be subsidiary.

6.5 Traffic Control will be paid for under Section 619

6.6 Traffic signal loops damaged by the Contractor's negligence or carelessness shall be replaced at no additional cost the City.

6.7 Line striping shall be installed paid for under Section 632 – Reflectorized Pavement Markings or installed by others.

Pay Items and Units:

415.10	Conventional Bonded Wearing Course (BWC)	SY
415.20	Polymer Modified Bonded Wearing Course (BWC-P)	SY
415.30	Asphalt Rubber Bonded Wearing Course (BWC-AR)	SY

SUPPLEMENTAL SPECIFICATION

SECTION 416 – CHIP SEAL

Description

1.1 This work shall consist of preparing and applying an emulsified liquid asphalt and cover aggregate on designated City streets. The intention of the treatment is to seal fine cracks in the pavements surface and prevent water intrusion.

Materials

2.1 Emulsified Liquid Asphalt. Acceptable grades shall be: CRS-2 or RS-2 conforming to AASHTO specifications M208 or M140. The liquid asphalt shall be compatible with the cover aggregate to be used.

2.2 Cover Aggregate. Aggregate used shall be crushed stone, free from dust, soft stone or other contaminants, with a minimum of 90% of the stones have a fractured face. All stone shall satisfy a 35% maximum for the L.A. Abrasion Test and a 35% maximum for the Flakiness Index Test. Aggregate shall meet the following gradation as tested by AASHTO T27.

**Table 416-1
Cover Stone Gradation**

Sieve Size	% Passing
1/2"	100
3/8"	85-100
#4	0-30
#8	0-6
#200	0-2

2.2.1 Pre-treatment of the stone is required if the percentage passing of #200 seive is greater than 1.0%. Proper pre-treatment shall be obtained by a twin shafted Pugmill with a Digital Readout Belt Scale. The stone shall be treated with a diluted slow setting emulsion at the rate of 1 – 2 gallons per ton to ensure uniform treatment of all aggregate.

Engineering Design

3.1 The Contractor shall submit to the Engineer design of the chip seal to be used to meet existing field conditions. The information submitted shall include material specifications, any laboratory test of the material, aggregate gradation tests along with design specific information such as proposed application rates of the emulsified asphalt and cover aggregate material quantities to meet. Variations in material quantities will be

made without adjustment to contract unit price. The Contractor must maintain a laboratory open to the inspection by the Engineer.

3.2 Once the materials are approved, no substitution will be permitted unless first tested and approved by the Engineer.

Equipment

4.1 General. The equipment used by the Contractor shall be maintained in satisfactory working condition at all times to ensure a high quality product

4.2 Asphalt Distributor. The asphalt distributor shall contain suitable mechanical circulating and heating mechanisms to provide a uniform approved temperature of the entire mass of material. The distributor shall be equipped with a radar type sensor used to measure ground speed, and feed a Digital Volumetric Accumulator capable of measuring liters applied and distance traveled. It shall be capable of applying asphalt material in accurately measured quantities at any rate between 0.1 to 2.0 gallons per square yard, of roadway surface, at any length of spray bar up to 16 feet. The distributor shall be capable of maintaining a uniform rate of distribution of asphalt material regardless of change in grade, width or direction of the road. It shall be equipped with an electronic control for setting asphalt pump discharge rate and on/off switching of spray for nozzles in one (1) foot, increments which shall be located in the truck cab. The spray nozzles and pressure system shall provide a sufficient and uniform fan-shaped spray of asphalt material throughout the entire length of the spray bar at all times while operating. The spray shall completely cover the roadway surface receiving the treatment.

4.3 Aggregate Spreader. The aggregate spreader shall be hydrostatically driven and self-propelled. It shall be equipped with a hydraulically controlled variable adjustable head that is capable of spreading stone in widths from 4.5 to 18 feet. The spreader shall be mounted on pneumatic tires and shall apply the treated stone on the road surface in a manner that ensures that the tires do not contact the road surface until after the stone has been applied. The unit shall be equipped with an electronic radar type sensor used to measure ground speed and will automatically adjust the stone application rate depending on width of application and the speed of chip spreader. It shall have the ability to apply stone on any grade from 0 - 6%. The spreader shall be equipped with an integral hopper with a minimum capacity of 5 tons, of treated stone which shall be filled by trucks in a manner which ensures that the truck tires never come in contact with asphalt-treated road surfaces until the stone has been properly applied. To maintain constant stone application, a self-locking truck hitch will permit towing of aggregate trucks without stopping the chip spreader. It will be capable of maintaining positive engagement over irregular terrain.

4.4 Rollers. A minimum of two (2) pneumatic tire rollers shall be used on each treated surface immediately after the stone has been applied. Each roller shall have a compacting width of not less than 5 feet and a gross weight of not less than 8 tons.

4.5 Trucks. Rear discharge conveyor-fed trucks in sufficient number and size must be used to deliver aggregate to the spreader.

Construction Requirements

5.1 Surface Preparation

5.1.1 All surface preparations include any necessary patching and adjusting of drainage and utility structures shall be completed prior to the chip seal treatment.

5.1.2 All cracks and joints greater than 1/4 inch wide shall be cleaned and sealed by routing and providing a slightly concave shape with material approved by the Engineer. Cracks greater than 3/4 inch shall be crack sealed but not routed. Crack sealing shall be performed in conformance with Section 413 – Hot-Poured Crack Sealant and is incidental to this Section. No over banding will be permitted. The Crack Sealant shall provide not less than 5% polyester reinforcing fibers (PG + fibers), or a polymer and crumb rubber modified asphalt cement including not less than 3% polymers, 7% recycled tire crumb rubber (80 mesh), and 8% polyester fibers (PCRM + fibers).

5.1.3 All patch areas, ruts and other surface irregularities 1/2" or greater will be repaired by the Owner prior to placement.

5.1.4 Immediately prior to surface treatment, the roadways shall be thoroughly clean by use of a mechanical sweeper. The Contractor shall protect any manhole covers, drop inlets, catch basins, curbs, and any other structures that will be affected by the surface treatment application.

5.1.5 The surface shall have no free moisture present or ponding water.

5.2 Weather Limitations. The minimum ambient air temperature for application of the placement of the chip seal or microsurface layers shall be 50°F. No freezing conditions are allowed in the first 24 hours. No work shall be done during rainy conditions.

5.3 Material Application

5.3.1 Application rates of the emulsified asphalt of the type specified shall be applied at the contractor's determined rate.

5.3.2 Contractor shall ensure that the asphalt material is not applied more than 300 feet in advance of the aggregate spreader.

5.3.3 Cover aggregate shall be spread from the aggregate spreader at the predetermined application rate.

5.4 Rolling. Initial rolling shall be done immediately following the application of aggregate. A minimum of three (3) passes should be completed over the entire treated area. Rollers shall be operated at a speed not to exceed 5 mph.

5.5 Traffic Control. The roadway shall be kept open to traffic at all times, with traffic discontinued on the lane being treated. Controlled traffic may be permitted as soon as the final layer is applied and rolled.

5.6 Surplus Aggregate. Surplus aggregate shall be swept off of the road surfaces after the emulsified asphalt has properly cured. Care will be taken not to dislodge imbedded aggregate or damage the surface.

Method of Measurement

6.1 Chip Seal placed shall be measured by the square yard of road treated. Measurements shall be to the nearest 0.1 of a square yard.

Basis of Payment

7.1 Accepted quantities of Chip Seal will be paid for at the contract unit price per square yard, complete in place.

7.2 Pavement patching, crack sealing, structure adjustment or structure repair (if required) prior installation will be paid for under the appropriate Sections or be performed by others.

