

2023 CITY ROADWAY IMPROVEMENTS

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RFP 22/23-13
BID PROPOSAL

FOR: 2023 CITY ROADWAY IMPROVEMENTS

CITY OF EAST PROVIDENCE
Office of City Manager
Room 102, City Hall
145 Taunton Avenue
East Providence, RI 02914

The undersigned bidder, being familiar with local conditions affecting the cost of the work, hereby proposes to provide all necessary labor, materials, equipment and incidental items necessary to do all the work called for in the Specifications and in accordance with the Contract Documents.

A pre-bid meeting will be held on April 6, 2023 at City Hall, 145 Taunton Avenue, East Providence, conference Room A at 2 PM. Questions on the bid are due by April 20 and responses to questions will be provided by April 27. Bids are due on Thursday May 11, 2023 at 11 AM.

The undersigned further understands that the quantities of work as shown are approximate only and are subject to increase or decrease and offers to do the work whether the quantities are increased or decreased, at the unit prices stated. Davis-Bacon wages apply to this proposal.

All prices must be written in words and figures. In case of discrepancy, the amount shown in words will govern.

Bidder acknowledges receipt of the following addendum:

At the time of the opening of bids, the bidder shall have inspected the sites of the work to familiarize himself with the conditions relating to the work under the contract.

Bidder hereby agrees to begin work within ten (10) days after the date of the NOTICE TO PROCEED, unless otherwise specified or permitted by the CITY, and shall complete the work under the provisions of the Contract by November 30, 2023. **The City may elect to extend this schedule due to utility work which schedule is beyond the control of the CITY. All bid numbers shall be held firm until November 30, 2023. The city has the right to extend the contract an additional two (2) years if agreed to by the selected Contractor and City.**

The undersigned bidder submits herewith Bid Security in the form of a Bid Bond or a Certified Check, in favor of the City of East Providence, in the amount not less than five (5) percent of the total amount bid in dollars, and agrees

and consents that, if he is the successful bidder, the Bid Security shall be forfeited to the City of East Providence as liquidated damages, if the required Contract and Surety Bond are not executed within ten (10) days from the date of the NOTICE OF AWARD.

LIQUIDATED DAMAGES will be assessed at the rate of \$500.00 per day for each day beyond the contract length herein stipulated.

The undersigned bidder further agrees to pay the premiums for the Surety Bond (Performance, Labor and Materials Payment Bonds) for which said premiums are to be included in the Bid Price.

BIDDING FIRM: _____

NUMBER & STREET: _____

CITY/STATE/ZIP: _____

SIGNATURE: _____

TITLE: _____

DATE: _____

TELEPHONE NO.: _____

Being a Corporation, incorporated under
the laws of the State of

(Partnership)
(Individual)

Composed of officers, partners
or owner as follows:

(President, Owner, Partner)

(Corporate Seal)

RFP 22/23-13
2023 ROADWAY IMPROVEMENTS
BID SHEET

ITEM NO.	EST. QTY.	BRIEF DESCRIPTION WITH UNIT BID PRICE IN WORDS	UNIT BID PRICE IN FIGURES	AMOUNT IN FIGURES
1.a.	11,000 Tons	Furnish and Install 3/8" Bituminous Pavement (Class I-1, Wearing Course)		
		_____ (Per Ton)	\$ _____	\$ _____
1.b.	2,000 Tons	Furnish and Install 3/4" Bituminous Pavement (Binder Course)		
		_____ (Per Ton)	\$ _____	\$ _____
2.a.	12,500 S.Y.	Pavement Reclamation		
		_____ (Per Square Yard)	\$ _____	\$ _____
2.b.	8,000 S.Y.	Fine Grade and Compaction		
		_____ (Per Square Yard)	\$ _____	\$ _____
2.c.	1000 C.Y.	Removal and Delivery Existing Pavement and Earth Materials to the Forbes Street Landfill		
		_____ (Per Cubic Yard)	\$ _____	\$ _____
3.a.	20,000 S.Y.	Cold in Place Recycling Including Fog Seal		
		_____ (Per Square Yard)	\$ _____	\$ _____
3.b.	500 S.Y.	Pre Milling		
		_____ (Per Square Yard)	\$ _____	\$ _____

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BID SHEET

ITEM NO.	EST. QTY.	BRIEF DESCRIPTION WITH UNIT BID PRICE IN WORDS	UNIT BID PRICE IN FIGURES	AMOUNT IN FIGURES
3.c.	2.0 Day	Core Sampling		
		_____	\$ _____	\$ _____
		(Per Day)		
3.d.	3.00 EA.	Mix Designs		
		_____	\$ _____	\$ _____
		(Per Design)		
3.e.	23,000 Gal.	Liquid Asphalt Stabilizing Agent (Foamed Asphalt)		
		_____	\$ _____	\$ _____
		(Per Gallon)		
3.f.	40 Tons	Portland Cement Stabilizing Agent		
		_____	\$ _____	\$ _____
		(Per Ton)		
3.g.	Per hour	Down Time for CIR Only		
		_____	\$ _____	\$ _____
		(Per hour)		
4.	50,000 S.Y.	Cold Planing		
		_____	\$ _____	\$ _____
		(Per Square Yard)		
5a.	400 L.F.	12" Thermoplastic Pavement Markings, White Crosswalks And Stop Bars		
		_____	\$ _____	\$ _____
		(Per Linear Foot)		
5b.	500 L.F.	4" Thermoplastic Pavement Markings, double yellow or fog lines		
		_____	\$ _____	\$ _____
		(Per Linear Foot)		

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ITEM NO.	EST. QTY.	BRIEF DESCRIPTION WITH UNIT BID PRICE IN WORDS	UNIT BID PRICE IN FIGURES	AMOUNT IN FIGURES
6.	10 EACH	Handicap Sidewalk access Ramp		
		_____ (Each)	\$ _____	\$ _____
7.	100 C.Y.	Gravel Borrow		
		_____ (Per Cubic Yard)	\$ _____	\$ _____
8.	Allowance 780 Hours	Police Detail (Traffic Control)		
		Sixty Five Dollars (Per Hour)	\$ 65.00	\$50,700
9.	100 EACH	Gate Box and Small Structure Adjustment and/or Replacement		
		_____ (Each)	\$ _____	\$ _____
10.	1 L.S.	Miscellaneous Work and Clean Up		
		_____ (Lump Sum)	\$ _____	\$ _____
11.	10 EACH	Manhole Frame and Cover/Grate Replacement		
		_____ (Each)	\$ _____	\$ _____
12.	2000 L.F.	Reset Existing Curb, curb returns, transitions, radius stone, curb inlets, etc.		
		_____ (Per Linear Foot)	\$ _____	\$ _____
13.	400 L.F.	Furnish & Install New Granite Curb		
		_____ (Per Linear Foot)	\$ _____	\$ _____

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BID SHEET

ITEM NO.	EST. QTY.	BRIEF DESCRIPTION WITH UNIT BID PRICE IN WORDS	UNIT BID PRICE IN FIGURES	AMOUNT IN FIGURES
14.	100 SY	F & I Concrete Sidewalks (Walkways-4" thickness)		
		_____	\$ _____	\$ _____
		(Per Square Yard)		
15.	25 S.Y.	Furnish and Install Concrete Sidewalks (Driveways-6" thickness)		
		_____	\$ _____	\$ _____
		(Per Square Yard)		
16.	1,000 L.F.	Cutting of Cement Concrete Driveways		
		_____	\$ _____	\$ _____
		(Per Linear Foot)		
17.	100 S.Y.	Removal and Disposal of Cement Concrete Driveways		
		_____	\$ _____	\$ _____
		(Per Square Yard)		
18.	100 S.Y.	Handwork		
		_____	\$ _____	\$ _____
		(Per Square Yard)		
19.	1000 L.F.	Furnish and Install Bituminous Berm		
		_____	\$ _____	\$ _____
		(Per Linear Foot)		

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BID SHEET

ITEM NO.	EST. QTY.	BRIEF DESCRIPTION WITH UNIT BID PRICE IN WORDS	UNIT BID PRICE IN FIGURES	AMOUNT IN FIGURES
20.	2 EACH	F & I Granite Inlet Stone (Ea.Prov. Std. R-33) includes removal and disposal of existing inlet stone.		
		_____	\$ _____	\$ _____
		(Each)		
21.	100 EACH	Adjustments to Manholes and Drainage Structures		
		_____	\$ _____	\$ _____
		(Each)		
22.	50 V.F.	Rebuild Catch Basins or Manholes 0-6 feet		
		_____	\$ _____	\$ _____
		(Per Vertical Foot)		
23.	2 EA.	Replace Traffic Loop		
		_____	\$ _____	\$ _____
		(Each)		
24.	1,400 S.Y.	Variable Width Hot Mix Asphalt Sidewalk		
		_____	\$ _____	\$ _____
		(Per Square Yard)		

BASE BID PRICE FOR ITEMS 1 THROUGH 24 \$ _____
Amount in Figures

Amount in Words

RFP 22/23-13
2023
ROADWAY IMPROVEMENTS
BID SHEET

ITEM NO.	EST. QTY.	BRIEF DESCRIPTION WITH UNIT BID PRICE IN WORDS	UNIT BID PRICE IN FIGURES	AMOUNT IN FIGURES
ADD/ALTERNATE - ITEMS 26- 28				
25a.	400 L.F.	Furnish and Install 12-inch HDPE Water Tight Drain Pipe, up to 8-foot depth		
		_____	\$ _____	\$ _____
		(Linear Foot)		
25b.	50 L.F.	Furnish and Install 15-inch HDPE Water Tight Drain Pipe, up to 8-foot depth		
		_____	\$ _____	\$ _____
		(Linear Foot)		
25c.	50 L.F.	Furnish and Install 18-inch HDPE Water Tight Drain Pipe, up to 8-foot depth		
		_____	\$ _____	\$ _____
		(Linear Foot)		
26.	3 Ea.	Furnish and Install 4-foot Diameter Precast Drainage Manhole with Frame and Cover 8-foot depth		
		_____	\$ _____	\$ _____
		(Each)		
27.	6 Ea.	4-FOOT DIAMETER 3' sump Precast Catch Basins with Frame and Grates, up to 6-foot depth		
		_____	\$ _____	\$ _____
		(Each)		

BASE BID PRICE FOR ITEMS 25 THROUGH 27 \$ _____
Amount in Figures

Amount in Words

2023 CITY ROADWAY IMPROVEMENTS
SUMMARY OF WORK
SECTION 01010

SECTION 01010

SUMMARY OF WORK

PART 1.00 - GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

- A. The work under this Contract includes, but is not limited to the following:
1. Furnish equipment, labor and materials necessary to reclaim the in-place asphalt and underlying materials, fine grade and compact the base as specified and directed.
 2. Furnish equipment, labor and materials necessary to cold plane the in-place asphalt to the depths specified and directed.
 3. Furnish equipment, labor and materials necessary to perform cold in-place recycling of existing asphalt to the depths specified and directed.
 4. Furnish equipment and materials necessary to install bituminous materials to specifications as indicated.
 5. Furnish and install cement concrete and/or hot mix asphalt sidewalks and sidewalk handicap access ramps as directed.
 6. Furnish and install new or re-set existing granite curbing as specified or directed.
 7. Furnish and install pavement markings as specified and directed.
 8. Adjust to final grade all utility boxes, manhole frame & covers, catch basin frame & covers, etc.
 9. Installation of drainage pipe, catch basins and manholes as directed by the City.
 10. Provide and maintain traffic control throughout the entire duration of this work. This includes the contractor being responsible to post no-parking signs and distributing notice of work letters to residents around the area of work, 48 hours prior to commencing work.
 11. Perform miscellaneous work and clean up as required to complete the project as listed in these Contract documents. All streets shall be completed within 14 days of final paving including loam and seed up to 3-feet behind berms, or payment will be withheld.
 12. Attend weekly project status meetings with City Officials to discuss schedule and quantities.
- B. Clean up of the area after construction is considered part of the

work covered under construction pay items. Unsatisfactory clean up shall be grounds for withholding payment for pay items, as directed by the CITY. The Contractor shall finish each road including all clean-up, loam and seed etc., within 14 days after the wearing course is installed.

C. Related Requirements Specified Elsewhere:

1. Temporary Facilities and Controls - Section 01500.

D. Contractor's Duties:

1. Except as specifically noted, provide and pay for:
 - a. Labor, materials and equipment
 - b. Tools, construction equipment and machinery
 - c. Transportation, supervision and temporary construction
 - d. Water, heat and utilities required for construction
 - e. Other facilities and services necessary for proper execution and completion of work
2. CITY is exempt from sales taxes on products permanently incorporated in work.
 - a. Perform all administrative functions required by law in conjunction with use of the CITY's tax exempt blanket certificate.
 - b. Pay legally assessed penalties for improper use of exemption certificate.
3. Secure and pay for, as necessary for proper execution and completion of work, and as applicable at any time of receipt of bids:
 - a. Permits (RICRMC and RIDEM Permits Excluded)
 - b. Government Fees
 - c. Licenses
4. Give required notices and provide the CITY with the DIGSAFE number for work under this contract.
5. Comply with Local, State and Federal codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on performance of work.
6. CONTRACTOR shall be responsible for compliance with all pertinent OSHA regulations.
7. Promptly submit written notice to CITY of observed variance of CONTRACT DOCUMENTS from legal requirements. It is not the CONTRACTOR's responsibility to make certain that drawings and specifications comply with codes and regulations.
 - a. Appropriate Modifications to Contract Documents will

adjust changes.

- b. CONTRACTOR shall assume responsibility for notifying CITY concerning work known to be contrary to such requirements.
8. Enforce strict discipline and good order among employees. Do not employ on work:
- a. Unfit persons
 - b. Persons not skilled in assigned task.
9. No valve or other control on the City's water system shall be operated for any purpose by the CONTRACTOR. The Water Utility Division (435-7741) will operate all valves, hydrants, blow-offs and curb stops.
10. CONTRACTOR shall lay out all the contract work and be responsible for the accuracy of all lines, grades and measurements. The Contractor shall guarantee no ponding or puddling within the completed work zones. Grades shall be certified prior to surface course being laid. Unless otherwise directed by the City Engineer, cross slopes shall not be less than 1.5% nor greater than 3%.
11. CONTRACTOR is responsible for notifying DIGSAFE (1-888-DIGSAFE) in accordance with State law prior to commencing any earthwork activities.
12. CONTRACTOR shall be prepared to attend a pre-construction meeting within ten (10) days after date of Notice to Proceed. The agenda of the pre-construction meeting shall include but not be limited to:
- a. Presentation of project construction schedule and work sequencing
 - b. Project coordination and designation of responsible personnel
 - c. Use of subcontractors
 - d. Emergency telephone numbers
 - e. Procedures and processing of field decisions, submittals, change orders, applications for payment
 - f. Construction facilities, controls and equipment storage
 - g. Safety and traffic issues
 - h. Place, date and time for regular progress meetings.
13. CONTRACTOR shall be prepared to attend regular scheduled progress meetings. Progress meetings shall be held on weekly

basis or as discussed and agreed upon at the pre-construction meeting. The agenda for the progress meetings shall include but not be limited to:

- a. Review of work progress since previous meeting
- b. Field observations, problems, conflicts
- c. Work progress in relation to schedule. Revision of schedule if required
- d. Review of quantities for completed work
- e. Proposed changes to work, if any
- f. Other issues.

1.02 - CONTRACT

- A. Construct work under unit price contract.
- B. CONTRACTOR is to begin work within ten (10) days after the date of the NOTICE TO PROCEED and shall complete the work by November 30, 2023. If agreed by each party the City has the right to extend this contract for up to two additional years. The CITY has the right to extend add or omit roads as a result of ongoing utility work
- c. The time for completion noted above has been developed on the assumption that work will be suspended during winter shut-down. Winter shutdown shall be defined as the period from December 1st through the following April 1st. The CONTRACTOR shall plan on a winter shutdown period based upon these dates unless otherwise directed by the CITY.
- d. The winter shutdown dates are subject to change depending upon weather conditions and for the work to meet the environmental conditions as specified in Section 02600 (1.01.C) and Section 02630 (1.01.C) of these Specifications.
- e. The CITY shall notify the CONTRACTOR in writing if there is a change in the winter shutdown period due to weather, environmental or other conditions which preclude the work from being executed in accordance with these Documents.
- f. The CONTRACTOR may negotiate prices with the City after November 30, 2023 should additional work be required in subsequent years. Outstanding gas and utility work may require the schedule to be extended out to the fall of 2024. Every effort shall be taken by the City to minimize the mobilization into and out of the CITY by the CONTRACTOR. Negotiated prices can include asphalt escalators in accordance with RIDOT standard procedures.

1.03 - CONSTRUCTION SCHEDULE AND SEQUENCE OF WORK

- A. The CONTRACTOR shall submit to the CITY for approval a detailed work

sequence and schedule for the completion of all work associated with this contract. Approval of the work sequence and schedule is required prior to the start of any work associated with this contract. The proposed sequence and schedule must consider and address the safe pedestrian and vehicle passage through the project and vehicle and pedestrian access to the abutting properties and side streets. The CITY reserves the right to adjust the sequence and schedule at any time at no cost to the CITY.

- B. Construction by the CONTRACTOR shall be limited to the hours of 7:00 AM to 4:00 PM Monday through Friday. Work after 4:00 PM will only be allowed with prior approval by the Director of Public Works. No work shall take place on Saturdays, Sundays or on the following holidays:

1. Memorial Day (Monday, May 29, 2023)
2. Independence Day (Tuesday, July 4, 2023)
3. Victory Day (Monday, August 14, 2023)
4. Labor Day (Monday, September 4, 2023)
5. Columbus Day (Monday, October 9, 2023)
6. Veterans Day (Monday, November 13, 2023)
7. Thanksgiving Day (Thursday, November 23, 2023)

- C. CONTRACTOR shall be aware of any CITY, civic or church/funeral events. If a designated street is within the area of an event, work must be scheduled around the event so as not to impede vehicular or pedestrian traffic.

1.04 - CONTRACTOR USE OF PREMISES

- A. Confine operations at site to areas permitted by:
1. Law
 2. Ordinances
 3. Permits
 4. Contract Documents
- B. Do not unreasonably encumber site with materials or equipment.
- C. Assume full responsibility for protection and safekeeping of products stored on premises.
- D. Move any stored products which interfere with operations of CITY and other Contractors.
- E. Obtain and pay use of additional storage or work areas needed for operations.
- F. Remove all surplus material, temporary structures and debris resulting from the work and put the site in a neat, orderly condition before final payment.
- G. Assume full responsibility to maintain roadway safe for vehicular and pedestrian traffic during construction.
- H. The Contractor shall be responsible to contact Mike Romano, Rhode

Island Energy at 617-910-7854 when working within 200 feet of gas regulator station for station monitoring during road construction. Gas regulator stations located at intersections between Bullocks Point Ave and Crescent View Ave, Mauran Ave and First Street and Amaral Street and Wampanoag Trail.

END OF SECTION

2023 CITY ROADWAY IMPROVEMENTS
MEASUREMENT AND PAYMENT
SECTION 01150

SECTION 01150

MEASUREMENT AND PAYMENT

PART 1.00 - GENERAL

1.01 PAYMENT GENERAL

- A. Payment of the price set forth in the proposal is deemed to be full compensation for all materials, labor, tools, equipment and incidentals necessary to perform the work.
- B. It is the intention of these specifications and associated contract drawings to call attention to certain project features. Any related miscellaneous or incidental work not specified but obviously necessary to adequately complete the work shall be included within the following items.

1.02 BITUMINOUS CONCRETE PAVEMENT (ITEM 1a and 1b)

A. Measurement

Bituminous concrete pavement and bituminous material will be measured by the ton in accordance with Section 109 of the Rhode Island Standard Specifications for Road and Bridge Construction.

Batch weights will not be permitted as a method of measurement. The tonnage shall be the weight used in the accepted pavement and no deduction will be made for the weight of bituminous material in the mixture.

The total weight will be the summation of the weight slips of bituminous concrete actually incorporated in the work.

B. Payment

The accepted quantities of asphalt pavement will be paid for at the contract price per ton for the bituminous paving mixture including but not limited to the bituminous material complete in place **including driveway aprons, adjusting utility structures such as curb stops, water, gas gate boxes, manhole frame and covers and catch basin grates (3 inch +/-) to final grade, saw cutting pavement, sweeping and cleaning.**

1.03 PAVEMENT RECLAMATION (ITEM 2a)

A. Measurement and Payment

- 1. Reclaimed base course shall be measured in place to the limits specified or as directed, including at keyways where CIR process cannot access such as intersection curves/tie-ins, cul-de-sacs, end of streets at T-shaped intersection, etc. The accepted quantity of reclamation as measured shall be paid for at the contract unit price per square yard. This unit price shall include all compensation for crushing, pulverizing, blending, spreading, rough grading, saw cutting

and testing of material if directed.

2. The unit price bid shall also include compensation for all costs associated with the removal of the castings and lowering or protecting of existing utility structures. It shall also include all compensation for all labor, tools, equipment, materials and all incidental work necessary to complete work as specified.
3. Removal and disposal of unsuitable materials, surplus reclaimed materials or any subbase/subgrade material necessary for grade changes or to install new pavement surfaces shall be paid for at the contract unit price per cubic yard under Item 2c, Removal and Delivery of Existing Pavement and Earth Materials to the Forbes Street Landfill or as directed by the CITY.