7.3 Work associated with wheel path rut filling prior to installation shall be performed by others.

7.4 Sweeping of surfaces shall be performed by others.

7.5 Traffic Control will be paid for under Section 619

7.6 Line striping shall be installed and paid for under Section 632 – ReflectORIZED Pavement Markings

Pay Items and Units:

416.1	Chip Seal Treatment	SY
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SUPPLEMENTAL SPECIFICATION

Replace Section 632 - Reflectorized Pavement Markings in Standard Specifications with:

SECTION 632 -- REFLECTORIZED PAVEMENT MARKINGS

Description

1.1. This work shall consist of furnishing and placing white or yellow reflectorized paint pavement markings, preformed retroreflective pavement markings, reflectorized thermoplastic pavement markings, and temporary raised plastic pavement markers at the locations shown on the plans or as directed.

Materials

2.1. Paint shall conform to 708.

2.2. Glass beads for traffic paints shall conform to AASHTO M 247 and shall be Type 1 with moisture resistant coating.

2.3. Permanent Tape. Preformed retroreflective pavement marking tape for extended service life shall conform to ASTM D 4505, Retroreflectivity Level I or II, Adhesive Class 2 or 3, Skid Resistance Level A or B. Level I tape should be used when no external lighting source (i.e. overhead lighting) is present and Level II markings should be used when an external lighting source is present.

2.4. Temporary Tape. Retroreflective preformed pavement marking tape for limited service life shall conform to ASTM D 4592 Type I (Removable) or Type II (Non-removable). Type I tapes should be used in areas that require the tape to be removed in the future and Type II tapes should be used when the required service life of the tape is less than three months and can be left in place due to pavement overlay or other similar activity. Type I and II tapes shall have a minimum skid resistance of 45 BPN.

2.5. Preformed thermoplastic. Preformed thermoplastic material shall be composed of a resin resistant to degradation by motor fuels, lubricants etc. In conjunction with aggregates, pigments, binders, and glass beads which have been factory produced as a finished product. The thermoplastic material shall conform to AASHTO M249 with the exception of the relevant differences due to the material being supplied in a preformed state such as during time and flowability tests.

2.6. Preformed thermoplastic material shall have factory applied surface beads in addition to the intermixed beads at a rate of 10 pounds per 100 square feet of markings. It also shall contain a minimum of thirty percent (30%) intermixed graded glass beads by weight.

2.6.1. The surface, with properly applied and embedded surface beads, shall provide a minimum resistance value of 45 PN when tested according to ASTM E 303.

2.6.2. The material shall be applied at a thickness of 80 mils.

2.7.Extruded Thermoplastic Material

2.7.1. Material shall be homogeneously composed of pigment, filler, resins and glass beads. The pre-mix glass beads shall be uniformly distributed throughout the entire thickness of material. The material, when applied in accordance with the manufacturer's recommended procedures, shall be capable of resisting deformation by traffic. The material shall be tested in accordance with AASHTO T250 requirements.

2.7.2. The binder shall be either alkyd or hydrocarbon conforming to AASHTO M249. The binder shall be either alkyd or hydrocarbon conforming to AASHTO M249.

2.7.3. Binder shall consist of a mixture of synthetic resins, at least one of which is solid at room temperature, and high boiling point plasticizers. At least 1/3 of the binder composition shall be solid maleic-modified glycerol ester resin and shall be no less than 10 percent by weight of the entire material formulation..

2.7.4. Thermoplastic material shall not deteriorate by contact with sodium chloride, calcium chloride or other chemicals used to prevent roadway ice. The material shall also not deteriorate because of the oil content of pavement materials or from oil droppings or other effects of traffic.

2.7.5. Material, when formed into pavement markings, shall be readily renewable by placing an overlay of the same material directly over the old markings. The new material shall bond itself to the old markings in such a manner that no splitting or separation takes place.

2.8. Temporary Raised Plastic Pavement Markers

2.8.1. Markers shall be made from impact-resistant polyurethane plastic.

2.8.2. The marker's approximate dimensions are 4 inch width by 2 inch height. The marker shall two micro-prismatic reflective faces (one on each side). Micro-prismatic reflective faces approximate dimension 1/4 inch x 4 inches.

2.8.3. The base of the marker shall be fitted with a butyl rubber pad with a pressure sensitive adhesive capability of adhering to bituminous asphalt surfaces.

Construction Requirements

3.1. General.

3.1.1. All pavement markings of the type specified shall be applied at the locations shown on the plans or as ordered, and shall be in accordance with the Traffic Manual (MUTCD). Traffic control operations in conjunction with placing markings shall conform to 619 and the Traffic Control Plan.

3.1.2. Longitudinal lines placed on tangent roadway segments shall be straight and true. Longitudinal lines placed on curves shall be continuous smoothly curved lines consistent with roadway alignment. All pavement markings placed shall meet the tolerance limits shown on the plans.

3.1.3. Broken lines shall consist of 15 foot line segments with 25 foot gaps and shall meet the tolerance limits shown on the plans.

3.1.4. Unless otherwise specified, widths of longitudinal markings shall be as follows:

<u>Line Type</u>	<u>Width (inches)</u>
Centerlines	4
Edge Lines	4
Lane Lines	4
Gore Markings	8
Cross Walks*	6
Parking Lines	4
Stop Bars	12

*- cross walk edge lines only, where required. Line widths for “piano key” style crosswalk shall be per detail.

3.1.5. Newly painted markings shall be protected from traffic until the paint is cured. The method of protection shall not constitute a hazard to the traveling public. Damage to any markings as a result of tracking shall be repaired by the Contractor.

3.1.6. For guidance in marking longitudinal lines, the Engineer will establish base line points at 50 foot intervals on curves and 100 foot intervals on tangent sections throughout the length of pavement to be marked under this section. All other markings shall be applied according to the physical pavement layout provided. The Contractor shall provide at least 7 days notice to the Engineer prior to beginning marking operations to allow for layout.

3.1.7. For resurfacing contracts, the Contractor's attention is directed to the special requirements contained in 619.3.3.

3.1.8. All clean up and disposal of solvents, residue, and the like shall be the responsibility of the Contractor and shall be performed in accordance with all applicable federal, state and local regulations.

3.2.Retroreflective Pavement Marking Paint.

3.2.1. All equipment used for highway striping shall be specifically designed and manufactured for that purpose by a company experienced in the design and manufacture of such equipment and approved for use. Equipment used for longitudinal lines shall be mounted on a truck having a minimum gross vehicle weight rating of 14,000 lb with a minimum paint tank capacity of 60 gal, and shall have the capability of placing double lines up to 4 in. in width or single lines up to 12 in. in width in one pass. Each paint tank shall be plainly marked in a prominent place with the maximum filled capacity of the tank. Each tank shall have a mixer or aerator capable of combining and maintaining the ingredients of the paint into a thoroughly mixed and uniform mass. The paint shall be applied with an atomizing or airless spray type striping machine having the water base paint at a temperature of 105 °F maximum in the heat exchanger and 85 – 105 °F at the spray nozzle. Paint shall pass through a screen with a maximum opening of 1/8 in. located before the heat exchanger. A valve accessible for sampling shall be located in the paint feed line between the screen and the heat exchanger. The striping machine shall be equipped with an automatic paint stripe controller having skip-line capability to place broken lines in accordance with 3.1.3. A gauge reading paint temperature shall be mounted and conveniently displayed on the equipment. The equipment shall include a mechanical, glass-bead dispenser mounted not more than 12 in. behind the paint dispenser. All equipment shall be kept in good operating condition..

3.2.2. Immediately before applying the pavement marking paint to the pavement, the Contractor shall insure the surface is dry and entirely free from dirt, sand, grease, oil, or other foreign matter.

3.2.3. The surface temperature of the pavement shall be a minimum of 40 degrees F.

3.2.4. Paint shall be applied to a thickness of 20 mil wet

3.2.5. Glass beads shall be evenly applied through the entire paint thickness at a rate of 8 pounds to each gallon of paint. Glass beads shall be applied by pressurized methods for fast-dry paint and by pressurized or mechanical drop methods for regular-dry paint.

3.2.6. All clean up and disposal of solvents, residue, and the like shall be the responsibility of the Contractor and shall be performed in accordance with all applicable federal, state, and local regulations.

3.3.Preformed Retroreflective Pavement Marking Tape.

3.3.1. Preformed retroreflective pavement marking tape shall be applied at locations shown on the plans by mechanical or manual methods. Mechanical applications shall be suitable for all markings. Manual applications shall normally be used for transverse lines, symbols and legends. The manufacturer shall provide technical assistance for equipment operation and maintenance, and product applications.

3.3.2. Preformed retroreflective pavement marking tape shall be stored and applied as directed by the manufacturer. All markings applied after September 1 of any year shall be applied using the inlay method, unless specifically permitted by the Engineer. Prior to September 1, application by either the inlay or overlay method will be permitted, unless otherwise specified. When the inlay method is specified, or chosen by the Contractor, paving and marking operations shall be coordinated to meet the manufacturer's recommendations.

3.3.2.1. For the inlay method, the pavement markings shall be embedded in the pavement surface with a conventional steel wheel roller. The surface temperature of the pavement shall be within the range specified by the manufacturer and shall not deform or discolor the markings.

3.3.2.2. When applying pavement markings by the overlay method, the pavement surface shall be clean, dry and above the minimum temperature as specified by the manufacturer. The surface shall be broomed clean and all dust shall be removed using compressed air. When required by the manufacturer, a coat of primer/adhesive activator shall be applied.

3.3.3. The Contractor shall provide a copy of the manufacturer's storage and application recommendation to the Engineer upon delivery of the material to the project.

3.3.4. The required quantity of preformed retroreflective pavement marking tape shall be available at the project prior to the start of applicable pavement operations.

3.3.4.1. Material shall be delivered to the project in original containers. Each container shall be clearly marked to indicate the color of the material, a specific description of the contents, and the process batch or lot numbers.

3.3.4.2. Material found to be discolored or damaged in any way or material manufactured more than one year prior to installation shall not be used.

3.4.Retroreflective Thermoplastic Pavement Marking.

3.4.1. Thermoplastic pavement markings shall be applied to the road surface in a molten state by screed/extrusion with a surface application of glass beads.

3.4.1.1. All equipment used to apply thermoplastic pavement markings shall be constructed to provide continuous uniform heating at temperatures exceeding 400° F

during mixing and agitation of the material. Equipment used for longitudinal lines shall be mounted on a truck having a minimum gross vehicle weight of 14,000 lb, and shall have the capability of placing double lines up to 4 inches in width or single lines up to 12 inches in width in one pass. The equipment shall operate so that all mixing and conveying parts, including the line dispensing device, maintains the material at the required plastic temperature. The use of pans, aprons or similar appliances which the dispenser overruns will not be permitted. The thermoplastic material shall be applied by the screed/extrusion method. The striping machine shall be equipped with an automatic stripe controller having skip-line capability to place broken lines in accordance with 3.1.3, and a glass bead dispenser located immediately behind the material dispenser. All equipment shall be kept in good operating condition.

3.4.1.2. A special kettle shall be provided for uniformly melting and heating the thermoplastic material. The kettle shall be equipped with an automatic thermostat control device and material thermometer for positive temperature control and to prevent overheating or underheating of the material. The heating kettle and application equipment shall meet the requirements of the National Fire Underwriters, the National Fire Protection Association and state and local authorities.

3.4.2. Immediately before applying the thermoplastic to the pavement, the Contractor shall insure the surface is dry and entirely free from dirt, sand, grease, oil, or other matter which would prevent effective adhesion of the thermoplastic material to the pavement.

3.4.2.1. When recommended by the manufacturer of the thermoplastic material, a primer/sealer shall be applied to the pavement surface prior to the application of the thermoplastic material. The primer shall be void of solvent and water prior to the thermoplastic application.

3.4.3. Thermoplastic pavement marking materials shall not be applied when air and/or pavement surface temperatures are below 50° F or when the surface of the pavement contains any evidence of moisture.

3.4.4. Thermoplastic material shall be applied to the pavement at a thickness of 125 mils

3.4.5. Glass beads shall be evenly applied to the surface of the completed marking at a rate of 10 pounds per 100 square feet of markings. Glass beads shall be applied by pressurized or mechanical drop methods.

3.4.6. Preformed Thermoplastic. Preformed thermoplastic pavement markings shall be a resilient white thermoplastic product with uniformly distributed glass beads throughout the entire cross sectional area. The markings shall be resistant to the detrimental effects of motor fuels, lubricants, hydraulic fluids etc. The markings can be used for stop lines, legends, symbols, and crosswalks, and shall be capable of being affixed to bituminous concrete pavements by the use of the normal heat of a propane torch.

3.4.6.1. The markings shall be capable of conforming to pavement contours, breaks and faults through the action of traffic at normal pavement temperatures. The markings shall

have resealing characteristics, such that they are capable of fusing with themselves and previously applied thermoplastic when heated with the torch.

3.4.6.2. The marking must be able to be applied on pavement with a surface temperature down to 40 °F without any preheating of the pavement to a specific temperature.

3.5.Obliteration of Pavement Markings.

3.5.1. Pavement marking obliteration shall result in a minimum of pavement scar and shall obliterate all evidence of the existing pavement marking material. Removal may be performed by grinding, sand or water blasting, or other method(s) approved by the Engineer that do not materially damage the pavement surface.

3.5.2. “Painting” over pavement markings with paint, asphalt mixtures or any other material is prohibited.

3.5.3. Removal and disposal of pavement markings including, but not limited to retroreflectorized paint, retroreflective thermoplastic, preformed retroreflective tape and raised pavement markers shall be the responsibility of the Contractor in accordance with all applicable federal, state, and local regulations.

3.6. Temporary Raised Plastic Pavement Markers

3.6.1. Marker used shall be of the same color as the specified permanent marking.

3.6.1.1. Markers shall not be used in lieu of permanent retroreflective pavement markings

3.6.2. Marker shall be installed according to the manufacturer’s recommendations.

3.6.3. Spacing of markers shall be per MUTCD.

Method of Measurement

4.1. Longitudinal reflectorized pavement markings will be measured by the linear foot, on the surface of the markings, for the type and width specified.

4.1.1. Broken lines will be measured including gaps between line segments.

4.2. Pavement arrows and pavement words of the type specified will be measured by the square foot, to the nearest 0.1 of a square foot.

4.3. Railroad crossing and do not block markings of the type specified will be measured by the square foot, to the nearest 0.1 of a square foot

4.3.1. Do not block border shall be paid for by the linear for the width of line specified.

4.3.2. Transverse lines and stop bars associated with railroad crossing symbols shall be paid for by the linear for the width of line specified.

4.4. Repair work ordered under 3.1.5 will not be measured.

4.5. Obliterate pavement marking lines of the type specified will be measured by the linear foot to the nearest foot of length of marking, with no adjustment for width.

4.6. Obliterate pavement marking symbols or words of the type specified will be measured by the square foot, to the nearest 0.1 of a square foot

4.7. Temporary raised plastic pavement markers shall be measured in lump sum. This will include all installation removal and replacement as needed.

4.8. Crosswalk markings will be measured by linear foot of surface markings applied at the widths specified.

Basis of Payment

5.1. The accepted quantities of longitudinal reflectorized pavement markings of the type specified will be paid for at the contract unit price per linear foot complete in place.

5.2. The accepted quantities of pavement arrows, and pavement words, of the type specified will be paid at the contract unit price per square foot, complete in place.

5.3. The accepted quantities of railroad crossing markings, and do not block markings of the type specified will be paid at the contract unit price per square foot, complete in place.

5.4. The accepted quantities of transverse and longitudinal lines associated with railroad crossing markings, and do not block markings of the type specified will be paid for at the contract unit price per linear foot complete in place.

5.5. Additional equipment or labor necessary to apply preformed retroreflective pavement marking tape by the inlay method will be subsidiary.