1.04 GRADING AND COMPACTING (ITEM 2b)

A. Measurement and Pavement

1. Grading and compacting shall be measured by and paid for at the contract unit price per square yard.
2. Grading and compacting shall consist of rough and fine grading and compaction of the subbase to the required tolerances, lines, grades and specified compaction for the placement of bituminous concrete pavement, including areas not accessible by CIR process such as intersection curves, perimeters of cul-de-sacs, ends of T-shaped intersections, etc.
3. The CITY reserves the right to provide new roadway grades for any of the streets listed in Appendix A.

1.05 REMOVAL AND DELIVERY OF EXISTING PAVEMENT AND EARTH MATERIALS TO THE FORBES STREET LANDFILL (ITEM 2c)

A. Measurement and Payment

1. Removal and delivery of reclaimed materials (to the Forbes Street Landfill) due to pulverization of existing roadway materials, asphalt pavement, base material, or any subbase/subgrade material necessary for grade changes shall be paid for at the contract unit price per cubic yard. The CITY reserves the right to change delivery locations. Contractor is responsible to stockpile materials in an orderly fashion, using Contractor's equipment such as loader or bulldozer, as directed by the City.
2. Material removed shall be measured and determined by the length times width times depth of pre-pulverized flexible asphalt pavement. Removal of pavement or earth materials shall only be as directed by the City Engineer.

1.06 COLD IN PLACE RECYCLING (CIR) INCLUDING FOG SEAL (ITEM 3a)

A. Measurement

1. Work under this item shall be for actual square yards of Cold in Place Recycling Including Fog Seal as determined by the CITY.

B. Payment

1. Payment for this item shall be at the contract price per square yard of Cold in Place Recycling Including Fog Seal. Payment shall be full compensation for all items of work, labor, equipment, tools and other incidentals necessary for the satisfactory completion of this work including the disposal of excess material, sweeping and cleaning.

1.07 PRE-MILLING CIR Only (Item 3b)

A. Measurement

1. Work under this item shall be done in conjunction with the CIR. The work shall consist of removing, by cold-planer, asphalt pavement in designated areas. The milled material shall become the property of the City, to be disposed of at the Forbes Street landfill at no additional cost to the City.

B. Payment

1. Payment for this item shall be made at the contract price for actual square yards pre-milled in conjunction with CIR operations as directed by the CITY
2. Payment under this item is only required when the pre-milling is being done to remove material in order to maintain or control final paving grades. If the pre-milling is done solely for the Contractor's convenience to recycle pavement areas wider than the drum on the recycler (12'-6" minimum), no payment shall be made for pre-milling and the additional recycled roadway width will be paid for under ITEM 3a, "Cold In-Place Recycling (CIR) Including Fog Seal."

1.08 CORE SAMPLING (Item 3c)

A. Measurement

1. Work under this Item shall be for each full day the Contractor performs core samples for the Mix Design on CIR roads as directed by the CITY.

B. Payment

1. Payment for this item shall be made at the contract price for each full day core samples are taken. Payment shall be full

compensation for all items of work, labor, equipment, tools and other incidentals necessary for the satisfactory completion of this work including the filling of the cores, disposal of excess material, sweeping and cleaning.

1.09 MIX DESIGNS (ITEM 3d)

A. Measurement

1. Work under this item shall be for each accepted Mix Design per street being Cold in Place Recycled Including Fog Seal.

a) Obtain cored samples for the project mix design. Three hundred and fifty pounds (350 lbs.) of representative material to be recycled is required for each mix design.

b) An independent laboratory not owned or controlled by the Contractor shall develop and submit a Job Mix Formula (JMF) prior to the start of the CIR operation.

B. Payment

1. Payment for this item shall be made at the contract price for each Mix Design approved and accepted by the CITY.

1.10 LIQUID ASPHALT STABILIZING AGENT (ITEM 3e)

A. Measurement

1. Work under this item shall be for the actual gallons of Liquid Asphalt Stabilizing Agent incorporated into the work by the gallon as metered through a calibrated pump, calibrated auger, or through delivered ticket quantity, accepted by the CITY.

B. Payment

1. Payment for this item shall be full compensation at the contract price for each gallon of Liquid Asphalt Stabilizing Agent incorporated into the work and accepted by the CITY.

1.11 PORTLAND CEMENT STABILIZING AGENT (ITEM 3f)

A. Measurement

1. Work under this item shall be for the actual tons of Portland Cement Stabilizing Agent incorporated into the work by the ton as metered through a calibrated pump, calibrated auger, or through delivered ticket quantity, accepted by the CITY.

B. Payment

1. Payment for this item shall be full compensation at the contract price for each ton of Portland Cement Stabilizing Agent

incorporated into the work and accepted by the CITY.

1.12 DOWN TIME FOR CIR ONLY (ITEM 3g)

A. Measurement

1. If Contactor's daily productions is stopped due to no fault of its own (ie, buried utility structures not identified), the labor and equipment costs incurred will be paid at the bid hourly rate, only if delayed for more than 2 hours, as determined by the City, shall apply to this item. If work recommences within two hours of incident then no payment will be made by the City.

B. Payment

2. Payment for Down Time for CIR only shall be made at the contract price per hour for compensation of labor and equipment costs incurred during the delay period in excess of two hours after the incident occurs.

1.12 COLD PLANING (ITEM 4)

A. Measurement

1. Measurement for cold planing shall be the total square yards of planed roadway, including in areas where CIR cannot access such as intersection flares, perimeters of cul-de-sacs, ends of streets at T-shaped intersections, etc.

B. Payment

1. Payment for cold planing shall be made at the contract price per square yard for cold planing operations. Payment shall be full compensation for all items of work, labor, equipment, tools and other incidentals necessary for the satisfactory completion of this work including the disposal of asphalt cuttings, sweeping and cleaning.

1.13 PAVEMENT MARKINGS, THERMOPLASTIC (ITEM 5a and 5b)

A. Measurement

1. Installing of new striping, "Pavement Markings", shall be measured by the linear foot of material (excluding skips and spaces) in the widths specified and directed complete in place and accepted.

B. Payment

1. Pavement Markings shall be paid for at the contract unit price per linear foot.

1.14 HANDICAP SIDEWALK ACCESS RAMP (ITEM 6)

A. Measurement

1. Handicap sidewalk access ramps shall be measured by the actual number constructed.

B. Payment

1. Handicap Sidewalk Access Ramps shall be paid for at the contract unit price. Such price shall constitute full compensation for concrete/curb removal, saw cutting, saw cutting existing granite curb (to length and into transitions) excavation, concrete (bituminous and/or Portland cement) and curb (including transition) placement and all labor, tools, equipment and incidentals necessary to complete the work to the satisfaction of the City Engineer.

1.15 GRAVEL BORROW Provided by City (ITEM 7)

A. Measurement

1. Gravel borrow shall be measured by the actual cubic yards of gravel borrow compacted in place, as directed and specified by the CITY.

B. Payment

1. Payment for gravel borrow shall be made at the contract price per cubic yard, including trucking from Forbes Street to work site, complete in place.
2. Gravel borrow used for resetting curb and concrete sidewalks shall not be paid under this item but is made incidental to those items.

1.16 POLICE DETAIL (ITEM 8)

A. Measurement

1. Police details, Item 8, shall be measured on the basis of hours worked.

B. Payment

1. Payment for police traffic control shall be paid in accordance with RIGL 37-12-10.
2. The CONTRACTOR shall be responsible for scheduling municipal police officers for traffic control purposes through the East Providence Police Department. If traffic control assignments are canceled without twenty-four (24) hours notice, the CONTRACTOR is responsible to pay the CITY for the hours Police Officers would have worked.
3. The CITY shall pay the Police Department directly based on police services invoice itemizing the dates and hours worked.

1.17 GATE BOX ADJUSTMENT AND/OR REPLACEMENT (ITEM 9)

A. Measurement

1. Work under this Item shall include adjusting and/or replacing gate boxes as determined by the CITY. This item shall also include all gate boxes removed and adjusted as part of Cold in Place Recycling. The CITY shall supply to the CONTRACTOR the new water gate box. It will be the CONTRACTOR'S responsibility, at no cost to the City, to make arrangements with Rhode Island Energy, etc. to obtain the appropriate small utility structure. Work under this Item shall also include adjustments greater than 3" gate boxes as determined by the CITY. The CONTRACTOR shall supply all labor, equipment and materials needed to adjust the manholes and drainage structures.

B. Payment

1. Payment will be made for each gate box that is adjusted and/or replaced and accepted in the work. The CONTRACTOR shall supply all labor, equipment and materials needed to install the gate box provided by the CITY. No gate box shall be replaced unless approved by the CITY.

1.18 MISCELLANEOUS WORK AND CLEAN UP (ITEM 10)

A. Measurement and Payment

1. Payment of the lump sum established in the proposal for Item 10 shall be full compensation for all labor, materials and equipment required to do all work of this contract as specified or as shown on the drawings for Item 10 or any payment under any other Item but obviously necessary to complete the contract. This includes the contractor being responsible to post no-parking signs and distributing notice of work letters to residents around the area of work, 48 hours prior to commencing work.
2. Specific work items included under this Item are listed in Section 02989, Miscellaneous Work and Clean Up.

1.19 MANHOLE FRAME AND COVER REPLACEMENT (ITEM 11)

A. Measurement

1. Work under this Item shall include replacing manhole frames and covers in need of replacing as determined by the CITY. The CITY shall supply to the CONTRACTOR the new frame and cover. The CONTRACTOR shall supply all labor, equipment and materials needed to install the manhole frame and cover provided by the CITY. No manhole frame and cover shall be replaced unless approved by the CITY.

B. Payment

1. Payment will be made for each manhole frame and cover replaced and accepted in the work.

1.20 RESETTING EXISTING CURB, CURB RETURNS, TRANSITIONS, RADIUS STONE, INLETS, ETC. (ITEM 12)

A. Measurement and Payment

1. Reset curbing will be measured by the linear foot along the front face of the section at the finished grade elevation. The accepted quantities of reset curbing will be paid for at the contract unit price per linear foot for existing curbing reset in place and accepted.
2. This price shall constitute full compensation for removing and resetting existing curbing, curb returns, transitions, radius stone, inlets, etc., as indicated, including any saw cutting, removal of unsuitable material and backfilling and compacting suitable materials if required, repair and replace disturbed asphalt and grass areas, clean curb lock/removal from curb and trench, installation of concrete curb lock, repair and cleanup of area where curb is to be reset and any equipment and incidentals necessary to complete the work as shown on the Contract Drawings and specified herein to the satisfaction of the CITY.
3. Reset curbing for the construction of the handicap access ramps shall not be paid under this ITEM.

1.21 FURNISH & INSTALL NEW 6" GRANITE CURB (ITEM 13)

A. Measurement

1. Measurement for new granite curb shall be the actual linear feet of new granite curb installed and locked in place with Portland concrete cement in locations as directed by the CITY.

B. Payment

1. Payment for furnishing and installing new granite curb shall be Made for the quantity price per linear foot in the proposal (See EP Standard Detail R-31) Payment shall be full compensation for saw cutting, excavation, removal of existing materials (Concrete/Asphalt, Top soil/Loam, etc.), trimming of tree roots, additional gravel base, trimming and fine grading, compaction of gravel base, forms, reinforcing mesh, furnishing and placing concrete, concrete curb lock, joint materials, joint sealer, asphalt and all incidentals required to satisfactorily complete the installation of granite curb.

1.22 CONCRETE SIDEWALKS (ITEMS 14 & 15)

A. Measurement

1. Measurement for concrete sidewalks shall be the actual square yards of concrete complete in place in the accepted work.

B. Payment

1. Payment for concrete sidewalks shall be made for the quantity price per square yard in the proposal (See Sidewalk Detail R-65). Payment shall be full compensation for saw cutting, excavation, removal of existing materials (Concrete/Asphalt, Top soil/Loam, etc.), trimming of tree roots, additional gravel base, trimming and fine grading, compaction of gravel base, forms, reinforcing mesh, furnishing and placing concrete, joint materials, joint sealer, asphalt and all incidentals required to satisfactorily complete the installation of concrete sidewalks.
2. Full compensation for raising and adjusting all utility structures, gravel base to the required depth, placement of asphalt as needed to match sidewalks to driveway aprons, and loaming and seeding where existing ground was disturbed, shall be included in the cost per square yard of concrete.

1.23 CUTTING OF CEMENT CONCRETE DRIVEWAYS
(ITEM 16)

A. Measurement

1. Measurement for cutting and matching of driveways shall be the actual linear feet of cutting back and matching cuts in both Portland cement and bituminous concrete pavements to the required depths of the specified course or courses at the locations indicated in the Contract Documents and as directed by the CITY.

A vertical cut of at least two (2) inches deep shall be made along the designated lines. The pavement to be removed shall be then chipped and removed (up to two (2) feet as directed by the CITY). The edge of the cut joint shall be thoroughly cleaned by sweeping and blowing with compressed air.

B. Payment

1. Payment for cutting and matching of bituminous/cement concrete driveways shall be made for the quantity price per linear foot in the proposal. Payment shall be full compensation for all labor, materials and equipment and all other incidentals required to finish the work complete and accepted by the CITY. Driveway apron paving will be included under Item 1a. and 1b.

1.24 REMOVAL AND DISPOSAL OF CEMENT CONCRETE DRIVEWAYS (Forbes St Landfill)
(ITEM 17)

A. Measurement

1. Measurement for removal and disposal of Cement Concrete Driveways shall be the actual square yards of driveways (full depth) at the locations indicated in the Contract Documents and as directed by the CITY.

This work includes full depth saw cutting a clean edge at the

driveway, removal and disposal of concrete and establishing grade.

B. Payment

1. Payment for Removal and Disposal of Cement Concrete Driveways shall be made for the quantity price per square yard in the Proposal. Payment shall be full compensation for all labor, materials and equipment and all other incidentals required to finish the work complete and accepted by the CITY.

1.25 HANDWORK (ITEM 18)

A. Measurement

1. Measurement of Handwork under this Item shall be by the square yard and include the cutting and disposal of bituminous sidewalk, fine grading, installation of gravel and installation of bituminous material by hand, and labor and equipment. This excludes work within driveway aprons.

A. Payment

1. The accepted quantities of asphalt pavement will be paid for at the contract price per square yard for the bituminous paving mixture including but not limited to the bituminous material complete in place to final grade, saw cutting pavement, sweeping and cleaning.

1.26 BITUMINOUS BERM INSTALLATION (ITEM 19)

A. Measurement

1. Work under this Item shall include furnishing and installing bituminous berm (R. I. Standard 7.5.1) at the locations indicated in the Contract Documents and as directed by the CITY.

The quantity of bituminous berm, Item 19, to be paid for will be the amount in linear feet actually placed as measured along the top of the exposed face of the berm.

B. Payment:

1. Payment will be made at the unit prices indicated in the Bid Proposal for Item 18.

1.27 GRANITE INLET STONE INSTALLATION (ITEM 20)

A. Measurement

1. Work under this Item shall include furnishing and installing Granite Inlet Stone (East Providence Std. R-33) as well as the removal and disposal of existing

inlet stone at the locations indicated in the Contract Documents and as directed by the CITY.

The quantity of the Granite Inlet Stones, Item 20, to be paid for will be the actual number of inlet stones removed and replaced as determined prior to removal.

B. Payment:

1. Payment will be made at the unit price indicated in the Bid Proposal for Item 20. No additional payments will be made for excavation, removal of unsuitable materials, removal and disposal of bituminous and concrete pavement, supplying and installing new granite inlet stone (East Providence Std. R-33) grading and compacting, layout, backfilling, cutting and trimming as necessary, gravel borrow subbase course, placement of temporary asphalt pavement, cleaning up, mortar at catch basin joints, etc. or any incidentals needed for completing the work as set forth herein, in the plans and specifications except as noted in the proposal. Also, included shall be the necessary supplying and transportation of materials to the various job sites.

1.28 ADJUSTMENTS TO MANHOLES AND DRAINAGE STRUCTURES (ITEM 21)

A. Measurement

1. Work under this Item shall include adjustments greater than 3" to manholes and drainage structures as determined by the CITY. This item shall also include all manholes and drainage structures removed and adjusted as part of Cold in Place Recycling. The CONTRACTOR shall supply all labor, equipment and materials needed to adjust the manholes and drainage structures.

B. Payment

1. Payment will be made for each manhole and drainage structure that is adjusted.

1.29 REBUILD CATCH BASINS OR MANHOLES (ITEM 22)

A. Measurement

1. Work under this item shall be for actual vertical feet of the structure rebuilt as determined by the CITY.

B. Payment

1. Payment for this item shall be made at the contract price per vertical foot for rebuilding the structure. Payment shall be full compensation for all items of work, labor, equipment, tools and other incidentals necessary for the satisfactory completion of this work including the disposal of excess material, sweeping and

cleaning.

1.30 REPLACE TRAFFIC LOOP (ITEM 23)

A. Measurement

1. Work under this item shall be for each traffic loop replaced as part of the work as determined by the CITY.

B. Payment

1. Payment for this item shall be made at the contract price for each traffic loop replaced. Payment shall be full compensation for all items of work, labor, equipment, tools and other incidentals necessary for the satisfactory completion of this work including the disposal of excess material, sweeping and cleaning.

1.31 VARIABLE WIDTH HOT MIX ASPHALT SIDEWALK (ITEM 24)

A. Measurement

1. Work under this item shall be for actual square yards of asphalt sidewalk installed as directed by the CITY.

B. Payment

1. Payment for this item shall be full compensation for work completed at the contract price. Payment shall be for removing and disposing of all existing asphalt, grading and installation of 2 - 1.5" lifts of 9mm (3/8") bituminous concrete asphalt and all additional items of work, labor, equipment, tool and other incidentals necessary for the satisfactory completion of this work including the disposal of excess material, sweeping, and cleaning.

(ADD/ALTERNATE)

1.26 HIGH DENSITY POLYETHELENE PIPE (HDPE) (ITEM 25a, 25b, 25c)

A. Measurement:

1. Measurement of 12, 18 and 24-inch HDPE Pipe of the type and size specified for ITEM 25a, 25b, 25c shall be measured in place on a linear foot basis. Measurements shall be along the grade of the pipe from center of manholes to ends of stubs. Measurement shall include the length of wyes or other fittings.

B. Payment:

1. Payment under the linear foot price established in the proposal for ITEM 25a, 25b, 25c shall be full

compensation for all labor, materials, equipment, to furnish, lay and joint pipe, trench excavation and/or disposal of excavated material as directed including pavement removal to the limits shown on the detail, plating and/or protecting trench after work hours, saw cutting of roadway, trench dewatering, bedding materials INCLUDING $\frac{3}{4}$ -INCH crushed stone per detail/manufacturers recommendation, common fill, backfill, compaction, restoration, providing a 2-inch thick temporary patch, cutting existing pipe, erosion control, miscellaneous work and cleanup and incidentals required to satisfactorily complete the installation of the HDPE pipe and restore miscellaneous lawn areas and driveways to a condition similar or better than before work was started.

1.27 FURNISH AND INSTALL PRECAST DRAINAGE MANHOLE WITH FRAME AND COVER UP TO 8-FOOT DEPTH(East Providence City Std. C-35) (ITEM 26)

A. Measurement:

1. Measurement of ITEM 26 shall be measured by the actual number installed in accordance with the contract drawings and/or as directed by the City.

B. Payment:

1. Payment for furnishing and installing ITEM 26 shall be full compensation per the unit bid price for each finished installation as shown on the contract drawings. This price includes frame and cover as well as all necessary mortar and brick for proper adjustment of frame and cover as well as for invert and shelf.

1.28 FURNISH AND INSTALL PRECAST 4-FOOT DIAMETER WITH DEEP SUMPS CATCH BASINS WITH FRAME AND GRATES, UP TO 9-FOOT DEPTH (ITEM 27)

A. Measurement:

1. Measurement of ITEM 27 shall be measured by the actual number installed in accordance with the contract drawings and/or as directed by the City.

B. Payment:

1. Payment for furnishing and installing ITEM 27 shall be full compensation per the unit bid price for each finished installation as shown on the contract drawings. This price includes frame and cover as well as all necessary mortar and brick for proper adjustment of frame and cover.

1.32 WORK BEYOND SCOPE OF CONTRACT

A. Measurement and Payment

1. Necessary work outside the scope of this Contract shall be undertaken only after submittal and approval of a Change Order request. Payment for work completed as part of any Change Order shall conform to the following.
 - **LABOR** including foreman, not including superintendent, to include all insurance and fringe benefits such as social security, pension, unemployment, etc.
 - **COST OF MATERIALS** entering permanently into the work. All invoices must be submitted to the CITY.
 - **THE RENTAL COSTS** of all construction plant and equipment used in performing this work. Blue Book rates will be used.
 - **POWER AND CONSUMABLE SUPPLIES** for the operation of power equipment.

1.33 APPLICATION FOR PAYMENT

- A. CONTRACTOR shall submit an Application for Payment for completed work in accordance with Article 8, Payments to Contractor, on a monthly basis.
- B. Application for Payment may be submitted using standard AIA Document G702, or other agreed upon format.
- C. Application for Payment shall include an itemized breakdown of work completed in tabular form with the following information: Item Number and Description, Unit, Contract Quantity, Unit Cost, Total Cost, Quantity for Payment this Application, Quantity Previously Paid, Quantity to Date, Amount this Application, Amount Previous Application, Amount Paid to Date, Percent Complete.
- D. Each Application for Payment shall be accompanied by a Work Summary Sheet detailing quantities installed on each street section for the application period.

END OF SECTION

2023 CITY ROADWAY IMPROVEMENTS
TEMPORARY FACILITIES AND CONTROLS
SECTION 01500

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. Related Work Described Elsewhere:

1. Summary of Work - Section 01010
2. Measurement and Payment - Section 01150

1.02 TEMPORARY UTILITIES

A. Light, Electricity and Telephone:

Furnish and install all necessary temporary water piping and wiring required to facilitate performance and completion of the work and remove all such temporary piping and wiring upon completion of the work. Pay all costs for providing and removing temporary utilities.

B. Sanitary Facilities:

1. Furnish and install sanitary conveniences for the use of all persons employed on the work, properly screened from public observation. Provide facilities in sufficient numbers in such manner and at such points as shall be approved. The contents shall be removed and disposed of in a satisfactory manner as the occasion requires. The CONTRACTOR shall vigorously prohibit the committance of nuisances within, on, or about the work. Any employees found violating these provisions shall be discharged and not again employed on the work without the written consent of the CITY.
2. The CONTRACTOR shall supply sufficient drinking water from approved sources to all of his employees.
3. The sanitary conveniences specified above shall be the obligation and responsibility of the CONTRACTOR until the completion of the work. The facilities shall be made available to all subcontractors and their employees.

C. Water for Construction Purposes:

1. The express approval of the Water Utilities Superintendent shall be obtained before water is used. Waste of water by the CONTRACTOR shall be sufficient cause for withdrawing the privilege of use. Hydrants shall only be operated under the supervision of Water Utilities Division personnel.

All water used shall be metered and reported to the CITY for record keeping purposes.

1.03 GUARDRAIL AND BARRICADES

- A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution and advanced warning signs, lights and other means to prevent accidents to persons and damage to property. The CONTRACTOR shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen.
- B. The CONTRACTOR shall take precautions to prevent injury to the public due to construction. All excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.
- C. The CONTRACTOR shall not open or excavate any street, way, or public or private place until contact has been made with all utilities to locate any existing underground gas, water, telephone, power or other installations.

1.04 PROTECTION OF WORK AND PROPERTY

- A. The CONTRACTOR shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act of, omission, neglect, or misconduct in the execution of the work on the part of the CONTRACTOR, the CONTRACTOR shall restore said damage, at his expense, to a condition similar or equal to that existing before the damage was done and at least meeting the Specifications contained herein.
- B. Along the location of this work all fences, mail boxes, walks, bushes, trees, shrubbery and other physical features shall be protected and restored in a thoroughly workmanlike manner. Fences and other features removed by the CONTRACTOR shall be replaced in their original location. All grass areas beyond the limits of construction which have been damaged by the CONTRACTOR shall be regraded and seeded.
- C. The protection, removal and replacement of existing physical features along the line of work shall be a part of the work under the contract, and all costs in connection therewith shall be included in the unit and/or lump sum prices established under the Items in the proposal.

1.05 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

- A. The CONTRACTOR shall assume responsibility for the protection of all buildings, structures and utilities, public or private, including poles, signs, services to buildings, water pipes, hydrants, sewers, drains and electric and telephone cables, whether or not they are shown on the drawings. The CONTRACTOR shall carefully support and protect all such structures and utilities from injury of any kind. Any damage resulting from the CONTRACTOR's operations shall be repaired by him at his expense.

- B. Protection and temporary removal and replacement of existing utilities and structures as described in this Section shall be a part of the work under this contract and all costs in connection therewith shall be included in the price established in the proposal.
- C. The CONTRACTOR, however, shall bear full responsibility for obtaining all locations of underground structures and utilities (including existing water services, drain lines and sewers). Services to buildings shall be maintained and any costs or charges resulting from damage thereto shall be paid for by the CONTRACTOR.
- D. If, in the opinion of the CITY, permanent relocation of the utility owned by the CITY is required, the CITY may direct the CONTRACTOR in writing, to perform the work. Work so ordered will be paid for at the Contract unit prices, if applicable, or as extra work under Article 41 of the General Conditions. If relocation of a privately owned utility is required, the CITY will notify the utility to perform the work as expeditiously as possible. The CONTRACTOR shall fully cooperate with the CITY and utility, and shall have no claim for delay due to such relocation. The CONTRACTOR shall notify public utility companies in writing at least 48 hours (excluding Saturdays, Sundays and legal holidays) before excavating in any public way.
- E. The Contractor shall be responsible to contact Mike Romano, National Grid at 617-910-7854 when working within 200 feet of gas regulator station for station monitoring during road construction. Gas regulator stations located at intersections between Bullocks Point Ave and Crescent View Ave, Mauran Ave and First Street and Amaral Street and Wampanoag Trail.

1.06 MAINTENANCE OF FLOW

The CONTRACTOR shall at his own cost, provide for the flow of sewers, drains and water courses interrupted during the progress of the work, and shall immediately cart away and remove all offensive matter. The entire procedure of maintaining existing flow shall be fully discussed with the CITY well in advance of the interruption of the flow.

1.07 EROSION CONTROL

The CONTRACTOR shall take all necessary precautions to prevent and control erosion and to construct sediment basins, diversion ditches or such other construction to satisfactorily accommodate runoff from any area subject to erosion during the construction of this project. All such precautionary measures including but not necessarily limited to construction of sediment basins, diversion ditches, catch basin sediment traps/berms, beaches and berms or laying fiber matting on slopes until vegetation is established, shall be at no extra cost to the CITY.

1.08 DUST CONTROL

The CONTRACTOR shall take all necessary precautions at all times to prevent and control dust. In addition, daily dust control shall be performed as directed by the CITY to control dust at the close of workday

operations. Specifically, all traveled ways shall be swept thoroughly, and calcium chloride spread to prevent dust from being a nuisance to the general public.

1.09 DETOURS

- A. Unless permission to close the street is received in writing from the proper authority, all excavated material shall be placed so that vehicular and pedestrian traffic may be maintained at all times. If the CONTRACTOR's operations cause traffic hazards, he shall repair the road surface, provide temporary ways, erect wheel guards or fences, or take other measures for safety satisfactory to the CITY.
- B. The local Fire Department and Police Department shall be notified in advance of any and all detours being implemented.
- C. Detours around construction shall be subject to the approval of the CITY. Where detours are permitted the CONTRACTOR shall provide all necessary barricades, signs and warning devices as required to divert the flow of traffic. While traffic is detoured the CONTRACTOR shall expedite construction operations and periods when traffic is being detoured shall be strictly controlled by the CITY.

END OF SECTION

2023 CITY ROADWAY IMPROVEMENTS
TRAFFIC CONTROL
SECTION 01570

SECTION 01570

TRAFFIC CONTROL

PART 1.00 GENERAL

1.01 DESCRIPTION OF WORK

- A. The CONTRACTOR shall keep the roadway under construction open to traffic for the full length of the project and shall provide a sufficient number of travel lanes and pedestrian passway to move that traffic ordinarily using the roadway. The travel lanes and pedestrian passway shall be drained and kept reasonably smooth, clean and in suitable condition at all times in order to provide minimum interference to traffic consistent with the proper prosecution of the work.
- B. Related Requirements Specified Elsewhere:
 - 1. Temporary Facilities and Controls - Section 01500.

PART 2.00 PRODUCTS

2.01 MATERIALS

- A. All the materials provided to be utilized as traffic control devices shall conform to the requirements of the latest Manual on Uniform Traffic Control Devices and the Rhode Island Department of Transportation.

PART 3.00 EXECUTION

- A. The CONTRACTOR is placed on notice that the maintenance and protection of traffic over this roadway during construction period is considered as important and necessary an item of work as is the actual construction itself. The CONTRACTOR shall at all times conduct his operation in a manner to insure the safety of not only the motorist but also the pedestrian and his own employees.
- B. Suitable ingress and egress shall be provided at all times where required, for all intersecting roads and for all abutting properties having legal access.
- C. The CONTRACTOR shall furnish all signs, barricades, traffic cones, traffic delineators, pavement markings and warning devices necessary to forewarn, safeguard, and guide the traveling public through the construction area.
- D. The CONTRACTOR shall erect, maintain, wash, move, adjust, replace, relocate, re-erect and store these signs, barricades, traffic cones, delineators and warning devices when, where and as directed by the

CITY.

- E. All signs, barricades, traffic cones, traffic delineators and warning devices shall conform to the "Manual of Uniform Traffic Control Devices."
- F. All signs and markers shall indicate actual conditions existing and shall be moved, removed or changed immediately, as conditions require.
- G. The CONTRACTOR shall provide police officers as may be deemed necessary by the City Engineer and/or Chief of Police for the direction and control of vehicular traffic and pedestrians within the limits of the project and such officers shall wear regulation policemen's uniforms and should be regular, reserve or special officers.
- H. If the CONTRACTOR fails to maintain and protect traffic adequately and safely by means of traffic control devices and/or traffic men for a period of 24 hours, the CITY may correct the adverse condition by the use of police officers, augmented if necessary by such other equipment and personnel as it may be necessary to hire, and the entire cost of this work by such forces shall be deducted from any monies due to the CONTRACTOR on this contract.
- I. It shall be the responsibility of the CONTRACTOR to post temporary "No Parking" signs 24 hours in advance of any work. The CITY will be responsible for closing and opening the road to traffic. The CONTRACTOR shall notify the CITY at least 48 hours in advance of any proposed work. Temporary "No Parking" signs will be provided by the CITY.
- J. Proposed Detours shall be coordinated with the CITY.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1.00 GENERAL

1.01 DESCRIPTION OF WORK

- A. Work under this section includes, but is not necessarily limited to, the following:
1. Excavating and trenching.
 2. Filling, backfilling, and compacting fill conforming to these specifications where applicable.
 3. Rough grading to required tolerances.
 4. Filling, as directed, excess cut under footings, foundations, and trenches.
 5. The placing of earth for forming and shaping of embankments.
 6. Sheet piling and shoring where required and/or necessary.
 7. Maintaining bench marks, monuments, and other reference points. Obtaining accurate placement of final grade. Replacement of any disturbed or destroyed site elements that must be removed due to the nature of the work, furnishing certification by a professional surveyor that all disturbed items have been accurately relocated.
 8. Written notice of readiness of footing excavations, fill materials, fill areas, compacted fills, and items requiring review and/or inspection by the CITY.
 9. Maintaining excavation and trenches free of water.
 10. Excavating, stock piling and placing material suitable for filling and backfilling.
 11. Removing from site all debris, unsuitable material and excess excavated material as specified and/or as directed by CITY.
 12. Restoration to original grades and condition, properties damaged by any activity related to the work, taking adequate precautions to avoid settlement or cave-in of properties higher than site, silting, erosion, or other damage to properties lower than site.
 13. Installing temporary barriers to deter unauthorized access to areas of excavation or other such work which could be hazardous for the duration of the contract.

PART 2.00 PRODUCTS

2.01 MATERIALS

- A. Fill materials shall be reviewed, and shall conform to the following unless specifically indicated otherwise:
1. Fill, unless otherwise specified, shall be earth free of debris, cinders, combustibles, frost, ice, roots, sod, wood, cellulose, and organic materials. Up to 30 percent of fill material may be rock-like materials not more than 10" in length, evenly distributed in fill eighteen (18) inches below finished grade.
 2. Upper 18 inches of fills under topsoil of lawn and planted areas shall be earth free of debris, cinders, frost, ice, sod, wood and roots of 1/4" in diameter. Up to ten (10) percent of fill materials may be rock-like materials not to exceed 4" in length.
 3. Selected backfill shall be excavated materials, free-draining, clean, granular soil suitable for backfill. It shall not be frozen and shall be free from peat, vegetable or organic matter and any other debris and shall be readily compactible.
 4. Bank run gravel shall be of a granular nature, the major portion of which may be sand, gravel, and other stone. It shall not be frozen and shall be free from peat, vegetable or organic matter and any other debris and shall be readily compactible. See trench backfill section for size requirements.
 5. Fill under foundations and below bottom of concrete floors shall be clean, granular fill from stockpile or from off-site borrow area and shall consist of bank-run sandy gravel or gravely sand free of roots, sod, rubbish or other deleterious organic matter, fine silt, or clay.
- B. Crushed gravel base shall conform to the following gradation requirements:

<u>SIEVE SIZE</u>	<u>PERCENT FINER BY WEIGHT</u>
1½"	100
¾"	50 - 85
"	45 - 80
No. 4	40 - 70
No. 40	0 - 45
No. 200	0 - 10

Crushed stone shall conform to the following gradation requirements:

<u>SIEVE SIZE</u>	<u>PERCENT FINER BY WEIGHT</u>
2 ¼"	100
2"	90 - 100
1 ½"	30 - 55
1 ¼"	0 - 25
1"	0 - 5

- C. Grain-size distribution curve shall be furnished to CITY by a soil test lab Engineer for all materials supplied on this project.
- D. Areas from which fill material is obtained shall have been completely stripped of topsoil and underlying sandy silt material. No fill shall be brought to site or purchased until such material has been reviewed by CITY. Fill shall conform in quality to sample as provided by the CONTRACTOR which conforms to the gradation requirements set forth herein. Sample materials shall be submitted for review by CITY and maintained as representative for contract duration.
- E. Fill, outside of building toe of slope, shall be earth free of debris, cinders, combustibles, frost, ice, wood, roots, cellulose, and organic materials. Up to 40 percent of fill material may be rock-like materials not to exceed 0.02 cubic foot in volume, nor more than 3" in length.
- F. Class C bedding shall be screened, crushed stone meeting the requirements of ASTM Designation C 33-71A, Gradation 67.

PART 3.00 EXECUTION

3.01 GENERAL EXCAVATION REQUIREMENTS

- A. Where used herein "finished grade" refers to final grade at elevation indicated. Spot elevations govern contour elevations. Subgrade under lawn areas shall be maintained at 6" lower than "finished grade", unless indicated otherwise in Section 02900, "Landscaping".
- B. The extent of excavation open at any one time shall be controlled by the conditions, but shall always be confined to the limits prescribed by the CITY.
- C. At least one lane of traffic shall be open at all times. The CONTRACTOR shall take the necessary care in the placement of excavated materials so as not to block the passage of vehicles or pedestrians where access maintenance is required.
- D. No excavated material shall be placed on lawns, driveways or other private property. All disturbed areas shall be restored to conditions as described herein at no additional cost to the CITY.
- E. The CONTRACTOR shall take all necessary measures to protect trees not to be removed from the site of the work against damage from machinery and from excavated material. Branches and roots shall not be cut unless permitted by the CITY.

- F. Trees, cultivated plants, shrubs and hedges which might be damaged by the CONTRACTOR's operations shall be protected or shall be transplanted, maintained, watered, and replanted. Trees to be saved shall be protected by the installation of 2 x 4's wrapped around the trunk to a height of at least six (6) feet with approximately 6-inch to 8-inch spacing, depending on trunk diameter and a snow fence installed at the drip line. If such trees, plants, shrubs or hedges are damaged to the degree that their growth or beauty is affected, they shall be replaced by the CONTRACTOR at his own expense. All surfaces which have been damaged by the CONTRACTOR's operations shall be restored to a condition at least equal to that in which they were found just prior to the start of construction.

Damaged trees shall be replaced at a cost of One Hundred Dollars (\$100.00) per caliper inch and maintained as specified herein.

- G. The restoration of existing property shall be done as promptly as practicable, not no more than 14 days after the installation of the wearing course.
- H. All existing pipes, poles, wires, curbing, property line markers, fences, walls, or other structures which, in the opinion of the CITY, must be preserved in place without relocation shall be carefully supported and protected by the CONTRACTOR. In the event of damage they shall be restored to their original condition by the CONTRACTOR at his own expense.
- I. The CONTRACTOR shall note that the proposed structures and/or the line of the sewers cross existing utilities in certain locations. These have been shown based on best available information, but not guaranteed as to completeness or accuracy. Notify DIGSAFE before starting earthwork.
- J. As excavation approaches existing utilities or other underground structures, digging with machinery shall cease and the excavation shall be done manually, as directed.
- K. Excavation and backfill operations adjacent to existing utilities, structures, and construction shall be done in such a manner as will prevent the loss of ground or caving in of excavation, the undermining, damage or disturbing of existing pipelines, utilities and structures or any completed construction of the project.

Backfill shall be placed, compacted, and done in such a manner as to prevent future settlement and damage to the existing pipelines, utilities, structures, or construction. Existing pipelines, utilities, structures, new construction, or property damaged due to excavation, backfilling and settlement of the backfill, shall be the responsibility of the CONTRACTOR, and shall be corrected in a manner satisfactory to the CITY, at no additional expense to the CITY.

- L. Unsuitable excavated material shall systematically be separated and removed from suitable material to the satisfaction of the CITY.
- M. Unsuitable material shall be disposed of properly by the CONTRACTOR at no additional cost to the CITY.

- N. Surplus suitable material shall be the property of the CITY and stored on site as directed, or at the CITY's request, this material shall be removed from the site by the CONTRACTOR at no additional cost to the CITY.
- O. Boulders over 16" in length, if encountered, shall be removed from subgrade of cut areas.
- P. Remove obstructions to depth of 6" below new construction and 8" below subgrade in other areas.
- Q. Support banks of excavations, where necessary, to protect persons and property, using suitable combinations of shoring, sheet piling, bracing or other methods.
- R. If excavation goes beyond lines shown in details, CONTRACTOR shall use backfill conforming to materials specified herein and shall compact backfill to 95% or as otherwise directed by the CITY.
- S. Excavations shall be carried to design depths.
- T. If excavation is carried beyond line or below grade, except as directed, or subgrade is made unsatisfactory by act or neglect of CONTRACTOR, he shall remove such unsatisfactory material. No extra payment will be made for replacement with satisfactory fill, or additional concrete, or other method as directed.
- U. CONTRACTOR shall provide adequate dust control during earthwork operations. Public ways shall be cleaned daily if required by intensity of the work, traffic, and weather.
- V. CONTRACTOR shall provide and maintain temporary barricades and traffic controls as required.
- W. Contractor shall install and maintain all erosion control measures in accordance with the Rhode Island erosion control manual.

3.02 CUTTING PAVEMENT

- A. Excavations made on pavement shall be made in a careful manner so as to cause the least amount of damage to the pavement. Roadway pavement in state highways, local roads, sidewalks, and easement having Class 1 and Class 2 bituminous concrete pavement shall be saw cut prior to trench excavation. Pavement and/or cement concrete will be cut six (6) inches either side of the maximum allowable trench width. Any damage to the cut line due to the excavations, backfilling, or removal of temporary pavement shall be recut to neat lines at no additional cost to the CITY prior to replacement of the specified finished pavement. The width of pavement removed shall be kept as narrow as practicable. Existing pavement and base course disturbed or damaged beyond the payment lines indicated shall be replaced by the CONTRACTOR to match existing pavement and base course, at no additional cost to the CITY.

- B. CONTRACTOR shall remove and dispose of existing bituminous concrete pavement as is necessary to perform work of this contract as indicated.
- C. CONTRACTOR shall saw cut, remove and dispose of concrete and bituminous pavement as is necessary to perform the work of this contract. Removal of concrete and bituminous walks shall be performed in a neat manner at the nearest joint of the remaining walk pavement.
- D. Excavated pavement shall not be mixed with other excavated material which is to be used as backfill, and shall be removed immediately from the site of the work. This pavement may be reused as backfill so long as it is cold processed to a maximum dimension of two inches in any dimension and depth of processing is two to three times the depth of the existing bituminous concrete pavement and mixed to a homogeneous gradation.

3.03 ROCK EXCAVATION AND DISPOSAL

- A. Rock excavation shall mean removal and disposal of rock material as directed by CITY.
- B. It is not anticipated that rock shall be encountered. However, CONTRACTOR shall be paid for all rock encountered based on unit prices and items of rock (open/trench) stated elsewhere in this specification.
- C. All rock removal shall be in conformance with local and state authorities having jurisdiction over this work.
- D. Definition of "rock excavation" shall mean:
 - 1. Materials that cannot be removed without systematic drilling and blasting, such as rock material in ledges, or aggregate conglomerate deposits so firmly cemented as to possess the physical characteristics of solid rock.
 - 2. Concrete or masonry structures larger than one (1) cubic yard in volume, and not less than thirteen (13) inches in least dimension.
 - 3. Reinforced concrete larger than one (1) cubic yard in volume, with steel reinforcement.
 - 4. Boulders one (1) cubic yard or more in volume, sound rock material in ledges, bedded deposits and unstratified masses which cannot be removed without blasting.
- E. When, during excavation, material is encountered that CONTRACTOR may classify as rock excavation, such material shall be uncovered and CITY notified by CONTRACTOR. CONTRACTOR shall not proceed with excavation of this material until CITY has classified material as earth excavation or rock excavation. Failure on part of CONTRACTOR to uncover such material and notify CITY will cause forfeiture of CONTRACTOR's right of claim for payment of rock excavation.