5.6. The accepted quantities of obliterate pavement marking lines will be paid for at the Contract unit price per linear foot. Payment will not be made for the removal of removable pavement marking tape.

5.7. The accepted quantities of obliterate pavement marking symbols or words of the type specified will be paid for at the Contract unit price per each. Payment will not be made for the removal of removable pavement marking tape.

5.8. No payment will be made for those units of pavement markings which do not conform to the requirements of this section.

5.9. Accepted quantities of temporary raised plastic pavement markers will be paid at the Contract lump sum price, which will constitute full compensation for all installation, removal and replacement of the markers as needed or directed by the Engineer.

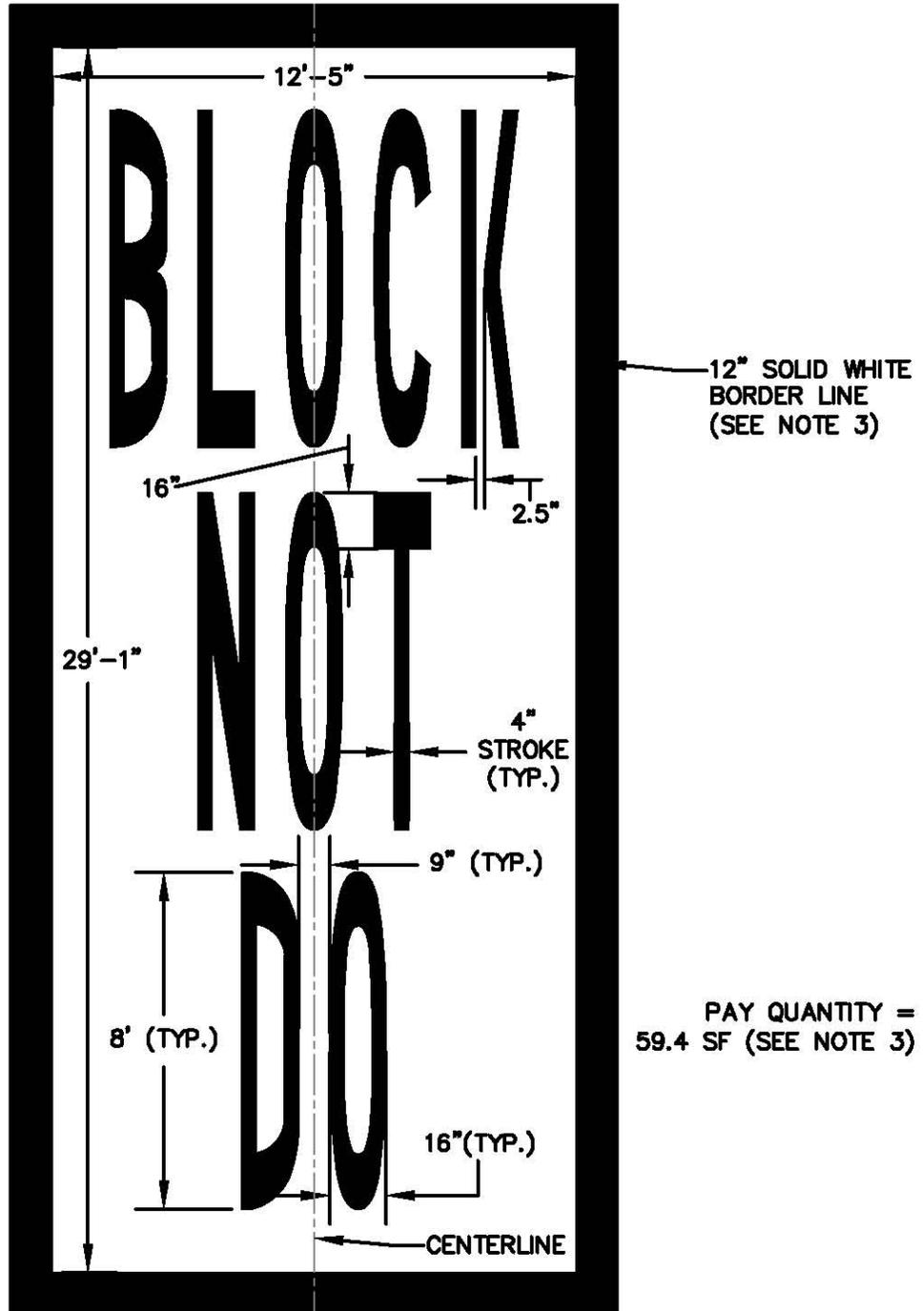
KEY TO ITEM NUMBERS FOR PAVEMENT MARKINGS

Item Number

632. A B C D E	Item number	
632.	Section number	
A	Material	
B	Type of marking	
C D	Width of line	
.A	Material	
.0	Reflectorized Paint	
.1	Preformed Retroreflective Tape, Type I (Removable)	
.2	Preformed Retroreflective Tape, Type II(Non-Removable)	
.3	Retroreflective Thermoplastic	
.8	Temporary Raised Plastic Pavement Markers	Lump Sum
.9	Obliterate Pavement Marking	Square Foot
B	Type of Marking	
1	Single Solid Line	
2	Single Broken Line	
3	Double Solid Line	
4	Double Broken Line	
5	Double Line (Solid with Broken)	
6	Arrow, Word or Symbol	Square Foot
C D	Width of line	
0 4	4 Inch Line	Linear Foot
0 6	6 Inch Line	Linear Foot
0 8	8 Inch Line	Linear Foot
1 2	12 Inch Line	Linear Foot
1 8	18 Inch Line	Linear Foot
2 4	24 Inch Line	Linear Foot

Examples:

632.0104	Reflectorized Paint , 4" Solid Line
632.1304	Preformed Retroreflective Tape, Type I, 4" Double Solid Line
632.36	Retroreflective Thermoplastic, Arrow, Word or Symbol
632.8	Temporary Raised Plastic Pavement Markers