- F. Blasted rock shall be removed from the site of the work and deposited in such areas as the CITY may directed or at locations selected by the CONTRACTOR with Approval of the CITY.
- G. Soft or disintegrated rock or hardpan which can be removed with a hand pick or power operated excavating machines, or loose of previously blasted rock, will not be considered as rock excavation.
- H. Before blasting commences, the CONTRACTOR shall uncover all ledge to be removed. Elevations shall be taken by the CITY Engineering Division. After completing rock removal, elevations shall be taken again by the surveyor. Amounts of ledge removed will be agreed to by CONTRACTOR and CITY.
- I. CONTRACTOR shall develop cross sections to show and determine rock quantities for payment purposes. Cross sections shall be reviewed by the CITY.
- J. Prior to blasting, the CONTRACTOR shall obtain written permission and approval of method from local or other authorities having jurisdiction before proceeding with the work. Explosives shall be stored, handled and employed in accordance with state and local regulations or, in the absence of such, in accordance with the provisions of the Manual of Accident Prevention in Construction of the Associated General CONTRACTORS of America, Inc.. In general, no blasting will be allowed within 100 feet of new construction or, in trenches, within 25 feet of laid utility piping. All blasting shall be well covered with heavy mats or timers chained together and the CONTRACTOR shall take great care to do no damage to existing buildings, foundations, and glazed areas. Any damage caused by the work of the CONTRACTOR shall be repaired to the full satisfaction of the CITY.
- K. Wherever rock is shattered below grade and is unfit for foundations, the shattered rock shall be removed and replaced as specified. No extra payment will be made for overbreak or backfill as required.

3.04 STRUCTURE FILL, BACKFILL AND COMPACTED FILL

- A. Fill, backfill and compact fills as necessary to complete the work, with suitable power equipment in accordance with the following, unless specifically indicated otherwise:
- B. Do not start work until fill material, fill areas, and equipment to be used in performing the work have been reviewed by the CITY and foreign materials have been removed.
- C. Loosen existing soil for a depth of 2" just prior to filling.
- D. Surfaces of new subgrades shall be left clean.
- E. Prior to placing fill, existing surface (subgrade) shall have been prepared as specified. When at proper moisture content, surface shall be compacted by rubber-tired roller compactor or drum type vibrator. Maximum thickness of layers measured before compaction shall be 8" for 10 wheel truck or rubber-tired roller compactor and 8" for drum type vibrator, or as otherwise specified. No fill

material shall be placed on frozen soil, nor shall snow, ice or frozen earth be brought in as fill. Fill material shall not be placed on material which has been affected by frost or moisture.

- F. No fill materials shall be placed and spread in area within which roller or 10 wheel truck is being operated for compaction. In large areas, fill material shall be placed and spread in layers prior to compaction which will permit orderly pattern for operating compaction equipment. Except as otherwise provided, surface of fill in reach being constructed shall be maintained approximately level.
- G. Placement of fill shall be done in a manner to prevent contamination of selected granular fill by less suitable material being hauled by, or placed adjacent to, building area.
- H. Acceptable on-site material and/or off-site borrow shall be placed in successive, even, horizontal layers to a depth no greater than 8" loose measure for fills within the building areas. Stones larger than 4" shall be removed prior to compaction of each lift. Areas around foundations, walls, or other restrictions which are inaccessible to roller-compactors, shall have granular fill placed in layers to a depth not than 6". Stones larger than 3" shall be removed prior to compaction.
- I. After each layer of fill has been spread, cleared of large stones, and inspected, lift shall be compacted by not less than 4 complete coverages with specified roller, to percent maximum dry density specified, as determined by laboratory tests in accordance with ASTM D 698-66, and field tests in accordance with ASTM D 1556-64.
 - 1. Fill under structure foundations, 95 percent.
 - 2. Fill under lawn and planted areas, 90 percent.
 - 3. Fills under surfaced areas: Floors, areaways, gutter curbs, parking areas, walls, walks, terraces, steps, etc., 95 percent.
 - 4. Top 2' of fill under roadways, 95 percent.
 - 5. Fills and backfills within 4' from outside of walls and fills not otherwise specified, 90 percent.
 - 6. In confined areas around piers, supports posts and adjacent to building foundation walls, where fill cannot be compacted by equipment described above, compaction shall be performed by hand-operated power driven vibratory plate compactors of acceptable type, upon material spread in 8" layers as described above. Compaction shall attain the same relative density of 95 percent, as specified.
 - 7. Backfill or fill around pipes using hand tools to a point of 12" above pipe. Compact remainder of such fills using small tools such as power-driven tampers and vibrators, to suit fill materials.

8. Keep power-driven, rider-operated spreading, compacting and other heavy equipment away from damaging in place structures, utilize temporary protection as required. Damaged structures, supports or other site improvements shall be reviewed by CITY, and manufacturer's representative if warranties from manufacturer cannot be maintained due to damages sustained. The CONTRACTOR shall replace damaged material with new at no extra cost to the CITY.
9. Where fill is placed around, or on, two sides of any structure, carry it up evenly. Avoid displacement or other damage to such structure.

3.05 COMPACTION EQUIPMENT

- A. CONTRACTOR shall use, for compaction of subgrade and fill in designated areas, equipment at number of coverages stipulated depending upon suitability of equipment for the work, as follows:
 1. Rubber-tired roller-compactor, having 4 wheels equipped with pneumatic tires of such size and ply as can be maintained at pressures between 80 and 100 psi with 25,000 lb. wheel load during rolling operation.

Roller-wheels shall be located abreast, and so designed that each wheel will carry approximately equal load in traversing over even ground. Spacing of wheels shall be such that distance between nearest edges of adjacent tires will not be greater than one-half width of one tire at operating pressure for 25,000 lb. wheel load.

Roller shall have body suitable for ballast loading such that load per wheel may be varied, if so directed, between 10,000 lb. and 25,000 lb. roller shall be towed at speeds not exceeding 20 miles per hour.
 2. Acceptable drum type vibratory compactor operating at not less than 2,000 vibrations per minute.
- B. In any event, regardless of equipment used, compaction of soil shall meet the relative densities stated in this sections.

3.06 PROJECT CONDITIONS

- A. "Dig-Safe" Damage Prevention System: All Contractors or Subcontractors performing drilling, boring, augering, jetting, sheeting or pile installation, demolition, excavation or like work shall, prior to commencement of these activities, contact utility companies having responsibility for underground transmission systems for information relative to locations of existing underground utilities and/or appropriate dig-safe damage prevention and notification agency.
- B. "OSHA" requirements shall be met and adequate protection measures shall be provided to protect workmen and pedestrians passing by the

site. Streets adjacent to the property shall be fully protected throughout the operations.

- C. Shoring, sheeting, and bracing and/or prefabricated trenching boxes shall be provided to prevent caving, erosion or gullyng sides of excavation.
- D. Provide for surface drainage and erosion control during the period of construction in a manner to avoid creating a nuisance to adjacent areas. Keep all excavations free of water during the entire progress of the work, regardless of the cause, source or nature of the water.

END OF SECTION

2023 CITY ROADWAY IMPROVEMENTS
BITUMINOUS CONCRETE PAVEMENT
AND SURFACE PREPARATION
SECTION 02600

SECTION 02600

BITUMINOUS CONCRETE PAVEMENT
AND SURFACE PREPARATION

PART 1.00 GENERAL

1.01 DESCRIPTION

A. Work included:

1. Provide all materials, equipment and labor necessary to furnish, place and compact bituminous concrete pavement as specified.
2. All work specified in this section shall conform to all applicable requirements for materials and construction methods of the Rhode Island Dept. of Transportation Standard Specifications for Road and Bridge Construction, Latest Edition.
3. Preparation of the sub-base, base and/or surface as specified or directed prior to placement of bituminous concrete pavement, cross slopes shall not be less than 1.5% nor greater than 3%.
4. Raise, adjust and/or protect all manhole covers, catch basins, water boxes and shut offs and any other utility surface structures as necessary. This service shall be included within the price bid for Bituminous Concrete. No additional payment shall be made for this service.
5. Saw cutting at driveways and match points, with adequate depth for new Asphalt to match existing to assure a smooth transition between joints
6. Apply water and/or calcium chloride to prevent dust from being a nuisance to the public and/or workers.
7. Cleanup shall occur within 14 days after the wearing course has been installed.
8. Contractor shall be responsible to provide a fresh, clean saw cut joint, just prior to installing hot mix asphalt, against existing pavement. This will include the contractor performing a saw cut and removal of key just prior to paving operations, performing a saw cut days prior to paving and removal of said saw cut just prior to paving, or saw cutting and removal of material and provide a ramp on fabric for easy removal just prior to paving operations.

B. Related Work Specified Elsewhere:

1. Earthwork Section 02200

C. Environmental Conditions

1. Bituminous plant mix shall not be placed on any wet surface or when the air temperature is below **38 degrees F.**, or when there is frost in the base, or when any other weather conditions prevent the proper handling or finishing of the bituminous mixtures.

PART 2.00 PRODUCTS

2.01 BITUMINOUS CONCRETE PAVEMENT

- A. Class 9.5 Wearing course mix constructed to the thickness specified and shall conform to the relevant provisions of Section M.03.01 of the Rhode Island Dept. of Transportation Standard Specifications for Road and Bridge Construction, Latest Edition.
- B. Modified Binder course mix constructed to the thickness specified and shall conform to the relevant provisions of Section M.03.01 of the Rhode Island Dept. of Transportation Standard Specifications for Road and Bridge Construction, Latest Edition.
- C. Base Course mix constructed to the thickness specified and shall conform to the relevant provisions of Section M.03.01 of the Rhode Island Dept. of Transportation Standard Specifications for Road and Bridge Construction, Latest Edition.
- D. Materials shall be batched or drum mixed at a State approved plant. Material may be subject to testing at an approved testing facility, at the expense of the City, to insure materials meet standards.

2.02 WATER

- A. All water used for dust control shall be reasonably clear and free of harmful amounts of oil, salt, acid, alkalies, sugar, organic matter or other substances injurious to plant life or the establishment of vegetation.

2.03 CALCIUM CHLORIDE

- A. Calcium chloride for dust control shall conform to AASHO M144.

PART 3.00 EXECUTION

3.01 PAVEMENT RECLAMATION

- A. This work shall consist of the rehabilitation of the existing pavement structure into a processed asphalt stabilized base (recycled) course. The existing pavement is to be mixed with a specified depth of the existing gravel base. This mixture of pavement and gravel is to be processed, blended, reshaped, rolled, compacted and fine graded in accordance with these Specifications and/or as directed. In areas where the contractor establishes new road grades, the contractor shall be solely responsible for the restoration at the direction of the City Engineer, including loaming and seeding, additional driveway cutbacks, etc.
- B. Reclaimed Base
All pulverized material shall pass the 3" sieve. The processed base

shall meet the following gradation:

<u>SIEVE SIZE</u>	<u>% PASSING</u>
3"	100
1 ½"	70-100
¾"	50-85
#4	30-55
#200	2-12

A grain size distribution test of the pulverized material shall be furnished upon request of the CITY.

- C. Reclamation will be by means of a traveling rotary reclaimer or equivalent machine capable of cutting through existing asphalt at depths up to 12 inches with one pass. The machine shall be self-propelled and equipped with an adjustable grading blade thus leaving its path generally smooth for traffic. Equipment such as road planers or cold milling machines which are designed to mill or shred the existing bituminous concrete rather than to crush or fracture it, are not considered capable of achieving specification gradation. The required and necessary action of the reclaimer will increase the percentage of fine aggregate. This machine is not intended for use on subbases with large boulders or ledge. Existing bituminous concrete and gravel base must be pulverized and mixed so as to form a homogeneous mass of uniformly processed base material which will bond together when compacted.
- D. Prior to the start of reclaiming operations, the Contractor shall locate and protect existing drainage, utility, and municipality structures, underground pipes, culverts, conduits, and other appurtenances. Where required structures shall be lowered to a minimum depth six (6) inches below the bottom of the proposed reclaimed base course. Lowered structures shall be covered with steel plates. The voids remaining after the structures have been lowered are to be filled with a suitable material. The Contractor will be responsible for the coordination with the respective utility companies for the lowering and re-raising of privately owned structures and gate boxes. The reclaiming operation shall not begin until all structures and boxes are lowered and adequately protected.
- E. The Contractor is responsible to maintain drainage functioning properly in the areas under construction up to the time when the final system is put to use including erosion controls within the catch basins.
- F. The existing pavement shall be saw cut full depth within the areas where the adjacent surface is to be protected as directed by the City.
- G. The existing road pavement, driveway aprons and underlying material shall be pulverized to a minimum 6" depth. The pulverization shall blend the asphalt and base material into a homogenous mass, utilizing the asphalt from the existing pavement as a stabilizer to bond the material together when compacted.

- H. Water and calcium shall be added to insure optimum moisture content at time of compaction. They shall be applied at the rate of 0.25 pounds of calcium chloride per gallon of water per square yard or recycled pavement area. The mixing formula may be modified by the Engineer to compensate for temperature, humidity, weather and/or density determinations.
- I. The reclaimed material shall be shaped and graded to the lines and grades as directed by the City and compacted to a dense consolidated mass by rolling with a roller weighing not less than fifteen (15) tons. The finished surface shall be tested for smoothness and accuracy of grade and if any portions are found to lack the required smoothness or accuracy, such portions shall be repulverized, reshaped, recompact and otherwise manipulated as the City may direct until the required smoothness and accuracy are obtained. The finished surface shall be such that it will not vary more than one quarter (1/4) of an inch from a ten (10) foot straight edge applied to the surface, parallel to or at right angles to the center line.
- J. Any required modifications to the remaining sub-base such as, but not limited to, cuts, fills, and grade realignment shall be made. Existing unsuitable material shall be removed to the lines and grades established by the City and replaced with a suitable material, as determined by the City. All driveways shall be accessible at the end of the day by either ramping material or other approved means.
- K. Should the grade of the existing roadway, after pulverization, yield excess materials, the Contractor shall remove, haul and dispose at the Forbes Street Landfill of all such material as directed by the City. The City reserves the right to change disposal locations.
- L. The City will establish such general reference points as in its judgement will enable the Contractor to proceed with the work. The Contractor, at his own expense, shall provide all materials and equipment and such qualified helpers as the City may require for setting the general reference points and shall protect and preserve all stakes, benches, and other markers used to identify the reference points. The Contractor shall lay out all the Contract work from the above and shall be responsible for the accuracy of all lines, grades and measurements.
- M. The Contractor shall reclaim only that area of roadway that can be processed and compacted by the end of the same working day, at which time it must be opened to traffic, with the City's approval.
- N. The Contractor shall pave the reclaimed roadway within seven (7) days after the commencement of the in-place recycling operations for each street. The CONTRACTOR must schedule the reclaiming and paving of the reclaimed roadway based upon weather forecasts.
- O. Streets scheduled to be improved through pavement reclamation operations are listed in Appendix A.

3.02 COLD PLANING

- A. The work shall consist of preparing a foundation for the placement of 1.5" to 2" of bituminous surface course Class 9.5 by the removal of existing material using approved cold planing methods and approved equipment.
- B. The equipment to be used for removing the bituminous surface shall be a power operated planing machine capable of removing, in one pass, a layer of bituminous material 3" in depth. The depth of asphalt to be removed shall be over the entire width of the road (curb to curb) or as directed.
- C. The equipment shall be capable of accurately establishing profile grades by referencing from either the existing pavement, or from an independent grade control, shall have a positive means for removing excess material from the surface and prevent any dust resulting from the operation from escaping into the air. Special size equipment may be required for pavement removal directly adjacent to curbing, chatter strip, drainage and utilities structures.

The equipment furnished by the CONTRACTOR shall be in good repair and shall be maintained so as to produce a clean cut to the pavement at all times. Signage shall be installed where vertical joints exist alerting traffic to the bump. The vertical joint shall be filled to decrease the bump height. A new joint shall then be saw cut just prior to paving operations.

- D. The planed surface shall conform generally to the grade and cross section required and be free from being torn, gouged, shaved, broken or excessively grooved. The surface shall be free of imperfections of workmanship that will prevent the surface from being resurfaced with new pavement following this operation. Surface texture shall be rough grooved, and in all cases shall be acceptable to traffic at the end of each day.
- E. No asphalt cuttings shall remain on the project site at the end of each work day. Asphalt cuttings loosened and directed for removal shall become the property of the CONTRACTOR and shall be disposed of off-site by the CONTRACTOR at no additional cost to the City.
- F. The CONTRACTOR shall supply a power sweeper to pick up any loose debris from planing and sweep the entire street after the cold planing has been completed. The CITY will not supply a sweeper where the cold planing process is underway.
- G. Care shall be exercised in planing adjacent to roadway joints, face of curbing, chatter strip and utility structures. Special size planing equipment may be required for these areas for removal of existing bituminous pavement to require depth and profile.
- H. The CONTRACTOR shall be responsible for the protection of and any adjustment required of utility structures during planing operations.
- I. Streets scheduled to be improved through cold planing operations are listed in Appendix B.

- J. The existing pavement shall be saw cut full depth within the areas where the adjacent surface is to be protected as directed by the City. The driveway aprons, first two feet from the gutter's edge, shall be removed after the milling operation has passed the driveways. Cutbacks shall be paved after the road is complete, but no longer than 48 hours after laying the wearing course.
- K. A leveling course shall be laid where directed by the City. The leveling course may be installed prior to or immediately before the surface course of hot mix is laid.
- L. The Contractor shall pave the planed roadway within seven (7) days after the commencement of the cold planing recycling operations for each street. The CONTRACTOR must schedule the cold planing and paving of the reclaimed roadway based upon weather forecasts.

3.03 ADJUSTMENT TO UTILITY STRUCTURES

- A. All utility gate boxes and curb stops shall be carefully loosened from the surrounding material and adjusted to the final grade. The CONTRACTOR shall then carefully refill around the gate box and curb stop and hand tamp the fill to provide dense compaction. A concrete collar shall be installed around each utility box. If a utility gate box or curb stop is damaged due to improper construction techniques, it will be the CONTRACTOR'S responsibility to supply and set in place a new gate box or curb stop box to the satisfaction of the Utility Company and the CITY at no additional cost.
- B. If a utility gate box has a riser in it, the riser shall be removed and the box adjusted to the final grade. In cases where raising a box is impossible, only risers approved by the City shall be used. City-owned gate boxes may be raised with approved risers only with the approval of the City.
- C. Manhole and Catch Basin castings shall be reset to the proper line and grade by the removal or addition of bricks and mortar. **Risers shall not be used.** Drainage grates shall not be more than 3/4" lower than the new surface. The new asphalt surface shall be tapered to allow for maximum surface run-off into basins. Areas around catch basins, manholes, shut-offs, etc. shall be left no lower than 3/4" at the end of each work day.
- D. Any bricks, mortar, debris or foreign matter associated with adjustment operations which may drop into a manhole, catch basin or valve box structure shall be removed immediately. The CONTRACTOR shall be held responsible for any interference in flow for failure to remove and clean structures of fallen debris.
- E. Upon completion of each structure, including water gate boxes, it shall be cleaned of any accumulations of silt, debris or foreign matter of any kind and shall be kept clear of such accumulation until final acceptance of the work.

- F. The CONTRACTOR must maintain access to all catch basins and utility manholes at all times during construction operations.

3.04 BITUMINOUS PAVEMENT

- A. Paving shall be accomplished in accordance with the State of Rhode Island Standard Specifications for Road and Bridge Construction.
- B. The surface shall be clean of all dirt, packed soil or any other foreign material and shall be dry when spreading the bituminous mixture. The mixture shall be spread in courses as specified and to the amount required to obtain the compacted thickness and cross section shown on the design drawings. All surfaces shall pitch to drain easily.
- C. Asphalt concrete shall be applied with an approved self-propelled paver equipped with a berm attachment (a self-propelled spreader box is not considered an approved paver). The mixture shall be spread so that the surface is smooth and true to cross section, free from irregularities and of uniform density throughout. Binder and wearing surface thickness shall be per the City Engineer.
- D. On areas where irregularities, unavoidable obstacles and driveways make the use of mechanical spreading and finishing equipment impracticable, the mixture shall be placed as close to its final position as possible. It shall then be spread, raked and luted by hand tools in a manner which will minimize segregation and result in the required compacted thickness. This is not applicable for driveway aprons which shall be paved during the roadway pavement. No joints will be allowed in the gutter line.
- E. Immediately after the bituminous mixture has been spread, struck off and surface irregularities adjusted it shall be thoroughly and uniformly compacted by use of power driven rollers, mechanically wetted and weighing not less than ten (10) tons or as approved by the CITY. Additional rolling by pneumatic tired roller shall be provided to finish all surface courses. The size and type of finish roller shall be as required and shall obtain the desired finishing product as determined by the CITY. Rolling shall proceed at uniform rate and continue until all roller marks, ridges, porous spots, and impressions have been eliminated; no further compression is possible; and the surface conforms with the specified lines and grades.
- F. Spreading by hand will be permitted in special patch areas (along curblines) provided that the material is immediately spread following delivery by means of hot shovels and hot rakes to uniform density and correct depth. If rolling is not practical, due to the proximity of curbstones, or other structures, the material may be compacted and the surface irregularities adjusted by use of mechanical tampers, hand tamping irons and hot smoothing irons. Any mixture that becomes loose and broken, mixed with dirt, or is in any way defective shall be removed and replaced with fresh hot mixture which shall be compacted to conform with the surrounding areas.

- G. CONTRACTOR shall sawcut driveways and match points at locations as directed by the CITY.
- H. The CONTRACTOR shall apply the final bituminous surface course over the bituminous binder within fourteen (14) days after the binder course was applied. The CONTRACTOR shall be responsible for applying an asphalt tack coat on the binder course. This tack coat will be applied at no cost to the CITY.
- I. Cross slopes of roads shall be a minimum of 1.5 % and a maximum of 3% and a 6-inch curb reveal shall be provided as part of the reclaiming, fine grading and pavement work unless otherwise directed by the CITY.
- J. A tack coat shall be applied to roadways requiring a 2-inch overlay.
- K. Driveway cutbacks shall be paved after the road is complete, but no longer than 48 hours after laying the surface course.

3.05 PATCHING

- A. Patching of all existing paving disturbed during the work shall be in accordance with the above specifications.
- B. All edges of existing paving to be matched shall be saw cut in accordance with Section 02200 and as detailed.

3.06 DUST CONTROL

- A. Either water or calcium chloride may be used for dust control as directed by the CITY. Dust control shall be the responsibility of the CONTRACTOR.

3.07 BITUMINOUS BERM

- A. Bituminous berm shall be installed per the standard detail in areas directed by the CITY. All areas behind the bituminous berm shall be loamed and seeded, the cost of which shall be included in the cost of the bituminous berm item (Item 18). The berm shall be installed at the same time as the top course of the roadway. The material cost shall be included in the cost of Bituminous pavement (item 1.a.). Item 18 shall be the cost to install the berm and restore the area adjacent to the berm.

3.08 GUARANTEE

- A. The CONTRACTOR shall maintain pavement under this contract during the guarantee period of one (1) year. Any ponding problems, cracking, etc.,
- B. that exist after the final surface course must be repaired/repaved by the CONTRACTOR by means of infrared technology leaving no seam at no cost to the CITY.

END OF SECTION

2023 City Roadway Improvements
Cold In-place Recycling ("CIR") Specification
Section 02612

Description

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

1. MATERIALS

a) **Reclaimed Asphalt Pavement (RAP) Material**

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

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

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

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

<u>Sieve Size</u>	<u>Percent Passing</u>
1 ½"	100
1"	95 to 100

b) **Stabilizing Agent (ITEM 3e)**

The asphalt stabilizing agent shall be Foamed Asphalt.

c) **Foamed Asphalt**

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

d) **Mineral Filler (ITEM 3f)**

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

e) **Water**

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

2. QUALITY MANAGEMENT PROGRAM

a) Personnel

Provide a qualified and certified technician for performance of field density.

b) Equipment

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

c) Quality Control (QC) Testing

- 1) Roadway production lots will be defined as 4000 lane-feet. Each roadway production lot will consist of two 2000 lane-feet sub lots.
- 2) Take roadway samples at a minimum frequency of 1 per lot of production.
- 3) For each roadway sample, report the gradation of material as determined by use of a rocker screen, or equal, for the 1" sieve and larger.
- 4) Report stabilizing agent foaming properties, if applicable, (i.e. half-life and expansion ratio) at a minimum frequency of 1 per lot of production.
- 5) Conduct and report density testing at a minimum frequency of 3 random tests per sub lot.
- 6) Conduct and report mill depth checks at a minimum frequency of 1 per sub lot.
- 7) Report stabilizing agent temperature and application rate at a minimum frequency of 1 per sub lot.
- 8) Provide a Daily Inspection Report to the Engineer summarizing the: daily beginning and ending stations, applicable mix design, sub lot test (mill depth check, density test, stabilizing agent temperature and application rate) locations and values, lot roadway sample locations, and any adjustments to the application rate of the stabilizing agent or water.
- 9) If stabilizing agent adjustments exceed the allowable limits defined in the mix design, or reduce the stabilizing agent application rate below the 1.5% mix design minimum specified in Table 2B, based on a single test or meter adjustment, re-evaluate the entire process. Obtain approval by the Engineer before resuming production.

d) Owner Testing

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

3. CONSTRUCTION

a) General

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

b) Equipment

- 1) Equipment used for CIR shall be subject to approval by the Engineer.
- 2) Tankers supplying hot stabilizing agent components shall be equipped to constantly monitor temperature within the tank.
- 3) Portland cement bulk spreader must be fully automated and capable of achieving the application rate specified in the mix design. Portland cement spreader shall also be equipped with a water misting spray bar to reduce the amount of airborne cement dust from the spreading operation.

c) Milling Machine

- 1) Utilize milling units not inclusive of pre-mill/wedge-cut milling units capable of milling the existing pavement full lane width (12'- 6" minimum) in a single pass to the depth shown on the plans, specified in the contract, or directed by the Engineer. The minimum mechanical power rating of this machine shall be 900 horsepower.
- 2) Utilize units equipped with automatic depth control that maintain constant cutting depth and width, uniform grade, and uniform slope.
- 3) For processes not incorporating additional screening, sizing, or crushing, utilize a down-cutting milling unit capable of producing RAP sized as specified in 2 (a).
- 4) Use of a heating device to soften the pavement is not permitted.

d) Asphalt Foaming and Mixing Unit

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

5) The foaming system must meet the following requirements:

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

e) **Paving Equipment**

- 1) The placement and shaping of the recycled pavement mixture shall be completed using a self-propelled paver, with a minimum 10' and maximum 20' screed width.
- 2) The screed shall not be heated when paving the recycled mix.
- 3) The material shall be transferred directly into the paver hopper from the recycling equipment.

f) **Compaction Equipment**

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

g) **Preparation**

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

h) **Processing and Placement of Recycled Pavement Mixture**

- 1) Mill the existing pavement to the required depth and width indicated on the plans.

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

i) **Compaction - Control Strip Construction**

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

j) **Compaction Requirements**

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

k) **Surface Requirements**

- 1) Test the pavement surface at regular intervals using a 10-foot straightedge or other Engineer-specified device.

- 2) The Engineer may direct the repair of surface deviations greater than 1/4 inch between two surface contact points. Correct high points by reworking, rerolling, trimming, milling, or grinding. Minor depressions greater than 3/4 inch may be corrected by reworking or have a tack coat applied and be filled with HMA immediately prior to placement of the surface treatment.

l) **Maintaining the Work**

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

m) **Keyways and Miscellaneous Milling as a Day Rate**

Cutting keyways and miscellaneous milling to provide a smooth transition from the new hot mix paving over the CIR layer to the existing pavement at side roads, intersections, project limits, etc. are to be performed by the paving Contractor at no expense to the owner.

n) **Curing and Surfacing**

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

o) **Down Time**

If Contractor's daily production is stopped due to no fault of its own (i.e. buried utility structures not identified,), the labor and equipment costs incurred during the delay period will be paid at the bid hourly rate (ITEM 3g).

4. **MEASUREMENT AND PAYMENT**

Table D.14

DESCRIPTION	UNIT
Cold In-place Recycling (CIR) Including Fog Seal	SY

Liquid Asphalt Stabilizing Agent	GAL
Portland Cement Stabilizing Agent	TON

- a) The Owner will measure the Cold In-place Recycling (CIR) bid item as acceptably completed by the square yard.
- b) The Owner will measure the Liquid Asphalt and Portland Cement Stabilizing Agents incorporated into the work by the gallon and by the ton, respectively, as metered through a calibrated pump, calibrated auger, or through delivered ticket quantity, acceptably completed.
- c) Payment is full compensation for measured quantities as specified above; all material including mixing and milling water; equipment necessary for milling and sizing, mixing, paving, compacting the completed CIR and fog seal to maintain the completed CIR.

5. METHOD OF AWARD

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

6. ASPHALT PRICING AND PRICE ADJUSTMENTS

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

ITEM 3b
Pre-Milling Pavement

1. DESCRIPTION

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

2. EQUIPMENT

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

3. CONSTRUCTION METHOD

- a) The cold planing machine shall be delivered to the project limits on a trailer. The machine shall be loaded on to the trailer to be transferred from work site to work site. The Owner shall not "walk" the machine to the next site unless prior approval from the Engineer is granted.
- b) Once the cold-planing process has begun, the contractor is obliged to carry this effort forward without interruption, yet in accordance with all work hour restrictions unless otherwise directed by the Engineer
- c) No asphalt millings shall remain on-site at the end of each day. Material resulting from the operation shall become the property of the Owner and disposed of at an Owner-furnished disposal site. Existing catch basins shall be protected in place to not allow loose material to enter structures.
- d) Contractor is required to provide trucking of pre-millings, it will be paid for under ITEM 2c – Removal and Delivery Existing Pavement and Earth Materials to the Forbes St Landfill.

4. METHOD OF AWARD

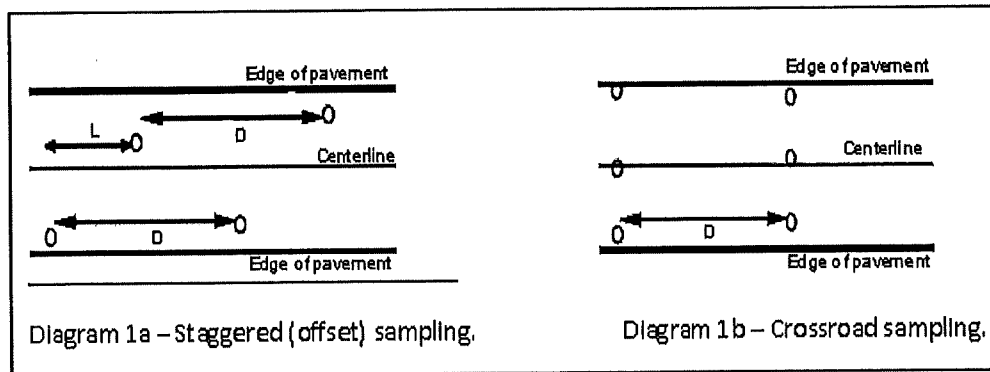
To ensure contractor accountability, the Owner intends to award all items to a single contractor. Accordingly, contractors must bid on all items of work, and the low bidder will be the contractor whose total bid price is the lowest. The bid quantities are not guaranteed, and their primary purpose is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

ITEM 3c Core Sampling

1. DESCRIPTION

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

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



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

D – 1 mile maximum

L – 0.5 mile maximum

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

Arterial and Industrial Streets

D – 2,000 feet maximum

L – 1,000 feet maximum

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

Residential Streets

- a) For streets less than 250 feet long, a minimum of one core when grouped with other streets to obtain the quantity of material required for mix design.
- b) For streets 250 feet to 500 feet long, a minimum of two cores when grouped with other streets to

obtain the quantity of material required for mix design (one within 3 feet of gutter, and the other within 3 feet of centerline).

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

2. FILLING SAMPLE HOLES

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

ITEM 3d Mix Design

1. MIXTURE DESIGN

- a) Obtain cored samples for the project mix design. Three hundred and fifty pounds (350 lbs.) of representative material to be recycled is required for each mix design.
- b) An independent laboratory not owned or controlled by the Contractor shall develop and submit a Job Mix Formula (JMF) prior to the start of the CIR operation. Develop the JMF conforming to the requirements of Table 2B below.

Table 2B – CIR Minimum Mix Design Requirements for Stabilizing Agents

Test Method	Specification	Criteria
Gradation of RAP (Sieve Analysis of Aggregates)	ASTM C117 and C136	1 ½" sieve-100% passing 1" sieve-95 to 100% passing
Bulk Specific Gravity of Compacted Samples	ASTM D6752 or D2726	Report Only; Ndes=30
Maximum Theoretical Specific Gravity	ASTM D2041	Report Only
% Air Voids		Report Only
Tensile Strength (Resistance of Compacted Mixture to Moisture): Dry, psi	ASTM D4867 Part 8.11.1, 25°C, psi	Minimum 45
Wet (conditioned), psi	Conditioned ITS, ASTM D 4867, psi	Minimum 30
RAP Coating Test	AASHTO T 59	Minimum Good
Minimum Virgin Asphalt Content		1.5%
Foamed Asphalt Expansion Ratio		Minimum 8.0 Times
Foamed Asphalt Half-life		Minimum 6.0 Seconds

- c) The lab equipment used to simulate the asphalt foaming process and RAP stabilization shall be substantially similar to the Contractor's recycling equipment to be used on the project.
- d) The mix design JMF shall be the baseline measure for the rate of stabilizing agent application and water blended with the RAP to construct the CIR mixture. The mix design shall indicate the allowable tolerance for field adjustments for the stabilizing agent and/or water so as not to jeopardize the performance of the mix in regard to Table 2B but allow the Contractor to adjust the mix in response to field conditions in consultation with the Engineer.

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

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

ITEM 21
Lowering and Raising of Existing Structures
(Frames and Grates or Frames and Covers)

1. MATERIALS

- a) Concrete collars will be constructed using 4,000 PSI cement concrete masonry or hot mix asphalt compacted in lifts not to exceed 6", at no additional cost. A minimum of four (4) inches of hot mix asphalt shall be placed around the adjusted structure and compacted to the underlying grade of the proposed wearing surface, and this work will be considered incidental to the above item's unit price. All concrete collars will be completely coated with (RS-1) asphaltic emulsion before placement of hot mix asphalt. The brick to be used shall be clay brick.
- b) Concrete collars shall be constructed with high early strength cement. Concrete collars shall be incidental to the item of work to which they pertain.
- c) Use of steel plates to cover open structures shall be considered incidental to the work and not cause for additional compensation. Multiple adjustments that may be necessary as a result of the work sequence shall be considered part of the one-time measurement and payment and not cause for additional compensation

2. ENGINEERING

- a) In all roadways, the castings shall be lowered to the top of the structure base.
- b) After the CIR, castings shall be raised to the final grade.
- c) Damaged or obsolete castings shall be replaced with new castings as directed by the Engineer. Frames, grates, and covers will be furnished by the Owner.
- d) The Contractor shall properly dispose of the old damaged or obsolete castings. No additional compensation will be made for disposal of the old castings.

ITEM 22
Structure Rebuild for every foot beyond the initial one foot.

ITEM 9
Adjustment of Existing Water Gates
and Other Small Structures (Box or Service)

1. CONSTRUCTION METHOD

- a) Valve boxes are to be lowered prior to the CIR process and raised after the CIR process. They shall be installed vertically, centered over the operating nut, and the elevation of the top shall be adjusted to final grade.
- b) Boxes shall be continuously and adequately supported during backfilling to maintain vertical alignment.
- c) Bricks shall be placed at the base of the flange to properly support the box.
- d) Backfill around valve boxes, and anywhere excavation is made in the street, shall be compacted in lifts not exceeding 6 inches.
- e) The boxes and tops shall be furnished by the Owner.
- f) The Contractor shall properly dispose of any old damaged or obsolete castings. No additional compensation will be made for disposal of old castings.

SECTION 02615

PAVEMENT MARKINGS, THERMOPLASTIC & EPOXY RESIN

PART 1.00 GENERAL

1.01 DESCRIPTION

- A. The work under this section shall include removing existing pavement markings and furnishing and applying a reflectorized oil and grease impervious thermoplastic road marking material which is hot extrusion applied with a surface application of glass spheres or an epoxy resin road marking material. The properly applied markings shall be reflectorized and able to durably resist degradation and deformation by traffic.

PART 2.00 PRODUCTS

2.01 MATERIALS

- A. The thermoplastic material shall be homogeneously composed of pigment, filler, resins, and glass reflectorizing spheres and shall be available in both white and yellow.
- B. The pigment, beads, and filler shall be uniformly dispersed in the resin. The material shall be free from all skins, dirt, and foreign objects and shall comply with requirements according to TABLE 1.

TABLE 1
COMPOSITION

<u>COMPONENT</u>	<u>BY WEIGHT</u>
Binder	18.0% Min.
Glass Beads (AASHTO M247 Type 1)	25.0% Min.
Titanium Dioxide (ASTM D476-Type 2)	8.0% Min.
Yellow (For Yellow Only)	2.0% Min.
Calcium Carbonate & Inert Filler	See Note

Note: Amount of Calcium Carbonate and inert fillers shall be at the option of the manufacturer, providing all other requirements of the specification are met.

- C. The binder shall be primarily composed of maleic-modified glycerol ester of resin and the binder shall not contain, oil and grease compatible, petroleum based hydrocarbon resins.
- D. The thermoplastic material after heating for four (4) hours at 425° and cooled at 77° shall meet the following color characteristics:

2023 CITY ROADWAY IMPROVEMENTS
PAVEMENT MARKINGS, THERMOPLASTIC & EPOXY RESIN
SECTION 02615
PAGE 2

WHITE: Daylight reflectance at 45° - 0°...75% Min.

YELLOW: Daylight reflectance at 45° - 0°...45% Min.
and match Federal Test Standard Number 595 - color
13538.

- E. When applied at a temperature range of 412° + 12.5° F and thickness of 0.125" the thermoplastic material shall set to bear traffic in not more than two (2) minutes when the air temperature is 50° F and not more than ten (10) minutes when the air temperature is 90°F.
- F. After heating the thermoplastic material for four (4) hours at 425°F the bond strength to Portland Cement concrete shall exceed 180 psi.
- G. For at least ninety (90) days after application the material shall show no cracks other than with substrate cracking.
- H. The solid block material shall be packaged in suitable corrugated containers, 14" x 28" x 3" in size weighing approximately 50 pounds, which will not adhere to material while in storage. Each batch shall designate the color, manufacturer's name, batch number and date of manufacture. Each batch manufactured shall have its own separate number. The label shall warn the user that the material shall be heated in the range of 400° - 440°F during application.
- I. Properly formulated oil impervious thermoplastic will, when 100 grams of a sample is melted and mixed thoroughly with 10 grams (10%) of Quaker State non-detergent motor oil to approximately 425°F remain hard after cooling and show definite separation of the oil as a distinct layer on top of the cooled thermoplastic.

2.02 EPOXY RESIN PAVEMENT MARKINGS

- A. General. The two-component, 100 percent solids paint shall be formulated and designed to provide a simple volumetric mixing ration (e.g., 2 part component A to 1 part component B) specifically for service as a hot-spray applied binder for glass beads in such a manner as to produce maximum adhesion, friction and reflection. The material shall be composed of epoxy resins and pigments only and meet the following requirements:

- 1. Color. White - the color (after drying at the specified thickness) shall be a flat white, free from tint, furnishing good opacity and visibility under both daylight and artificial light, and shall match Chip No. 17875 of Federal Standard 595.
Yellow - the color (after drying at the specified thickness) shall match Chip No. 13538 of Federal Standard 595.

The paint shall be well mixed in the manufacturing process and shall be free from defects and imperfections that may adversely affect the serviceability of the finished product. The paint shall not liver, thicken, curdle, gel, settle excessively, or otherwise display any objectionable properties

after storage. Individual components shall not require mixing prior to use when stored for a maximum of twelve months.

2. Composition. The overall paint composition shall be left to the discretion of the manufacturer, but shall meet the following requirements.

White:	Titanium Dioxide	20+/- 2 percent, by weight
	ASTM D476 Type III	
	Epoxy Resin	80+/- 2 percent, by weight
Yellow:	Chrome Yellow	25+/- 2 percent, by weight
	ASTM D211 Type III	
	Epoxy Resin	75+/- 2 percent, by weight

3. Epoxy Content (Component A). The epoxy content of the epoxy resin will be tested in accordance with ASTM D1652 and calculated as the weight per epoxide equivalent (WPE) for both white and yellow.

The epoxy content will be determined by a pigment free basis. The WPE shall meet a target value provided by the manufacturer within a tolerance of +/- 50.

4. Amine Value (Component B). The amine value shall be tested in accordance with ASTM D2074 to determine its total amine value. The total amine value shall meet a target value provided by the manufacturer within a tolerance of +/- 50.

The manufacturer may specify an alternate test method for determining the amine value subject to the approval of the Engineer.

5. Toxicity. Upon heating to application temperature, the material shall not exude fumes which are toxic or injurious to persons or property. A certification stating such is required to be submitted to the Engineer.
6. Abrasion Resistance (ASTM D4060). When the abrasion resistance of the material is tested with a CS-17 wheel under a load of 1,000 grams for 1,000 cycles, the wear index shall be no greater than 82.
7. Hardness (ASTM D2240). The Type D durometer hardness of the material shall not be less than 75 nor more than 100 after the material has been conditioned for not less than 72 hours nor more than 96 hours at 23degrees +/- 2 degrees C.
8. Tensile Strength (ASTM D638). The tensile strength of the material shall not be less than 6,000 psi after 72 hours of conditioning at 23+/-2 degrees Celsius.
9. Compressive Strength (ASTM D695). The compressive strength of the material shall not be less than 12,000 psi after 72 hours of conditioning at 23+/- 2 degrees Celsius.

10. Infrared Spectrophotometer Analysis (ASTM D2621). Samples of both Part A and Part B (and of that mixed to the proper ratio) shall be analyzed by infrared spectrography. The spectrum of each component and final product shall be a reasonable match to the spectrum of the original formulation submitted by the manufacturer.
 11. Directional Reflectance (ASTM E1347). The daylight directional reflectance (without glass spheres) shall be not less than 84 percent for white and not less than 50 percent for yellow (relative to Magnesium Oxide).
 12. Dry Time - Laboratory (ASTM D711). The epoxy resin compounds, when mixed in the proper ratio and applied to a uniform wet film thickness of 20 mils and immediately dressed with glass beads at the proper rate, shall exhibit a no-tracking drying condition in not more than 30 minutes at 72 degrees F.
 13. Dry-Time - Field. The no-tracking condition for the field shall be considered as the condition where no visual displacement of the epoxy resin striping material is observed
- B. Certification. The manufacturer shall furnish a certified test report by an independent testing laboratory prior to the start of the work indicating that the material as specified has been tested in accordance with the above procedures and that the results comply with the above requirements. A Material Safety Data Sheet is also required.
- C. Packaging. The epoxy materials shall be shipped in appropriate, durable, and substantial containers. Individual containers shall be plainly marked with the following information: manufacturer's name and address; name of product; lot number; batch number; color; net weight and volume of contents; date of manufacture; date of expiration; statement of content (i.e., Part A-contains pigment and epoxy resin; Part B - contains catalyst); mixing proportions, application temperatures and instructions; and safety information.