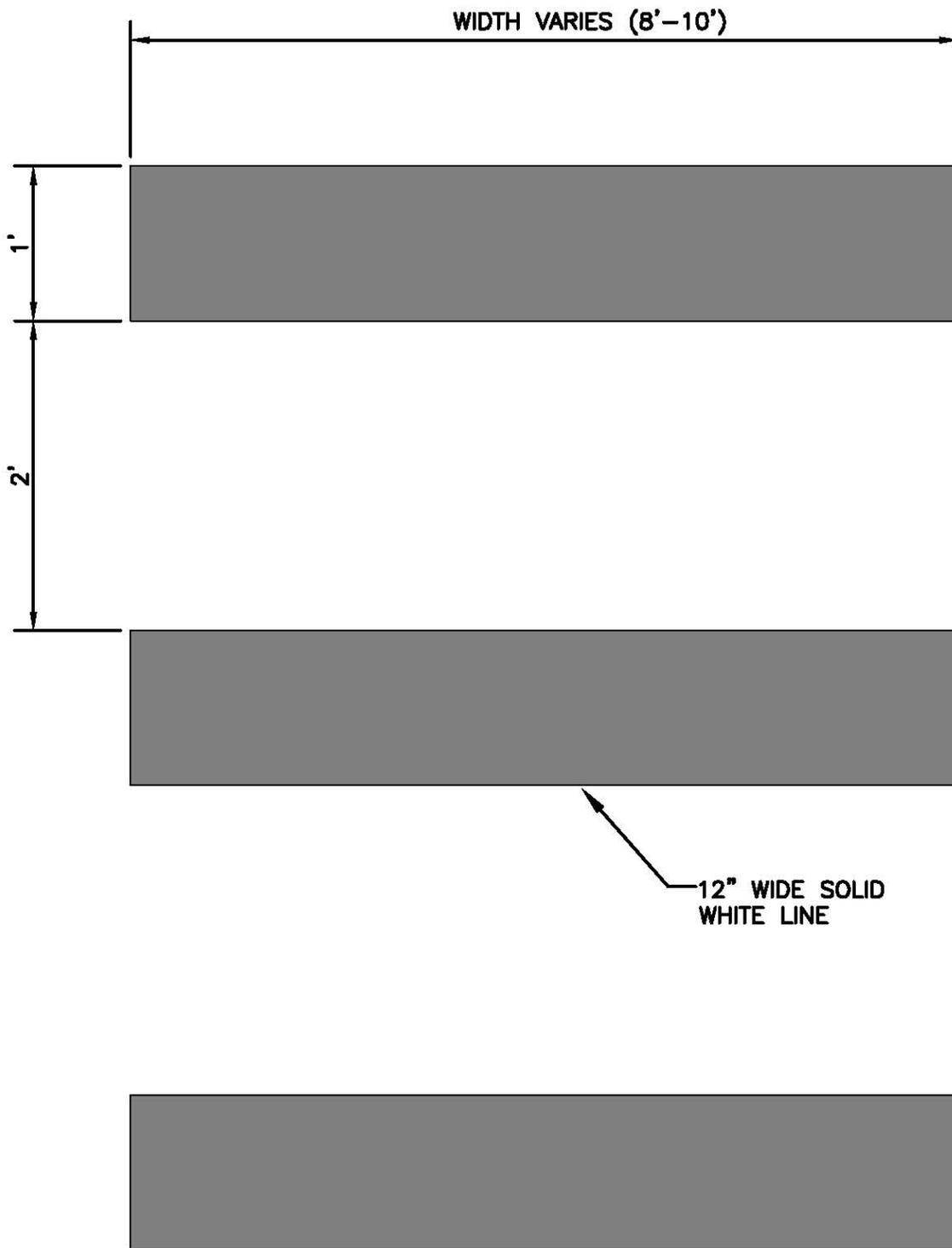


- 1) CENTERLINE OF LETTERING SHALL BE PLACED ON THE CENTERLINE OF LANE OF TRAVEL. FOR MULTIPLE LANES, CENTERLINE OF THE COMBINED LANES SHALL BE USED.
- 2) PAINT USED SHALL BE WHITE THERMOPLASTIC.
- 3) PAY QUANTITY FOR LETTERS ONLY, 12 INCH BORDER LINES WILL BE PAID FOR BY LINEAR FOOT (87.0 LF).