2.03 GLASS BEADS - DUAL GRADATION

- A. Scope. This specification covers the requirements for glass beads which are to be dropped onto white and yellow epoxy resin pavement marking material to produce a highly weather-and-wear resistant reflectorized traffic marking.
- B. Detailed Requirements.
1. reflective Glass Spheres. The glass spheres shall be transparent, clean, smooth and spherically shaped, free of milkiness, pits, or excessive air bubbles and conform to the following specific requirements.
 - a. Coatings. The spheres shall be coated to enhance their embedment characteristics to the binder. They shall show no

tendency to absorb moisture in storage and shall remain free of clusters and hard lumps.

b. Quality Assurance. The spheres shall be segregated into maximum lots of 2,500 pounds and lot numbers shall be stamped onto each. Each lot shall be tested for gradation, rounds and coating and a Certificate of Compliance stating such will accompany each lot.

c. Gradation. The glass spheres shall meet the following gradation requirements when tested in accordance with ASTM D1214.

Type I		Type II	
Sieve Size	Percent Passing	Sieve Size	Percent Passing
10	100	20	95-100
12	95-100	30	80-95
14	80-95	50	9-42
16	10-40	80	0-10
18	0-5	-	-
20	0-2	-	-

d. Roundness. The glass spheres shall have a minimum of 80 percent rounds per screen for the two highest sieve quantities for Types I and II, and no more than 3 percent angular particles per screen for the Type I gradation. The remaining fractions shall typically be no less than 75 percent rounds as tested according to ASTM D1155, Procedure A.

e. Refractive Index. The glass spheres shall have a refractive index of 1.50 to 1.52 when tested according to AASHTO M247.

f. Silica Content. The silica content of the glass spheres shall not be less than 60 percent.

g. Packaging. Reflective glass spheres shall be shipped in moisture resistant bags. Each bag shall be marked with the name and address of the manufacturer, the name and net weight of the material, batch or lot number, and shall include a certified test report stating that they meet the above test requirements.

PART 3.00 EXECUTION

- A. The thermoplastic material shall readily be applicable at temperatures between 400° and 440°F from the approved equipment to produce a 0.090" cross section of line at varying width in yellow or white as shown on the plans.
- B. Equipment supplies shall consist of a completely enclosable steel mobile trailer containing a thermoplastic applicator equal to Pave-Mark Corporation's Apollo System II Plus 1, a spare propane gas bottle, spare tire, 4" and 12" width extrusion dies and a variable

width bead dispenser.

- C. The approved thermoplastic applicator must be capable of thermostatically melting and properly applying at least 175 lbs. of thermoplastic material per hour without the use of a separate melting kettle. A block thermoplastic material preheater shall be quick mountable at an 82° vertical angle on the applicator to rapidly melt material. The material discharged into the extrusion die shall be heated by means of a covered radiant heater. Torch flame heating the die is unacceptable.
- D. The CONTRACTOR shall supply a minimum of 100 pounds of, AASHTO M-247, drop-on beads for each ton of thermoplastic material purchased. The glass bead dispenser shall be automatically operated only by the extrusion die control handle. The knurled bead shaft shall not rotate more than one-half inch wider than the thermoplastic line width in order to conserve material.
- E. Any existing pavement marking consisting of thermoplastic and/or paint must be removed from the roadway surface within the project area prior to application of any new striping using a pavement marking removing technique approved by the CITY.

3.01 EPOXY RESIN PAVEMENT MARKINGS

- A. Equipment - Equipment for the application of epoxy resin traffic stripes or special handwork shall consist of one or more mobile, truck-mounted and self-contained pavement marking machines, specifically designed to apply epoxy resin striping material and reflective glass beads in continuous and skip-line patterns. The equipment shall be capable of applying straight and curved lines in a true arc. In Addition, the truck mounted unit shall be provided with accessories to allow for the marking of legends, symbols, crosswalks, and other special patterns. At any time throughout the duration of the project, the Contractor shall provide free access to the equipment for inspection by the Engineer. The Engineer may approve the use of portable applicator in lieu of mobile truck mounted accessories for use in applying special markings only, provided such equipment can demonstrate satisfactory application of reflectorized epoxy markings in accordance with these specifications.

The application equipment shall be capable of installing a minimum of 10 miles of epoxy reflectorized pavement markings in an eight hour day and shall include the following features:

1. Individual material reservoirs for the storage of each of the individual epoxy resin components and each type of glass beads.
2. Heating element of sufficient capacity to maintain the individual epoxy resin components at the manufacturer's recommended temperature for spray application.
3. Two separate gravity type glass beads dispensers capable of

uniformly applying glass beads to epoxy resin traffic stripes at the rate required.

4. Accurately calibrated, tamper-proof, metering type device to monitor the ratio of the components being fed to the spray nozzle. The devices should be visible to the operator while the equipment is in use and can be capable of displaying the proportioning such that the actual mixing ratio can be determined at all times.

5. Accurately calibrated, tamper-proof, metering type devices that measure and record the number of gallons of epoxy resin material used and corresponding length of stripe(s) applied. Each application gun shall have individual footage accumulators which are activated only when material is being applied. This information shall be provided in a format that permits a direct determination of the yield (average mil thickness) of the applied materials.

6. All applicator guns on the spray carriages shall be in full view of the operator during operation. The equipment shall be capable of placing two lines simultaneously with either line a solid or intermittent pattern on yellow or white. When the color of the material is changed, a quantity of material equal 150 linear feet of stripe(s) shall be wasted to eliminate the chance of contamination of the alternate color.

7. An air pressure nozzle shall be directed to the area to be striped to permit cleaning of the road surface immediately prior to application of the material. The pressure in the line shall be a minimum of 175 psi.

8. When working on a roadway with more than one lane in either direction, the applicator truck shall have a permanently mounted, variable direction, illuminated arrow board, fully operational and visible to approaching traffic.

- B. General. Before any pavement marking work is begun, a schedule of operations shall be submitted for the approval of the Engineer. At least 5 days prior to the starting of striping, the Contractor shall provide the Engineer with the epoxy manufacturer's written instructions for use, including but not limited to, material mixing ratios and application temperatures.

When pavement markings are applied under traffic flow conditions, the Contractor shall provide all necessary signs, cones, arrow boards, etc., in accordance with the contract provisions and the latest edition of MUTCD to maintain and protect the traffic, the marking operation, and the pavement markings until thoroughly set.

If, for any reason, it is not possible to place epoxy lane and center lines within the guidelines and restrictions of the contract, and no previous lines exist, the Contractor, at his expense, shall place the appropriate color of four-inch reflective temporary pavement markings for the entire length of the roadway that is unstriped in accordance with the latest edition of the MUTCD. The temporary pavement markings and possible subsequent removal shall be

at the Contractor's expense. The type of temporary markings will be approved by the Engineer.

The Contractor shall be responsible for removing, to the satisfaction of the Engineer, all tracking marks, spilled epoxy markings applied in unauthorized areas.

- C. Power Wash. All special patterns, handwork, and oil or other deleterious substances shall be removed by a power wash machine with a pressure of 1400-2800 psi with the water heated to 180-195 degrees F. No chemicals shall be added to the water in the process. The machine will be equipped with a turbo blast tip with oscillating head and shall be capable of supplying 5 gallons/minute/gun.

Pavement cleaning shall consist of at least a brushing with a rotary, non-metallic broom and additionally as may be recommended by the manufacturer, all to the satisfaction of the Engineer. New Portland cement concrete shall be cleaned by sandblasting to remove any surface treatments and/or laitance. Surface cleaning and preparation work shall be performed only in the area of the epoxy markings applications. The pavement surface shall be air-blasted to remove dirt and residues just prior to the application of the markings.

1. Restrictions. Epoxy striping material shall be applied to substantially dry pavement surfaces. The pavement surface temperature and the ambient temperature shall be a minimum of 35 degrees F. at time of application. Operations shall neither start nor be continued during periods of rain or in the case of damp pavement. Operations shall not continue until the Engineer determines that the roadway surface is dry enough to achieve adhesion.

The individual epoxy components shall be heated to the temperatures recommended in the epoxy manufacturer's written instructions for use or as stated in the FHWA Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (note maximum temperature of 140 degrees F.)

The ratio of the two components shall be monitored during the application, using the installed metering devices. Should the ratio fall outside the range of +/- 5 percent of the manufacturer's specified mixing ration for over 30 seconds or at any time fall outside the range of +/- 10 percent, the application shall be stopped and the cause of the problem determined and corrected before proceeding.

2. Application. Epoxy pavement markings must be reflectorized for night visibility by adding reflective spheres before the paint dries or sets, by the double-drop method. The reflective spheres, Type I followed immediately by Type II, shall be evenly dispersed on a minimum wet film thickness of 20 mils on existing and new pavements at a minimum rate of 12 pounds per gallon for each type of glass sphere. All special patterns and handwork (i.e., stop bars, arrows, legends, symbols, etc.) shall meet the above application

rates with the following exception: The double-drop application of glass spheres will use the Type II gradation only with two applications at a minimum of 12 pounds per gallon each

The Contractor shall place necessary spotting at appropriate points to provide horizontal control for striping and to determine necessary starting and stopping points. Longitudinal joints, pavement edges and existing markings shall serve as horizontal control when approved by the Engineer.

Epoxy reflectorized pavement markings shall be placed at the width, thickness, and pattern designated by the Contract Documents. Marking operations shall not begin until applicable surface preparation work is completed and approved by the Engineer, and the atmospheric conditions and pavement surface temperature are acceptable to the Engineer. The temperature of the mixed epoxy may be adjusted as required for prevailing conditions, including air temperature and pavement temperature to achieve the prescribed no-track time. The speed of the applicator truck shall not exceed the recommended rate for the combination of the truck rate, pressure in the lines, and the tip opening and height of the spray gun to insure the required thickness.

- D. Quality Assurance. A tolerance of $\frac{1}{4}$ -inch under or over the specified width will be allowed for striping provided the variation is gradual and does not detract from the general appearance. Alignment deviations for the control guide shall not exceed 2 inches provided the variation is gradual and does not detract from the general appearance. Material shall not be applied over a longitudinal joint. Establishment of these tolerances shall not relieve the Contractor of his responsibility to comply as closely as practicable with planned dimensions.

Retroreflection shall be measured using a 30-meter geometry portable unit following ASTM D6359 with the following exceptions: minimum values shall not be less than 350 mcd/lum/m² for white and 225 mcd/lum/m² for yellow as measured by the Engineer; and measurement for acceptance shall be performed between 14 and 60 days after placement.

Epoxy reflectorized pavement markings, which after application and curing are determined by the Engineer to be defective and not in compliance with this Specification, shall be repaired. Repair of defective markings shall be the responsibility of the Contractor and shall be performed to the satisfaction of the Engineer at no additional cost to the City. Repair methods shall be detailed and submitted for approval to the Engineer prior to corrective action.

- E. Symbols and Word Messages. Symbols and word messages shall be applied to the pavement where designated on the Plans or as directed by the Engineer. The letters shall be elongated in the direction of traffic as shown on the Plans or as directed by the Engineer.

F. Epoxy Retroreflection Values. Payment will be as follows:

1. Minimum 350/225 (white/yellow): 100% contract unit price
2. Minimum 330/205 (white/yellow): 90% contract unit price
3. Minimum 310/185 (white/yellow): 80% contract unit price
4. Minimum 300/175 (white/yellow): 75% contract unit price
5. Below 300/175 (white/yellow): 0% contract unit price

END OF SECTION

2023 CITY ROADWAY IMPROVEMENTS
RESETTING GRANITE CURB
SECTION 02621

SECTION 02621

RESETTING GRANITE CURB

PART 1.00 GENERAL

1.01 DESCRIPTION OF WORK

- A. Provide all materials, equipment and labor necessary to complete the work as indicated on the drawings or as specified herein.
- B. This work shall consist of resetting of existing granite curb where designated on the plans, in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans or established by the CITY.

PART 2.00 EXECUTION

2.01 SALVAGE OF CURBING

- A. The CONTRACTOR shall carefully remove, store and clean any curbing specified for resetting, including the removal of curb lock material. The CONTRACTOR shall replace any existing curbing that is to be reset which is lost, damaged or destroyed as a result of the CONTRACTOR'S operations or failure to store and protect the curbing in a proper and acceptable manner.

2.02 EXCAVATION AND INSTALLATION/RESETTING

- A. Excavation shall be made to a sufficient depth and width in order to install the curb to the proper line and grade.
- B. All soft and unsuitable material shall be removed and replaced with suitable material at the direction of the CITY.
- C. All base material shall be thoroughly compacted to a firm, even surface. All materials under the curbing shall be carefully and thoroughly rammed in order to support the curbing properly for the entire length of each piece.
- D. After curbing has been set to the proper line and grade, clean backfill material shall be placed in 6" to 8" layers and thoroughly compacted to the satisfaction of the CITY.
- E. Backfill shall include placing material on the backside of the curbing, approximately 8± inches wide. The material shall be graded or sloped to prevent someone from tripping.
- F. Where specified, granite curb may be saw cut to meet the proper line and grade.

- G. The CONTRACTOR shall place asphalt where existing asphalt pavement was disturbed by resetting the curb. Loam and seed shall be placed where existing ground was disturbed. This work shall be considered a cost incidental to resetting the curb and compensation shall be included under the bid price for resetting granite curb in the proposal

END OF SECTION

SECTION 02625

CURB INSTALLATION

PART 1.00 GENERAL

1.01 DESCRIPTION OF WORK

- A. Provide all materials, equipment and labor necessary to properly install, curbing in accordance with the specifications included herein.
- B. This work shall consist of supplying City of East Providence Standard granite curb where required, transporting materials, excavating, setting of curb to line and grade, backfilling, compaction, grading, placement of temporary asphalt pavement and cleaning up the work area.

PART 2.00 MATERIALS

- A. All granite curbing, straight, radii, transitions, returns and granite inlet stones shall be furnished by the CONTRACTOR. All necessary transportation of materials shall be furnished by the CONTRACTOR at no additional cost to the CITY.

PART 3.00 EXECUTION

- A. Excavation shall be made to a sufficient depth to allow for a gravel base. The base shall be mechanically or hand tamped to a compaction of 95% of maximum density before any curbing is installed. All materials such as inorganic matter, roots, leaves, frost, ice or other materials which are deemed unsuitable by the CITY shall be removed and replaced with suitable gravel. All materials under curbing shall be carefully and thoroughly rammed in order to support the curbing properly for the entire length of each piece.
- B. The curb shall be set so that the front top axis line conforms to the line and grade required. The gravel base upon which the curb is to be set shall be compacted to a firm, even surface.
- C. Curbing shall be laid with joints as narrow as possible.
- D. Where specified, curb may be cut to meet the proper line and grade.
- E. After curbing has been set to the proper line and grade, clean backfill material shall be placed in 6" to 8" layers and thoroughly compacted to the satisfaction of the City Engineer. Additional backfill materials shall be provided as needed at no extra cost to the CITY including curb lock.
- F. Backfill shall include placing material on the backside of the curbing approximately 8" wide; material shall be graded or sloped to prevent someone from tripping or falling.

- G. The area of excavation on the front side of the curbing shall be backfilled with a gravel base thoroughly compacted and shaped to the required grade to allow for the placement of a 2 inch course of Type I-1 bituminous concrete pavement (temporary pavement patch). Temporary pavement shall be finished flush with the top of adjacent undisturbed pavement.
- H. CONTRACTOR shall maintain the temporary pavement for a minimum period of 90 days or until the roadway is repaved.

PART 4.00 NOTIFICATION

- A. The CONTRACTOR shall notify the Engineering Division by telephone or in person, twenty-four (24) hours prior to the start of curb installation work.

PART 5.00 MISCELLANEOUS

- A. The installation of curb during rainy days will not be allowed. If the CONTRACTOR is working in the CITY and it begins to rain, the CONTRACTOR will be allowed to complete the job in progress or shutdown and cleanup to the satisfaction of the CITY. No further work for that day will be permitted.
- B. All labor and materials furnished shall be guaranteed by the CONTRACTOR for a period of one (1) year following installation. Said guarantee shall cover settlement of curbing, damage to the curbing due to negligence by the CONTRACTOR, correction of defective work and any disintegration, crumbling or spalling of concrete curb.

END OF SECTION

2023 CITY ROADWAY IMPROVEMENTS
CONCRETE SIDEWALKS
SECTION 02630

SECTION 02630

CONCRETE SIDEWALKS

PART 1.00 GENERAL

1.01 DESCRIPTION

- A. The CONTRACTOR shall furnish materials, equipment, labor and all incidental items necessary to install Portland cement concrete sidewalks in accordance with the Contract Documents. Such work includes but is not limited to the following:
1. Removal of existing sidewalk, cement concrete, hot mix asphalt and unimproved sidewalk areas consisting of soil.
 2. Subgrade preparation
 3. Gravel base course
 4. Form work
 5. Concrete mixing, placing, finishing and curing
 6. Control and isolation joints
 7. Reinforcing
 8. Saw cutting existing concrete sidewalk.
- B. Related Work Described Elsewhere:
1. Earthwork - Section 02200.
- C. Environmental Conditions
1. The CONTRACTOR, at all times during and immediately after placement, shall protect the concrete from adverse affects of rain.
 2. Concrete shall not be placed when the air temperature is below 35°F or above 90°F.

PART 2.00 PRODUCTS

- A. Portland cement concrete shall meet the requirements of Section 601 for Class A concrete and Section M.02, as applicable, of the Rhode Island Dept. of Transportation Standard Specifications for Roads and Bridges, latest Edition. Concrete mixes shall be subject to inspection and test at the mixing plants for compliance with quality requirements.
- B. Reinforcing shall be molded steel wirefabric conforming to ASTM Standard Specifications for "Welded Steel Wire Fabric for Concrete Reinforcement", Designation: A 185-69. Wire shall be #10 gauge in 6" x 8" mesh.

- C. Preformed joint filler shall be an asphalt impregnated type approved by the CITY.
- D. Gravel Borrow Subbase shall meet the gradation requirements of Column I, Table I in subsection M.01.09 of the Rhode Island Dept. of Transportation Standard Specifications for Road and Bridge Construction, latest Edition.
- E. All other materials not specifically described but required for the complete and proper installation of the Portland cement sidewalks shall be as selected by the CONTRACTOR, subject to the approval of the CITY.

PART 3.00 EXECUTION

- A. The CONTRACTOR shall remove and dispose of any existing sections of cement concrete, hot mix asphalt or earthen sidewalks designated for replacement as specified and/or designated by the CITY. Excavation shall be made to the required depths and widths as shown on the detail or designated by the CITY. No trees shall be removed unless designated by the CITY.
- B. The removal and disposal of all excavated material from the work site shall be the responsibility of the CONTRACTOR.
- C. Where a newly constructed sidewalk abuts an existing sidewalk, the existing sidewalk shall be cut with a concrete saw only. The concrete saw shall conform to Subsection 501.03.20 of the Rhode Island Dept. of Transportation Standard Specifications for Road and Bridge Construction, latest Edition.
- D. The foundation shall be shaped and compacted to a firm even surface conforming to that shown on the CITY Standard Detail. All soft and yielding material shall be removed and replaced with acceptable material.
- E. The gravel base shall be placed in layers not over 6 inches in depth and compacted to the specified depth below finish grade.
- F. Forms shall be of wood or metal and shall extend for the full depth of the concrete. All forms shall be straight, free from warp and of sufficient strength to resist the pressure of the concrete without springing. Bracing and staking of forms shall be such that the forms remain in both horizontal and vertical alignment until their removal.
- G. The foundation shall be thoroughly moistened immediately prior to the placing of the concrete. The proportioning, mixing and placing of the concrete shall be in accordance with the requirements for the class of concrete specified.
- H. In sidewalk area, the concrete shall be placed to a thickness of 4-inches. In driveway areas and wheelchair ramps, the concrete shall be placed to a thickness of 6-inches with wire mesh. Mesh shall be placed no less than 2" and no more than 3" from the bottom of the

slab.

- I. The surface shall be broom finished. No plastering of the surface will be permitted. All outside edges of the slab and all joints shall be edged with a 1/4 inch radius edging tool.
- J. Expansion joints shall be of the dimensions specified, and shall be filled with the type of premolded expansion joint filler noted. The sidewalk, where required, shall be divided into sections by dummy joints formed by a jointing tool or other acceptable means as directed. These dummy joints shall extend into the concrete for at least 1/3 of the depth and shall be approximately 1/8 inch wide.

Construction joints shall be formed around all appurtenances such as manholes, utility poles, etc., extending into and through the sidewalk. Premolded expansion joint filler 1/4 inch thick shall be installed in these joints. Expansion joint filler of the thickness indicated shall be installed between concrete sidewalks and any fixed structure such as a building or bridge. This expansion joint material shall extend for the full depth of the walk.

- K. Concrete shall be cured for at least 72 hours. Curing shall be by means of moist burlap mats or by other approved methods. During the curing period all traffic, both pedestrian and vehicular, shall be excluded. Vehicular traffic shall be excluded for such additional time as the CITY may direct.
- L. The CONTRACTOR shall place asphalt as needed to match new sidewalks at driveway aprons. Loam and seed shall be placed where existing ground was disturbed by placement of concrete forms.
- M. Before final acceptance the CONTRACTOR shall remove all rubbish, excess materials, temporary structures, equipment, etc. to the satisfaction of the CITY. All parts of the work shall be left in an acceptable condition. Loam and seed shall be installed within 14 days of pouring the cement concrete.
- N. The CONTRACTOR shall maintain all work done under this contract for a period of one (1) year from the date of final acceptance.
- O. Tree pits shall be allowed for during reconstruction of the sidewalk at sites of existing street trees. The pits shall be 3' X 4' in size or equal in size to existing tree pits outside, but in close proximity to the construction area.
- P. Appendix D of these documents provides the list of streets which are to receive a sidewalk handicap access ramp constructed in accordance with these Specifications. Exact locations shall be directed in the field by the CITY.

END OF SECTION

2023 CITY ROADWAY IMPROVEMENTS
MISCELLANEOUS WORK AND CLEANING UP
SECTION 02989

SECTION 02989

MISCELLANEOUS WORK AND CLEANING UP

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. Work Included:

Furnish all labor, materials, equipment and incidentals required to do all miscellaneous work and cleaning up not otherwise specified. The work of this Section includes, but is not limited, to the following and all cleanup shall occur within 14 days of wearing course installation:

1. Driveways shall be made accessible at the end of each work day. Any extra work required to accomplish this shall be included in this item.
2. Provide access for mail delivery on a daily basis.
3. Provide access for trash pickup. CITY shall provide pickup schedule so that work does not conflict with trash vehicles.
4. Restoration, repair or replacement of existing catch basins, sewer manholes, sewer and drainage pipe, water and sewer services encountered during construction.
5. Restoration of concrete walks, driveways, fences, walls, mailboxes, signs, etc., as required.
6. Installation of erosion control measures and continued maintenance for the duration of the Contract.
7. Restore grass areas with loam and seed. Backing up edge of road shall take place within 5 days of paving the road.
8. Cleaning up the construction site.
9. Providing and setting up of temporary Fluorescent Traffic Cones (RIDOT Std. 26.1.0) and or Polyethylene Drums with markings around the work zones during construction operations and overnight.
10. Maintaining the safe passage of traffic in accordance with Section 01570, Traffic Control.
11. All water gate boxes shall be cleaned out using a vacuum and a key shall be placed on the valve nut in the presence of Water Utilities Supervisors to assure proper cleaning has taken place. Failure to do so will delay in final payment.
12. This includes the contractor being responsible to post no

parking signs and distributing notice of work letters to residents around the area of work, 48 hours prior to commencing work.

13. All other work incidental to completing the project.

PART 2.00 - PRODUCTS

None this Section

PART 3.00 - EXECUTION

3.01 CLEAN UP

- A. The Contractor shall remove all construction material, excess excavation, equipment or other debris remaining on the job as a result of construction operations and shall render the site of the work in a neat and orderly condition at least equal to that which existed prior to the start of construction within 14 days of wearing course installation or payment may be delayed.
- B. The Contractor shall remove all material from the water gate boxes with the use of an appropriate vacuum. The Contractor shall install a key on the valve nut in the presence of a Water Utilities Supervisor to assure the box has been cleaned appropriately. Failure to do so will result in delay of payment.

END OF SECTION

SECTION 03401

PRECAST CONCRETE SECTIONS

PART 1.00 - GENERAL

1.01 SCOPE OF WORK

- A. The CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to install all precast manholes, catch basins, drain structures and appurtenances and shall remove and dispose of existing manholes that are to be replaced.
- B. Related Work Described Elsewhere:
 - 1. Masonry for Miscellaneous Work - Section 04200
 - 2. Miscellaneous Metals - Section 05500

PART 2.00 - PRODUCTS

2.01 MATERIALS AND DESIGN

- A. Precast manholes and catch basins shall conform to ASTM Designation C478 and meet the requirements and dimensions as shown on the drawings.
- B. Drain manholes and structure shall have a brick paved shelf and invert, constructed to conform to the size of pipe and flow at changes in direction. The invert shall be laid out in curves of the longest radius possible tangent to the center line of the pipes. Shelves shall be constructed to the elevations of the highest pipe crown and slope to drain toward the flowing through channel. Underlayment of the invert and shelf shall consist of brick masonry or concrete fill.
- C. Base and barrel sections shall be used as shown on the drawings. The designated barrel size shall extend from the top of the cast-in-place base to the bottom of the eccentric dome or slab top. Wall thickness shall be 5 inch for 4 foot diameter sections. The thickness of the bottom slab of precast bases shall not be less than the manhole barrel section or top slab, whichever is greater. Design for reinforcement shall not be less than that for the top slab.
- D. Top sections of 4 foot diameter manholes shall be eccentric except where the depth of cover over the top of pipe is 4 feet or less; in which case a precast concrete slab shall be used.
- E. Manhole frames and covers shall be cast iron heavy duty, Product Number NPR11-890A, 2006A1 Cover, as manufactured by the East Jordan Iron Works, and provide a 31 3/4 inch cover as shown on the drawings.
- F. Sections shall have tongue and groove joints with an approved round rubber O-ring gasket, or a pre-formed flexible sealant

such as Ram-Nek, Kent Seal No. 2 or equal.

- G. The round rubber O-ring gaskets shall conform to ASTM C443.
- H. All sections shall be cured by an approved method and shall not be shipped nor subjected to loading until the concrete compressive strength has attained 3,000 psi and not before five days after fabrication and/or repair, whichever is longer.
- I. Precast concrete top slabs shall be designed for a minimum of H-20 loading plus the weight of the soil above.
- J. The date of manufacture and the name and trademark of the manufacturer shall be clearly marked on the inside of each precast section.
- K. Manhole steps shall be used in all manholes and structures. The steps shall be copolymer polypropylene plastic with an approximate dimension of 14 x 8 inch, as manufactured by Field Industries. The steps shall include $\frac{1}{2}$ inch grade 60 steel reinforcement.

PART 3.00 - EXECUTION

3.01 INSTALLATION

- A. Manholes shall be constructed to the dimensions shown on the drawings and as specified herein.
- B. Bases shall be placed on a bed of crushed stone as shown on the drawings. Brick lined channels shall correspond in shape with the lower half of the pipe. The top of the shelf shall be set at the elevation of the crown of the highest pipe and shall be sloped to drain toward the flow-through channel.
- C. Precast concrete barrel sections shall be set so as to be vertical and with sections in true alignment with a 1/4 inch maximum tolerance to be allowed. The inside joint shall be filled with non-shrink mortar and finished flush with the adjoining surfaces. Backfilling shall be done in a careful manner, bringing the fill up evenly on all sides. The CONTRACTOR shall install the precast sections in a manner that will result in a watertight joint.
- D. Holes in concrete barrel sections required for handling or other purposes shall be plugged with a non-shrinking grout or non-shrinking grout in combination with concrete plugs, and finished flush on the inside.
- E. Where holes must be field cut in precast sections to accommodate pipe holes shall be cored. A "Cor-N-Seal" boot or approved equal shall be installed as recommended by the manufacturer.
- F. All work shall be protected against flooding and flotation.

- G. Frames shall be set with the tops conforming accurately to the grade of the pavement, or finished ground surface, or as indicated on the drawings or as directed. Circular frames shall be set concentric with the top of the masonry. All frames shall be set in a full bed of mortar so that the space between the top of the masonry and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the masonry shall be placed all around the bottom flange. The mortar shall be smoothly finished and have a slight slope to shed water away from the frame.
- H. The areas disturbed in constructing the manholes shall be graded and all site work necessary to achieve a finished surface as indicated on the drawings shall be performed. Where topsoiling and seeding are required, it shall be completed in accordance with these Specifications. All grading and site work shall be completed to the satisfaction of the CITY.
- I. Pipe connections to sewer manholes shall be watertight and may be sealed using non-shrink grout or any of the following methods may be used:
1. The "Lock Joint Flexible Manhole Sleeve" shall be cast in the precast manhole base. The stainless steel strap shall be protected from corrosion with a bituminous coating.
 2. The "RES-SEAL", a cast iron compression ring which compresses a rubber ring into a tapered hole in the barrel, shall be used for sealing the pipe into the manhole barrel. Exposed metal shall be protected from corrosion with a bituminous coating.
 3. "KOR-N-SEAL" joint shall be installed as recommended by the manufacturer. The stainless steel clamp shall be protected from corrosion with a bituminous coating.
- J. Manhole steps, when specified, shall be cast into the walls of risers and conical top sections, and shall be aligned vertically and spaced so as to be on equal centers in the assembled manhole at a maximum distance apart of 12 inches. Steps shall be located a minimum of 6 inches from the ends of risers and top section, and shall be securely embedded in manhole risers and cones.

END OF SECTION

2023 CITY ROADWAY IMPROVEMENTS
MASONRY FOR MISCELLANEOUS WORK
SECTION 04200

SECTION 04200

MASONRY FOR MISCELLANEOUS WORK

PART 1.00 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required to construct brick work for manhole inverts and shelves and casting grade adjustments and other masonry work not detailed in other sections. Grouting is included in this Section.

1.02 APPROVAL OF MATERIALS

Submit, upon request by the CITY, samples of any materials the CONTRACTOR proposes to use under this Section.

PART 2.00 - PRODUCTS

2.01 MATERIALS

A. Brick:

For sewerage and drainage structures use manhole brick, grade MS or MM.

B. Mortar Components:

1. Air-entraining Portland cement Type II-A
2. Lime for cement mortar shall be Hydrated Lime for masonry purposes, Type S.
3. Sand for cement mortar shall be washed, natural sand and shall consist of clean, hard, angular, durable grains, uniformly graded from coarse to fine, and shall be free from injurious amounts of vegetable matter or other harmful substances. The sand shall be graded as follows:

SIEVE % BY WEIGHT PASSING SQUARE MESH SIEVES	
No. 8	100
No. 50	15-40
No. 100	0-10
No. 200	0-5

4. Commercially bagged mortar mixes may be used only upon written approval of the CITY.
5. Masonry cements may be used upon written approval of the CITY.
6. Water shall be free from injurious amounts of oils, acids, alkalis or organic matter, and shall be clean and fresh.

7. Additives for non-shrink grout:

- a. Superfine, unpolished aluminum powder blended with pozzolan or pumicite.
- b. Commercially prepared additives may be used only upon written approval of the CITY.

C. Non-Shrink Grout:

1. Grout shall be Portland Cement based, non-metallic, non-shrink grout.
2. Grout shall conform to ASTM C0827 CRD-C588 to have 0.00% early volume shrinking change and a minimum of +0.03% unrestrained expansion.
3. Non-shrink grout shall be equal to Five Star Grout as manufactured by U.S. Grout or Horn Non-Corrosive Non-Shrink Grout as manufactured by AC Horn, Inc.
4. Where required for the special purpose of sealing infiltration through cracks, Water Plug shall be allowed. Under no circumstances shall Water Plug or approved equal be used as a substitute for properly installed non-shrink grout.

PART 3.00 - EXECUTION

3.01 STORAGE OF MATERIALS

- A. All perishable materials for the work of this Section shall be delivered, stored and handled so as to preclude damage of any nature. Manufactured materials, such as cement and lime, shall be delivered and stored in their original containers, plainly marked with identification of material and maker. Materials in broken containers, or in packages showing water marks, or other evidence of damage, shall not be used and shall be removed from the site.

3.02 MIXING

- A. Mix mortar as per the following proportions:
1 part cement
1/4 part lime
3 parts sand
Enough water to form a plastic composition
- B. Ingredients shall be accurately measured by container volume.
- C. Salts or other ingredients for the purpose of lowering the freezing point of the mortar shall not be used.
- D. Mortar shall be machine mixed in an approved type of mixer in which the quantity of water can be accurately and uniformly controlled. The mixing time shall not be less than 5 minutes, approximately 2 minutes of which shall be for mixing the dry

materials and not less than 3 minutes for continuing the mixing after the water has been added. Where hydrated lime is used for mortar requiring a lime content, the CONTRACTOR will have the option of using the dry-mix method of first converting the hydrated lime into a putty. Where the dry-mix method is employed, the materials for each batch shall be well turned over together until the even color of the mixed dry materials indicated that the cementitious material has been thoroughly distributed throughout the mass, after which the water shall be gradually added until a thoroughly mixed mortar of the required plasticity is obtained.

- E. Mortar that has begun to set shall not be used.
- F. Hand mixing in suitable mortar pans in amounts not to exceed 4 cubic feet may be permitted only upon approval of the CITY.

3.03 MIXING OF NON-SHRINK GROUT

- A. Grout shall be thoroughly mixed to the driest consistency practicable for the application or use. Mix only the amount of material that can be placed in 30 minutes. Retempering will not be permitted.
- B. For large areas of more than 3 inches in depth, 3/8 inch washed pea gravel should be added at a ratio of up to 40% by weight to the amount of grout with which it will be mixed.

3.04 PLACING AND PROTECTION

- A. All brick shall be thoroughly wet before laying, except in freezing weather. No brick having a film of frost or snow on its surface shall be used. No masonry work shall be performed when the temperature falls below 36 degrees F., unless the work is enclosed and heated, except that rising temperature, work may be begun at 33 degrees F. When mortar is mixed at temperatures below 40 degrees F., the water shall be heated to a minimum of 70 degrees F., but not more than 160 degrees F. All masonry work shall be so protected and/or heated that the temperature of the surface will not fall below 40 degrees F., for a period of 48 hours after placing. In the foregoing, the temperatures refer to effective temperatures, taking into account wind chill effect.
- B. Any completed work found to be affected by freezing shall be taken down and rebuilt by the CONTRACTOR at his expense.
- C. Masonry shall be laid plumb, true to line, with level courses accurately spaced. Brick shall be laid up with the better face of the brick exposed, and with horizontal and vertical points completely filled with mortar. In vertical brickwork such as concentric adjustment to frames and covers alternating courses of stretches and headers shall be employed to effect proper bonding of courses.

END OF SECTION

2023 CITY ROADWAY IMPROVEMENTS
MISCELLANEOUS METALS
SECTION 05500

SECTION 05500

MISCELLANEOUS METALS

PART 1.00 - GENERAL

1.01 SCOPE OF WORK

- A. All miscellaneous metal items required for the proper completion of the work not covered in other sections of these Specifications.
- B. Related Work Described Elsewhere:
 - 1. Precast Concrete Sections - Section 03401 (Not Applicable)
 - 2. Masonry for Miscellaneous Work - Section 04200

1.02 SUBMITTAL

Submit complete shop drawings for all Items under this Section. Shop drawings to show sizes, thickness or gauge and all installation details. No materials shall be fabricated or shipped prior to approval of the shop drawings.

PART 2.00 - PRODUCTS

2.01 FABRICATED PRODUCTS

- A. Manhole frames and covers shall be cast iron, or ductile iron, smooth, free from scale, lumps, blisters, sand holes, and defects of any kind which render them unfit for the service for which they are intended. These castings shall be thoroughly cleaned before leaving the foundry and subjected to the hammer test, after which they shall be covered with asphalt or other approved substance applied at a temperature of about 300 degrees F, in such a manner as to provide a durable and tenacious coating. All finished surfaces shall be true and seat all points without rocking. Manhole frames and covers and catch basin frame and grates shall conform in style and dimension to the detail shown in the drawings.
- B. Manhole frames and covers shall be Heavy Duty, No. LK256 as manufactured by the LeBaron Foundry, Inc., or EJ and provide a 30 inch clear opening as shown on the drawings.

PART 3.00 - EXECUTION

3.01 FABRICATION OF METAL WORK

- A. All miscellaneous metal work shall be formed to detail with clean, straight, sharply defined profiles, and smooth surfaces of uniform color and texture, and free from defects impairing strength and durability.

- B. Connections and accessories shall be of sufficient strength to withstand safety stresses and strains to which they will be subjected. Steel accessories and connections to steel or cast iron shall be steel, unless otherwise specified. Threaded connections shall be wrought for ductile iron, unless otherwise specified. Threaded connections shall be made so that the threads are concealed by fittings.
- C. Welded joints shall be rigid and continuously welded or spot welded as specified or as shown. The face of welds shall be dressed flush and smooth. Exposed joints shall be close fitting and joined where least conspicuous. Welded parts shall be in accordance with the Standard Code for Arc and Gas Welding in Building Construction of AWS and shall only be done where shown, specified, or permitted by the CITY. All welding shall be done by welders certified as to their ability to perform welding in accordance with the requirements of the AWS code. Component parts of built-up members to be welded shall be adequately supported and clamped or held by other adequate means to hold the parts in proper relation for welding.

3.03 INSTALLATION

- A. Install all items furnished including items to be embedded in concrete or other masonry. Fastening to wood plugs in masonry will not be permitted.
- B. All steel surfaces to come in contact with exposed concrete or masonry shall receive a protective coating of an approved heavy bituminous troweling mastic applied in accordance with the manufacturer's instructions prior to installation.
- C. Set manhole cover frames in place on a full bed of mortar and adjust to height so that the top of the frame conforms to the finished surface. Completely fill all voids between the bricks with mortar and extend the mortar over the outside of the frame as shown on the drawings.

END OF SECTION

2023 CITY ROADWAY IMPROVEMENTS
HDPE PIPE AND FITTINGS
SECTION 15064

SECTION 15064

HDPE PIPE AND FITTINGS

PART 1.00 - GENERAL

1.01 DESCRIPTION

A. Work Included:

This Section includes furnishing, laying, joining, installing and testing all HDPE gravity drain pipes, service connections and fittings complete as shown on the drawings and/or as specified herein.

B. Related Work Described Elsewhere:

1. Trenching, Backfill and Compaction - Section 02221.

1.02 QUALITY ASSURANCE

- A. All HDPE pipe to be installed under this contract may be inspected at the factory for compliance with these Specifications by an independent testing laboratory selected by the CITY. The CONTRACTOR shall require the manufacturer's cooperation in these inspections. The cost of factory inspection of all pipe approved for this contract, plus the cost of inspection of a reasonable amount of disapproved pipe, will be borne by the CITY.

1.03 APPROVAL AND SCHEDULING OF MATERIALS

- A. Submit to the CITY, within ten days after signing of the contract, a list of materials to be furnished, the names of the suppliers and the date of delivery of materials to the site.
- B. CONTRACTOR shall, upon accepting delivery of the pipe, provide two copies of pipe manufacturer certification that inspection and all specified tests have been made.

PART 2.00 - PRODUCTS

2.01 MATERIALS - HDPE GRAVITY DRAINAGE PIPE

- A. The pipe and fittings described in this Section shall be ADS N-12 WT IB pipe (per ASTM F2648) for use in gravity-flow land drainage applications. Pipe shall have smooth interior and annular exterior corrugations. Manning's "n" value shall be 0.012.
- B. All joints shall be watertight according to the requirements of ASTM D3212. Gaskets shall meet the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with removable, protective wrap to ensure the gasket

is free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly. 12-inch pipe shall have a reinforced bell with a polymer composite band. The bell tolerance device shall be installed by the manufacturer

- C. Fittings shall conform to ASTM F 2306. Bell and spigot connections shall utilize a spun-on or welded bell and valley gasket or saddle gasket meeting the watertight joint performance requirements of ASTM F 2306.
- D. Material for pipe productions shall be an engineered compound and recycled high-density polyethylene conforming with the minimum requirements of cell classification 424420C (ESCR Test Condition B) for 4-through 10-inch diameters, and 43520C (ESCR Test Condition B) for 12-through 60-inch diameters, as defined and described in the latest version of ASTM D3350, except that carbon black content should not exceed 4%.

PART 3.00 - EXECUTION

3.01 HANDLING PIPE AND FITTINGS

- A. Care shall be taken during loading, transporting and unloading to prevent injury to the pipe or gaskets. Under no circumstances shall pipe or fittings be dropped. All pipe and fittings shall be examined before laying, and no piece shall be installed which is found to be defective.
- B. All pipe delivered to the job site shall be accompanied by independent laboratory reports certifying that the pipe and fitting conform as specified herein.
- C. If any defective pipe is discovered after it has been laid, it shall be removed and replaced with sound pipe in a satisfactory manner by the CONTRACTOR, at his own expense. All pipe and fittings shall be examined before laying, and no piece shall be installed which is found to be defective.

3.02 LAYING PIPE AND FITTINGS

- A. All work shall be constructed in strict accordance with the lines and grades shown on the Contract drawings and the CONTRACTOR shall be held fully responsible for keeping correct alignment and grade.
- B. As soon as excavation is completed to normal grade of trench bottom, the CONTRACTOR shall immediately place a bed of crushed stone conforming to the requirements specified under Section 02221. The pipe shall then be laid accurately to line and grade. Bell holes shall be excavated so that only the barrel of pipe shall bear upon the gravel over the trench bottom. Blocking under the pipe shall not be permitted. Stone shall be placed to mid-diameter and thoroughly compacted to give firm support of the pipe. The spigot shall be pushed

home into the adjacent bell to form a closed joint. The interior of each pipe shall be inspected while being joined to see that alignment is preserved. Complete backfilling as specified in Section 02221.