"DO NOT BLOCK" INTERSECTION DETAIL

NOT TO SCALE
FIG. 632-1

S:\DWG\DETAILS\632-1 DO NOT BLOCK.DWG

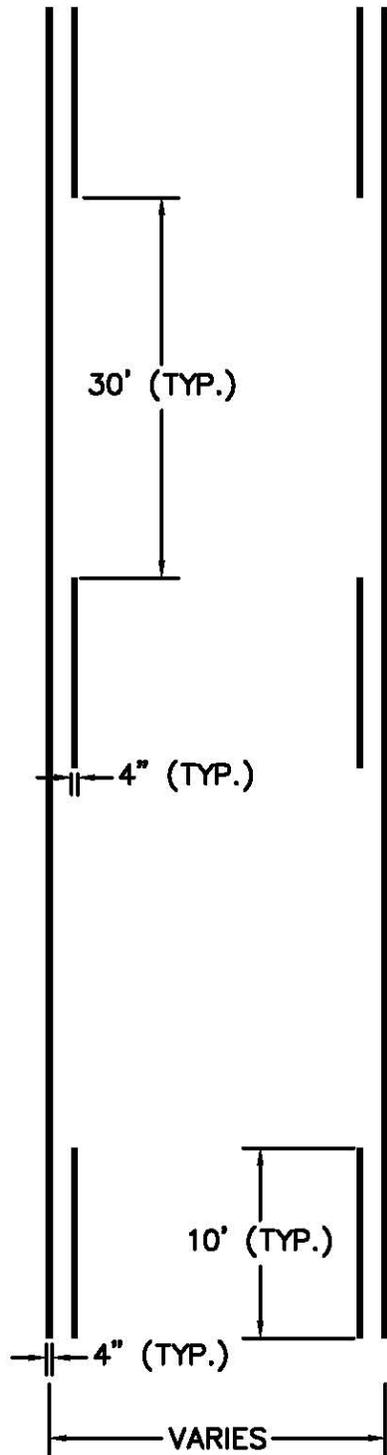


NOTE: ALL MARKINGS TO BE THERMOPLASTIC

TYPICAL CROSSWALK

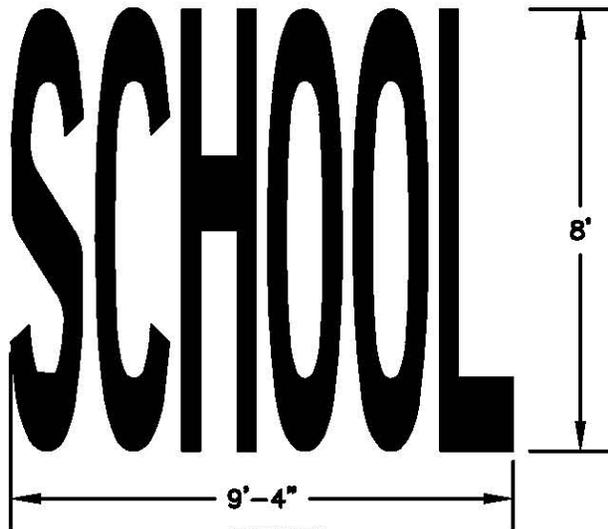
S:\DWG\DETAILS\6.32-1 CROSSWLK.DWG

NOT TO SCALE
FIG. 632-2

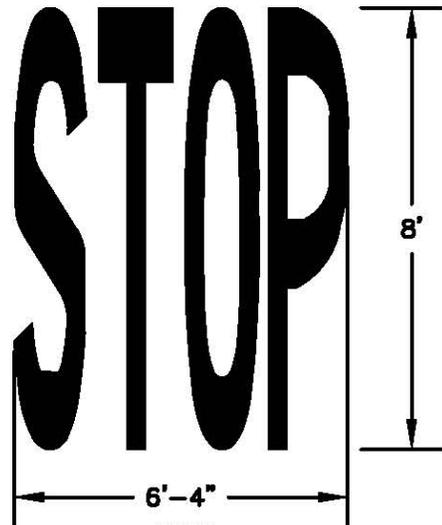


**FIGURE 632-3 DOUBLE LINE
(SOLID WITH BROKEN)**

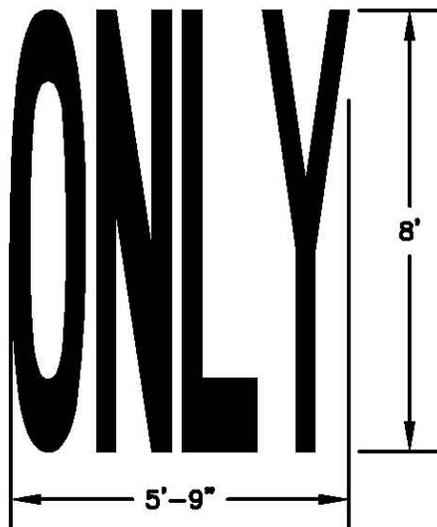
NOT TO SCALE
FIG. 632-3



SCHOOL
PAY QUANTITY = 34.7 SF



STOP
PAY QUANTITY = 22.2 SF



ONLY
PAY QUANTITY = 22.3 SF

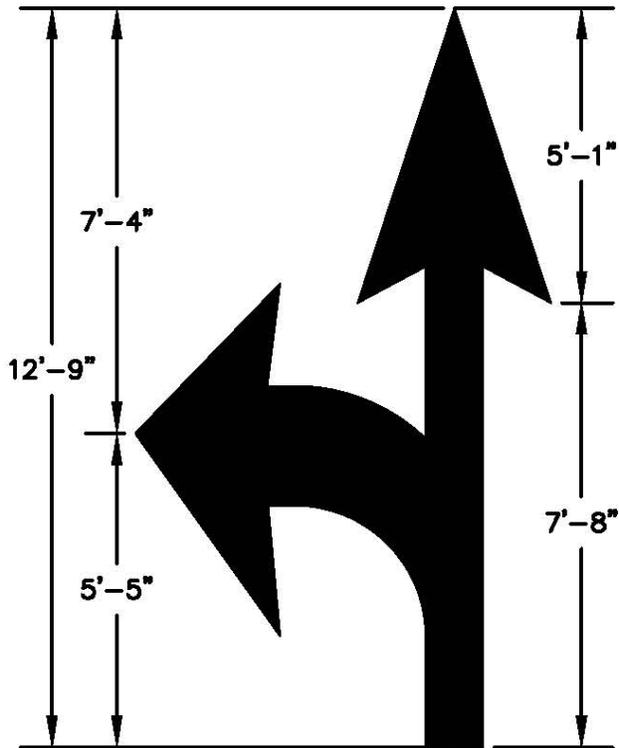
PAY QUANTITIES FOR STANDARD (8FT) LETTERS AND NUMERALS			
A	5.8	S	6.1
B	7.7	T	4.0
C	5.3	U	6.6
D	6.8	V	5.0
E	6.3	W	7.0
F	5.0	X	4.3
G	6.3	Y	4.2
H	6.6	Z	5.7
I	2.0	1	2.0
J	3.9	2	5.8
K	6.4	3	5.8
L	4.1	4	5.1
M	9.0	5	6.4
N	7.7	6	6.8
O	6.3	7	3.8
P	5.8	8	7.0
Q	6.7	9	6.8
R	6.8	0	6.3
		-	0.5

1. WORDS SHALL RETROREFLECTIVE WHITE AND CONFORM TO THE LATEST VERSION OF THE MUTCD
2. MULTI WORD MESSAGES SHALL READ "UP". FIRST WORD SHALL BE NEAREST TO APPROACHING DRIVER
3. THE WORD ONLY SHALL NOT BE USED WITH THROUGH OR COMBINATION ARROWS AND SHALL NOT BE USED ADJACENT TO A BROKEN LANE LINE. A WORD/SYMBOL SHALL PRECEDE THE WORD "ONLY".
4. PREFORMED WORDS SHALL BE CUT BY THE MANUFACTURER. ALL PAINT SHALL BE THERMOPLASTIC

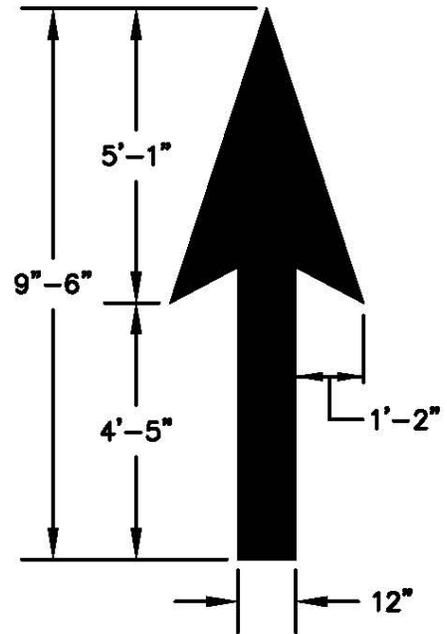
WORD PAVEMENT MARKINGS

S:\DWG\DETAILS\632-4 WORD.DWG

NOT TO SCALE
FIG. 632-4

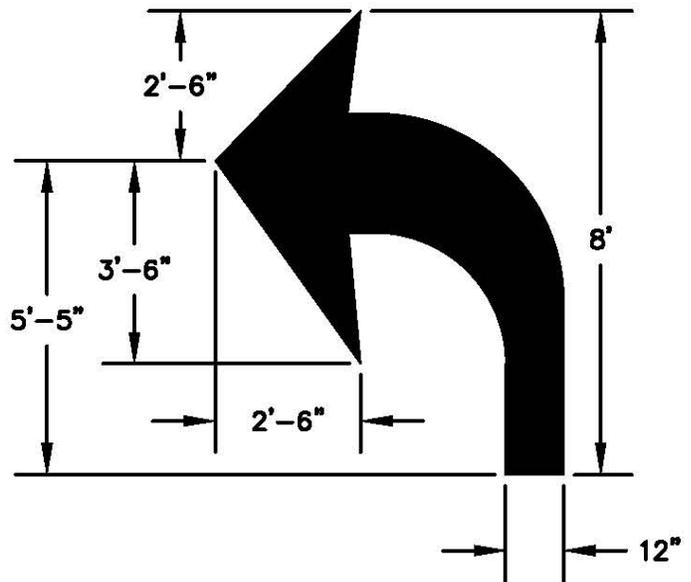


COMBINATION ARROW
PAY QUANTITY = 28.8 SF



THROUGH (STRAIGHT) ARROW
PAY QUANTITY = 12.5 SF

1. ARROWS SHALL RETROREFLECTIVE WHITE AND CONFORM TO THE LATEST VERSION OF THE MUTCD.
2. PREFORMED ARROWS SHALL BE CUT BY THE MANUFACTURER. ALL PAINT SHALL BE THERMOPLASTIC.
3. COMBINATION ARROWS MAY BE COMPRISED OF 2 SINGLE ARROWS (I.E. TURN AND THROUGH) HOWEVER SHAFTS SHALL COINCIDE AS SHOWN.

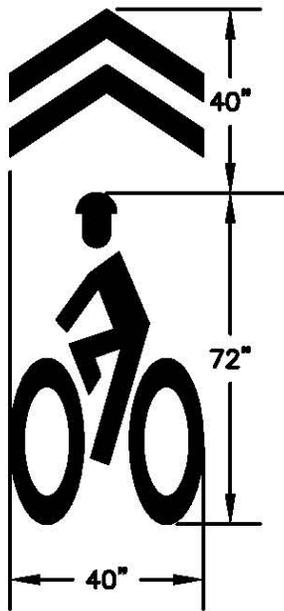


TURN ARROW
(RIGHT TURN OPPOSITE IN KIND)
PAY QUANTITY = 17.0 SF

ARROW PAVEMENT MARKINGS

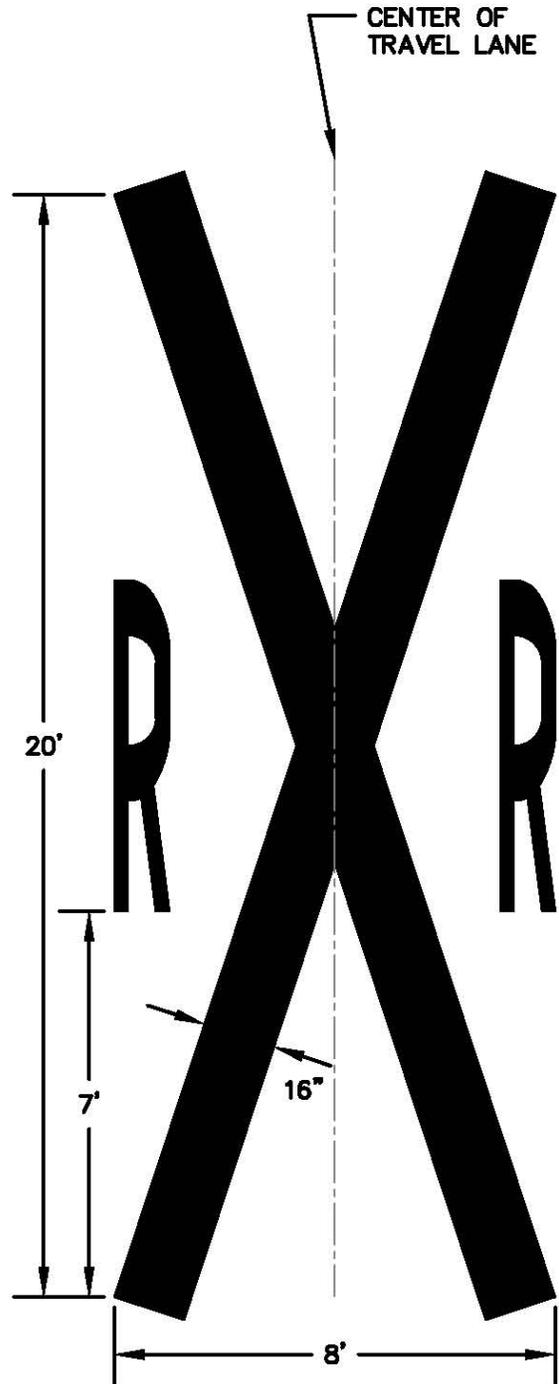
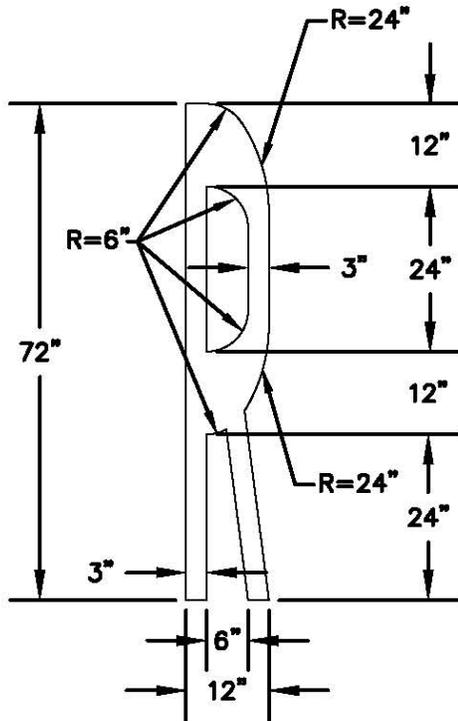
S:\DWG\DETAILS\632-4 ARROW.DWG

NOT TO SCALE
FIG. 632-5



SHARROW SYMBOL
PAY QUANTITY = 3.3 SF

BIKE LANE SYMBOL
PAY QUANTITY = 8.1 SF



RAIL CROSSING SYMBOL
PAY QUANTITY = 63.6 SF

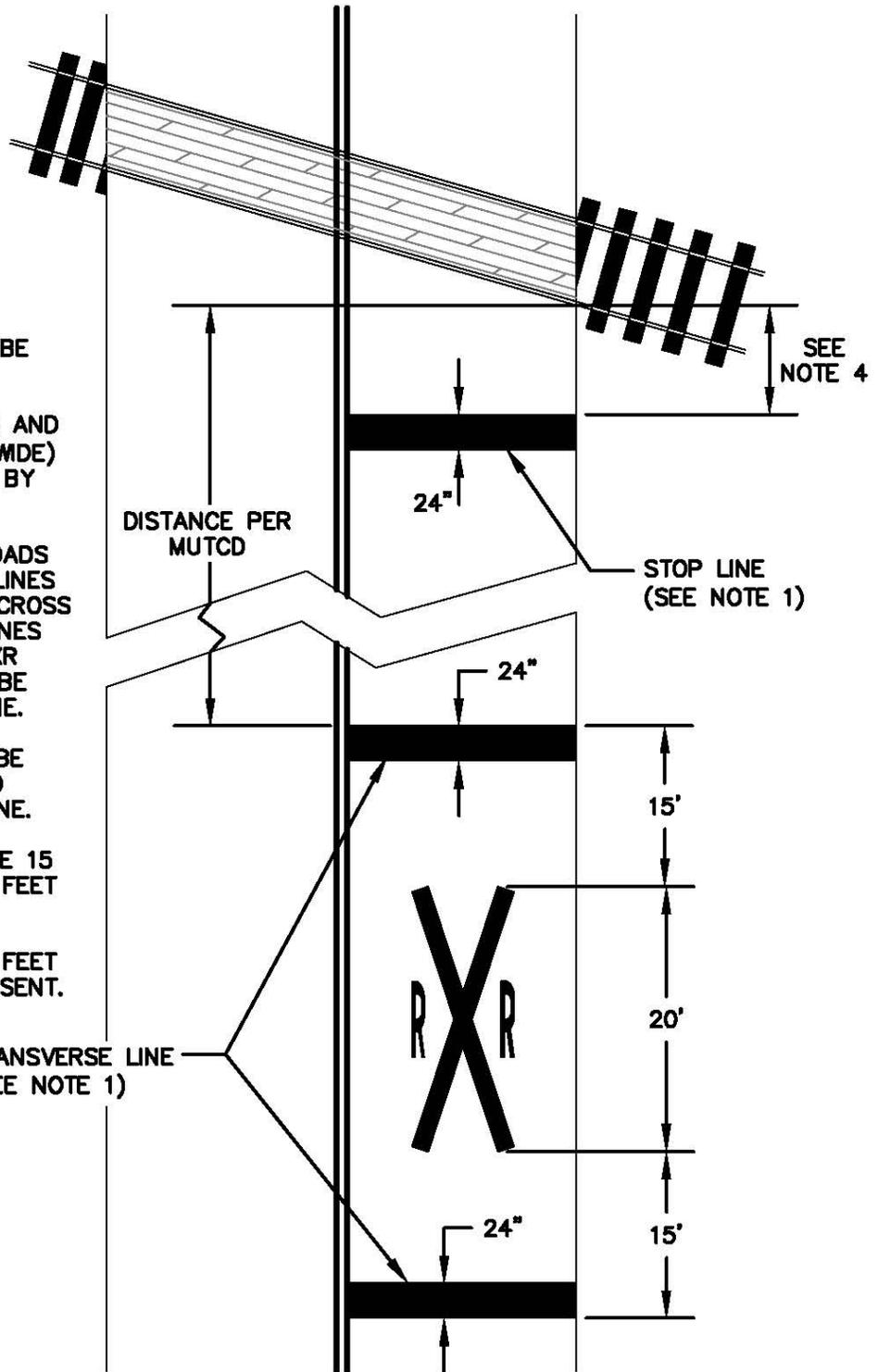
RAIL CROSSING AND BIKE SYMBOL DETAILS

NOT TO SCALE
FIG. 632-6

S:\DWG\DETAILS\632-6 BIKE AND RAIL

1. RXR SYMBOL WILL BE PAID FOR BY THE SQUARE FOOT, TRANSVERSE LINES AND STOP BARS (24" WIDE) WILL BE PAID FOR BY THE LINEAR FOOT.
2. ON MULTI LANE ROADS THE TRANSVERSE LINES SHOULD EXTEND ACROSS ALL APPROACH LANES AND INDIVIDUAL RXR SYMBOLS SHOULD BE USED IN EACH LANE.
3. STOP LINE SHALL BE PERPENDICULAR TO HIGHWAY CENTERLINE.
4. DISTANCE SHALL BE 15 FEET MINIMUM, 20 FEET MAXIMUM FROM NEAREST RAIL, OR APPROXIMATELY 8 FEET FROM GATE IF PRESENT.

TRANSVERSE LINE
(SEE NOTE 1)



AT GRADE RAILROAD MARKING LAYOUT

S:\DWG\DETAILS\632-6 BIRE AND RAIL

NOT TO SCALE
FIG. 632-7

SUPPLEMENTAL SPECIFICATION

SECTION 900 – Street Sweeping

Description

1.1 This work shall consist providing sweeping with equipment with operator to collect, dust, sand and other debris within the work area.

Equipment

2.1 Units used shall be self-contained vehicle mounted units capable of performing the work on the entire work site under its own power. Either mechanical, regenerative air or vacuum type may be selected and shall be agreed upon by the Contractor and based on the specific need at the work site.

2.2 Units provided shall be of the appropriately sized for the work involved

2.3 Units shall have onboard systems to control dust.

2.4 Contractor shall be responsible for providing any water for the sweeper units.

2.5 Units shall be equipped with caution/safety lighting systems and be used at all times within the work area.

2.6 Contractor shall provide means for sweeping unit empty and dispose accumulated tailings in the hopper. All tailings shall be hauled off the work site and disposed of in a proper manner.

2.7 Each sweeper vehicle shall be kept in mechanically safe condition at all times.

Method of Measurement

4.1 Work performed under this Section will be measured by the number of hours each sweeping unit is at the work site.

4.2 Hours measured shall be from the time each unit arrives on site to the time each unit departs, measured to the nearest half hour.

Basis of Payment

5.1 Street sweeping shall be paid at the hourly unit price bid for the time spent by the unit (with operator) at the work site.

5.2 Contractor shall submit documentation showing when unit(s) arrived and departed the work site.

Pay items and units:

900.1	Street Sweeping	HR
-------	-----------------	----

CONTRACT AGREEMENT

THIS AGREEMENT made this ____ th **day of** _____, **2016** by and between the City of Manchester, New Hampshire acting through its Department of Public Works, hereinafter called the party of the first part and _____ their successors and assigns, part of the second part, hereinafter called the Contractor. Witnesseth, that the Contractor, for and in consideration of the payment or payments herein specified and agreed to by the party of the first part, hereby covenants and agrees to furnish and deliver all the materials and to do and perform all the work and labor in the construction of the **BONDED WEARING COURSE TREATMENT -FY17**, hereinafter called the project, in the City of Manchester, County of Hillsborough, State of New Hampshire at the unit prices bid by the said Contractor for the respective estimated quantities, aggregating approximately the sum of: \$ _____, and such other items as are mentioned in the original proposal, which proposal and prices named, together with the General Provisions and Technical Specifications and the Special Provisions accompanying the proposal, and made a part of this Contract and accepted as such, are also agreed by each party as being a part hereof, the said project being situated as follows:

- **Application of bonded wearing course treatment to various City roadways**

The Contractor further covenants and agrees that all of the said materials shall be furnished and delivered and all of said labor shall be done and performed in every respect to the satisfaction and approval of the Department of Public Works aforesaid, within **365 consecutive calendar days** from the date specified in the Notice to Proceed.

The successful Bidder at the time of the execution of the contract, must deposit with the Department of Public Works security in the form of a Performance Bond and a Payment Bond, each in the sum equal to 100 percent of the amount of the contract award. The form of the bonds shall be that provided by the Department and the surety shall be acceptable to the City.

IN WITNESS WHEREOF, the parties of this contract have hereunto set their hands and seals as of the day and year first above written.

CITY OF MANCHESTER
(SEAL)

The Honorable Mayor of the
CITY OF MANCHESTER

By _____
Theodore L. Gatsas

DIRECTOR OF PUBLIC WORKS

By _____
Kevin A Sheppard, P.E.

Signed and sealed in
presence of:

Date

CONTRACTOR
(SEAL)

By: _____

Title: _____

Federal I.D. No. _____

Approved as to form and execution

City Solicitor

NOTARIZATION

Certificate of Acknowledgment of Contractor, if a Corporation

State of New Hampshire,

ss:

County of Hillsborough,

On this _____ day of _____, 2016

before me personally came _____

to me known, who being duly sworn did say as follows:

that he resides at: _____

and is the _____ of _____ the
corporation

described herein and which executed the foregoing instrument; that he knows the corporate seal of said corporation; the seal affixed to the foregoing instrument is such corporate seal and it was so affixed by order of the Board of Directors of said corporation and by the like order, he signed thereto his name and official designation.

Notary Public (seal)

My commission expires: _____

STATEMENT OF UNDERSTANDING

Project Safety

WHEREAS this project is subject to all Safety and Health Regulations as promulgated by the U.S. Department of labor, it shall be a requirement that the Contractor designate a "Safety Officer" who's duty shall be to monitor the project on a daily basis in order to insure that all safety measures alluded to in the contract and otherwise pertinent to this project, are strictly adhered to. Special attention shall be paid to maintaining existing guide, regulatory and warning signs affecting the movement of traffic.

IT IS hereby agreed that responsibility for the above mentioned safety measures is solely that of the Contractor has been designated as the project "Safety Officer".

Date: _____, 2016

By:

Title:

STATEMENT OF COMPLIANCE
Drug Testing Program

WHEREAS this project is subject to federal laws, rules and regulations, and WHEREAS all drivers of commercial vehicles over 26,000 pounds GVWR are required to have a Commercial Drivers License (CDL), it is hereby certified that the Alcohol and Drug Testing requirements for Commercial Motor Vehicle Drivers mandated by the Federal Highway Administration, United States Department of Transportation are being complied with.

Date: _____, **2016**

By:

Title:

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That we _____
_____ a _____ hereinafter
called the "Principal" and _____ of _____, State
of _____ hereinafter called the "Surety", are held and firmly
bound

unto THE CITY OF MANCHESTER, NEW HAMPSHIRE, hereinafter called "Owner",
in the penal sum of (_____) in lawful money of the United
States, for the payment of which sum well and truly to be made, we bind ourselves, our
heirs, executors, administrators and successors, jointly and severally, firmly by these
presents.

THE CONDITIONS OF THIS OBLIGATION is such that WHEREAS, the Principal
enter into a certain contract with the Owner, dated the (Date) copy of which is hereto
attached and made a part of hereof for the construction of:

" BONDED WEARING COURSE TREATMENT -FY17" in accordance with
drawings and specifications prepared by the City of Manchester, N.H. which contract is
by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties,
all the undertakings, covenants, terms, conditions and agreements of said contract during
the original term thereof, and any extensions thereof which may be granted by the
Owner, with or without notice to the Surety, and if he shall satisfy all claims and
demands incurred under such contract, and shall fully indemnify and save harmless the
Owner from all costs and damages which it may suffer by reason of failure to do so, and
shall fully reimburse and repay the Owner for all outlay and expense which Owner may
incur in making good any default, then this obligation shall be void; otherwise to remain
in full force and effect.

PROVIDED FURTHER, that the said Surety, for value received, hereby stipulates and
agrees that no change, extension of time, alteration or addition to the terms of the
contract or to the work to be performed thereunder, or the specifications accompanying
the same, shall in any way affect its obligation on this bond, and it does hereby waive
notice of any such change, extension of time, alteration or addition to the terms of the
contract or to do the work or to the specifications.

PROVIDED FURTHER, that no final settlement between the Owner and the Contractor
shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in six (6) counterparts, each one of which shall be deemed and original, this the ____ day of _____ 2004.

ATTEST:

Principal

(S)

(Principal)

(Seal) By _____ (S)

(S)

Witness as to Principal

Address

ATTEST:

Surety

(S)

(SURETY) By _____ (s)

Attorney-in-Fact

(SEAL)

(S)

Witness to Surety

(Address)

Address

Note: Date of Bond must not be prior to date of Contract.

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That _____

_____ as Principal, hereinafter called Principal, and _____ as surety, hereinafter called Surety, are held and firmly bound unto THE CITY OF MANCHESTER, NEW HAMPSHIRE, as obligee, hereinafter called Owner, for the use and benefit of claimants as herein below defined, in the amount of (_____) for the payment where of Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement, dated _____, **2016** entered into a contract with Owner for the construction of

" **BONDED WEARING COURSE TREATMENT -FY17**" in accordance with drawings and specifications prepared by the City of Manchester, N.H. which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the work, provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools consumed or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor, performed in such work, whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED FURTHER, that the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder, or the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to do the work or the specifications.

PROVIDED FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in six (6) counterparts, each one of which shall be deemed and original, this ____ **day of** _____, **2016**.

ATTEST: _____ Principal

_____ (Principal)

(Seal) By _____ (S)

By: _____ Witness as to Principal(s)

_____ Address

_____ Surety

ATTEST: By _____ Attorney-in-Fact(s)

_____ (Surety)

(Seal)

By: _____ (S)

Witness as to Surety

Note: Date of Bond must not be prior to date of Contract.