- C. Laying and jointing instructions of the pipe manufacturer shall be followed explicitly. The CONTRACTOR shall examine each bell and spigot end to determine whether the preformed joint has been damaged prior to installation. Any pipe having defective joint surfaces shall be rejected, marked as such, and immediately removed from the job site.
- D. Service connections shall be made following the installation, testing and acceptance of the sewer main.
- E. All pipe shall be sound and clean before laying. When laying is not in progress, including lunch time, the open ends of the pipe shall be closed by watertight plug or other approved means. Good alignment shall be preserved in laying.

3.03 CLEANING

- A. Open ends of pipe shall be protected to prevent the entrance of debris.
- B. Prior to testing, thoroughly clean the pipe.
- C. All pipe and fittings must be free of any foreign matter before final inspection.

3.06 COMPLETION OF WORK

- A. Full payment for HDPE gravity drainage main and service connections shall not be made until the line has been cleaned and tested satisfactorily. Unsatisfactory clean up shall be grounds for withholding payment for sewer pipe pay items. Lines must be cleaned at the time of final inspection.

END OF SECTION

2023 CITY ROADWAY IMPROVEMENTS

APPENDIX A

RECLAIMING & COLD IN-PLACE RECYCLING

The following streets are scheduled to be pulverized, fine graded and compacted, resurfaced with a 2" binder course and 1½" finish course, except where noted, in accordance with the Contract Documents:

Plaza Drive

Sachem Road (Legion Way to southerly dead end)

Holland Avenue (Legion to Harrington Street)

Becker Avenue (Legion Way to Willett Avenue)

Breeze Way (Legion Way to Glenrose Drive)

Rowena Drive (Legion Way to Glenrose Drive)

Goodall Place

East Knowlton Street

Commercial Way (600'+/- from Taunton Ave) 3-inch binder 2" top, approximately
1,000 LF of curb reset)

The following streets are scheduled to be cold in-place recycled, resurfaced with a 2" finish course, except where noted, in accordance with the Contract Documents:

Almeida Way

J Medeiros Way

Martin Street

The City of East Providence reserves the right to add, delete or change the actual streets to be improved in this manner during this contract period.

NOTE: The Contractor shall be responsible to contact Mike Romano, National Grid at 617-910-7854 when working within 200 feet of gas regulator station for station monitoring during road construction. Gas regulator stations located at intersections between Bullocks Point Ave and Crescent View Ave, Mauran Ave and First Street and Amaral Street and Wampanoag Trail.

2023 CITY ROADWAY IMPROVEMENTS

APPENDIX B

The following streets are scheduled to be cold planed 2" and resurfaced with a 2" Bituminous Surface Course overlay in accordance with the Contract Documents:

Mayfair Drive
Bicknell Avenue
Catlin Avenue
Rosemere Drive

Alice Street
Sanford Street
Henry Street
Wayland Street

South Blossom Street
Fenmoor Street
Brown Street (Warren Avenue to Brightridge Avenue)
Intervale Avenue
Hawthorne Avenue
Outlook Avenue (Brightridge Avenue to Hawthorne Avenue)
Windhurst Avenue

Dartmouth Avenue
Florence Street
Hartford Avenue
Cozzens Avenue
Sunset Avenue

The City of East Providence reserves the right to add, delete or change the actual streets to be improved in this manner during this contract period.

2023 CITY ROADWAY IMPROVEMENTS

APPENDIX C

The following streets are scheduled to receive a 2" Bituminous Surface Coarse Overlay in accordance with the Contract Documents:

Door Avenue (Read St to westerly end)
Holmes Avenue

The City of East Providence reserves the right to add, delete or change the actual streets to be improved in this manner during this contract period.

2023 CITY ROADWAY IMPROVEMENTS

APPENDIX D HANDICAP RAMPS

The following streets are to receive a sidewalk handicap access ramp in accordance with the Contract Documents. Location shall be directed by the CITY.

Not Applicable

The City of East Providence reserves the right to add, delete or change the number and/or locations of handicap ramps during this contract period.

2023 CITY ROADWAY IMPROVEMENTS

APPENDIX E

New Granite Inlet Stones are to be installed at the following locations:

Schedule not applicable at this time

The City of East Providence reserves the right to add, delete or change the number and/or locations of granite inlet stone during the contract period.

2023 ROADWAY IMPROVEMENTS

SIDEWALKS
APPENDIX F

The following streets are to receive Concrete Sidewalks in accordance with the Contract Documents and as directed by the CITY.

<u>LOCATION</u>	<u>APPROXIMATE DIMENSIONS</u>	
	<u>4" CONCRETE SIDEWALK</u>	<u>6" CONCRETE DRIVEWAY W/WIRE MESH</u>
Not Applicable		
The following streets are to receive Hot Mix Asphalt Sidewalks in accordance with the Contract Documents and as directed by the CITY.		
Sidewalk between Somerset Avenue and Riverside Middle School including sidewalk connecting this sidewalk to newly installed sidewalk on Easterly side of new parking lot.		

The City of East Providence reserves the right to add, delete or change the actual sidewalk areas to be improved during this contract period.

2023 CITY ROADWAY IMPROVEMENTS

APPENDIX G

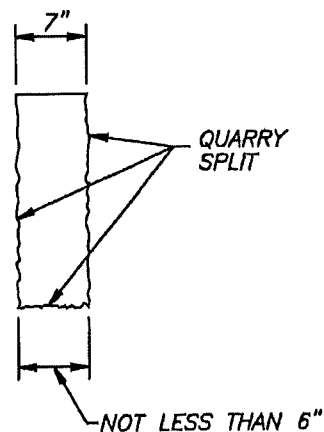
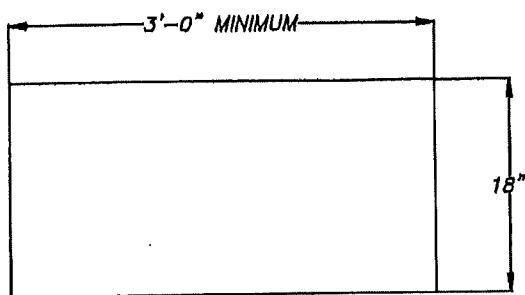
- A. Granite Curb Quarry Split
East Providence Standard R-31A
- B. Granite Curb-Quarry Split Inlet Stone
East Providence Standard R-33
- C. Wheelchair Ramp Detail
East Providence Standard R-63, R-64B and R-64A
- D. Sidewalk Detail
East Providence Standard R-65
- E. Roadway Detail
East Providence Standard R-51
- F. Square Frame & Grate
East Providence Standard C-52
- G. Sanitary Frame & Cover Detail C-59
- H. Bituminous Berm R-22A
- I. Typical Road Striping R-71B & R-71C
- J. Pre-cast Catch Basin
East Providence Standard C-07
- K. Trench Detail T-05
- L. Manhole Detail C-35



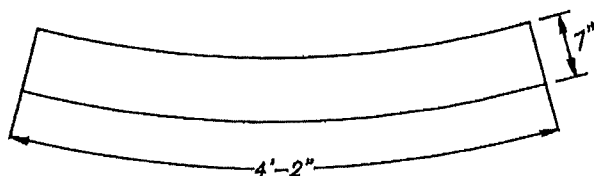
**CITY OF EAST PROVIDENCE
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
STANDARD DETAIL**



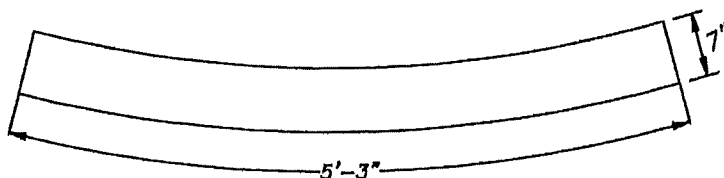
GRANITE CURB QUARRY SPLIT



CIRCULAR CURB



8' RADIUS



10' RADIUS

NOTES

1. MAXIMUM LENGTHS USING 8' & 10' RADII, WITH 90° ANGLE, ARE 4'-2" AND 5'-3" RESPECTIVELY.
2. MINIMUM LENGTH OF STRAIGHT OR CIRCULAR FILLER PIECES TO BE 3'-0"
3. TOP SURFACE TO BE DRESSED BY SAW.
4. CIRCULAR CURB IS REQUIRED ON CURVES WITH RADII OF 160' OR LESS. STRAIGHT CURB TO BE USED CURVES OF MORE THEN 160' RADIUS

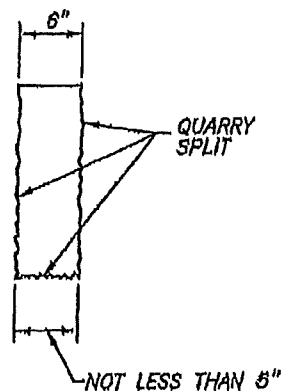
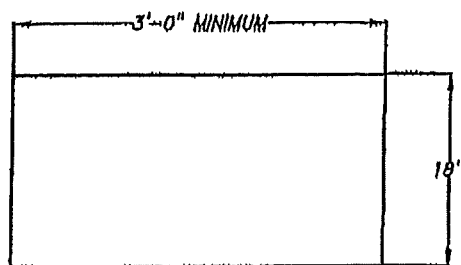
REV. BY	DATE	REV. BY	DATE	DRAWN BY: KAREN LANOUE	DATE: 7/24/01
				APPROVED BY: STEPHEN H. COUTU, P.E.	DATE: 7/24/01
				CITY ENGINEER/DEPUTY D.P.W.	SCALE: NTS



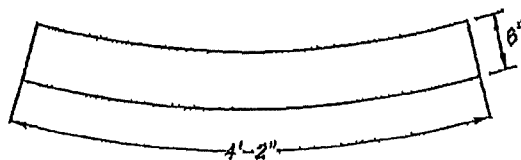
CITY OF EAST PROVIDENCE
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
STANDARD DETAIL



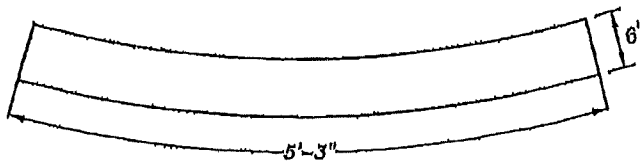
GRANITE CURB QUARRY SPLIT
(FOR SUBDIVISIONS ONLY)



CIRCULAR CURB



8' RADIUS



10' RADIUS

NOTES

1. MAXIMUM LENGTHS USING 8' & 10' RADII, WITH 90° ANGLE, ARE 4'-2" AND 5'-3" RESPECTIVELY.
2. MINIMUM LENGTH OF STRAIGHT OR CIRCULAR FILLER PIECES TO BE 3'-0"
3. TOP SURFACE TO BE DRESSED BY SAW.
4. CIRCULAR CURB IS REQUIRED ON CURVES WITH RADII OF 160' OR LESS. STRAIGHT CURB TO BE USED ON CURVES OF MORE THAN 160' RADIUS

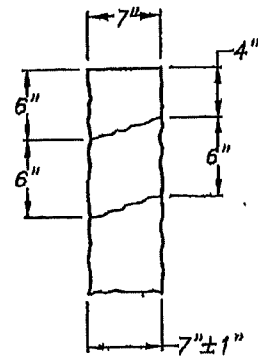
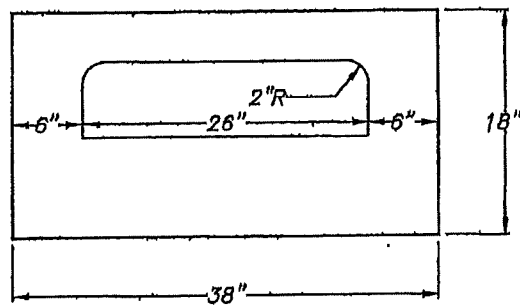
REV. BY	DATE	REV. BY	DATE	DRAWN BY: KAREN LANQUE	DATE: 8/2/99
K.L.L.	7/25/01			APPROVED BY: STEPHEN H. COUTU, P.E. CITY ENGINEER/DEPUTY D.P.W.	DATE: 8/2/99 SCALE: NTS



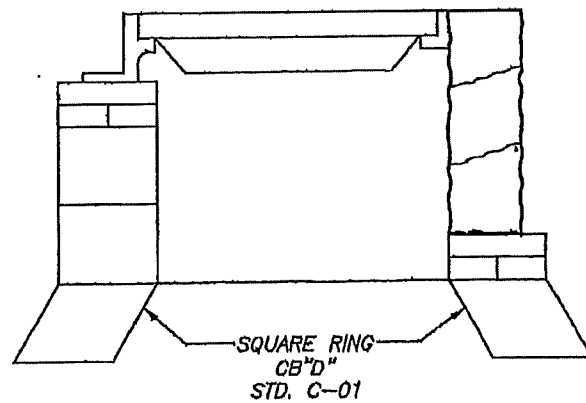
CITY OF EAST PROVIDENCE
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
STANDARD DETAIL



GRANITE CURB-QUARRY SPLIT
INLET STONE



NOTE:
TOP SURFACE TO BE DRESSED
BY SAW REMAINDER TO BE
QUARRY SPLIT.



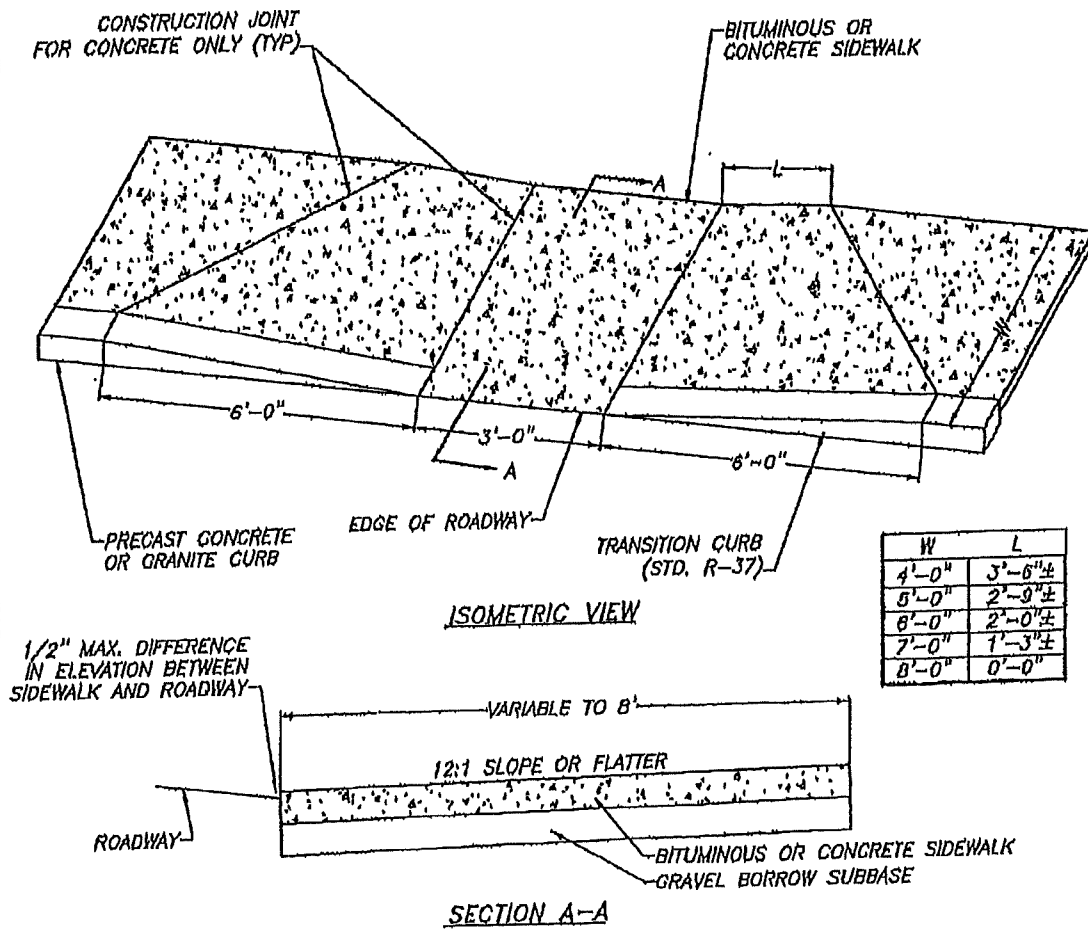
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K.L.L.	7/25/01			APPROVED BY: STEPHEN H. COUTU, P.E. CITY ENGINEER/DEPUTY D.P.W.	DATE:
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CITY OF EAST PROVIDENCE
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
STANDARD DETAIL



WHEELCHAIR RAMP



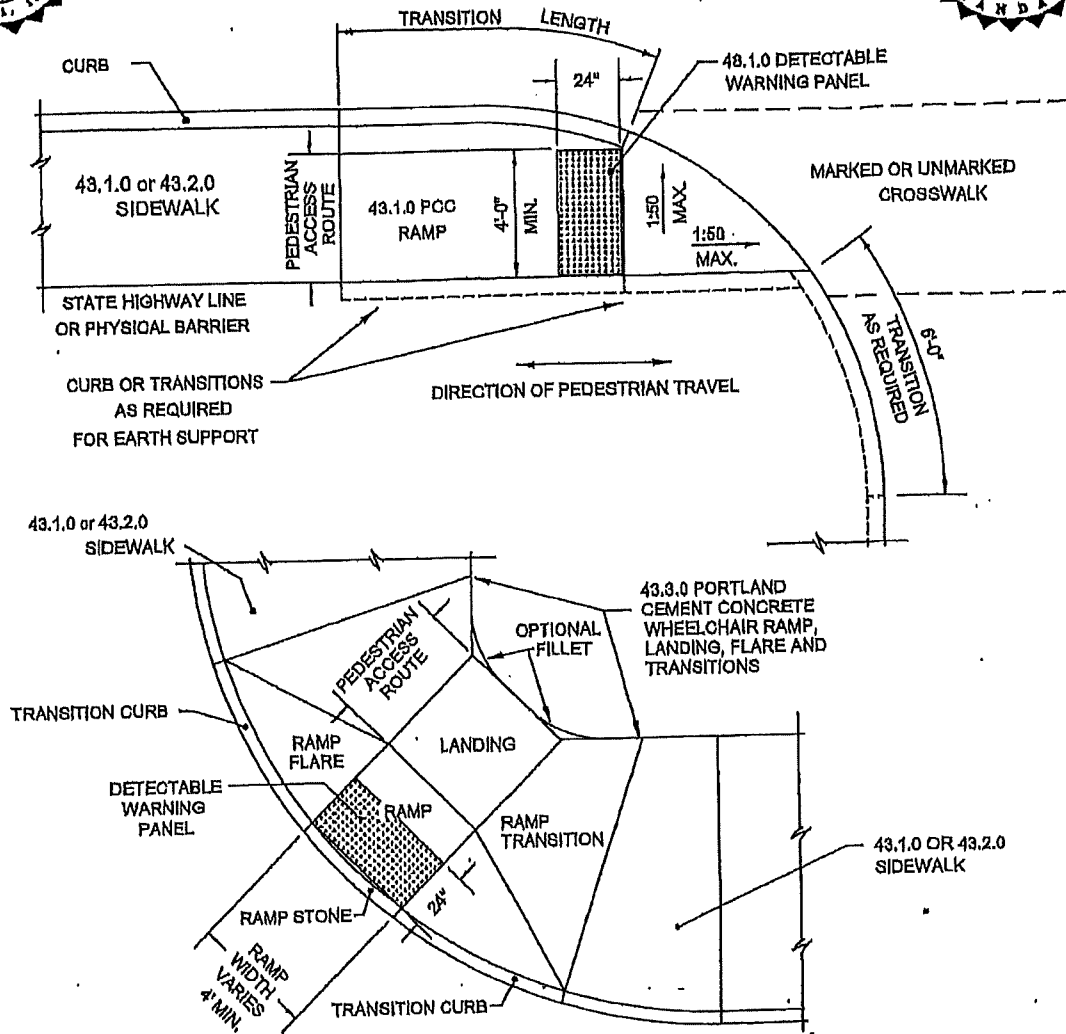
NOTES:

1. WHEN A UTILITY POLE LOCATED IN THE SIDEWALK FALLS WITHIN A CROSSWALK AREA, THE WHEELCHAIR RAMP WILL BE PLACED SUCH THAT THE POLE FALLS OUTSIDE THE RAMP.
2. AT NO TIME IS ANY PART OF THE WHEELCHAIR RAMP TO BE LOCATED OUTSIDE OF THE CROSSWALK, AND IT IS TO BE CENTERED WHENEVER POSSIBLE.
3. DRAINAGE FACILITIES ARE TO BE LOCATED UP-GRADE OF ALL WHEELCHAIR RAMPS.
4. LOCATION OF WHEELCHAIR RAMPS SHOWN ON CONTRACT DRAWINGS.

REV. BY	DATE	REV. BY	DATE	DRAWN BY: E. GERMANI IV	DATE: 3/25/99
K.L.L.	5/17/05			APPROVED BY: STEPHEN H. COUTU, P.E. CITY ENGINEER/DEPUTY D.P.W.	DATE: 3/25/99
					SCALE: NTS



**CITY OF EAST PROVIDENCE
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
STANDARD DETAIL**



**SIDEWALK CORNER
WITH WHEELCHAIR RAMP**

NOTES:

1. WHEN A UTILITY POLE LOCATED IN THE SIDEWALK FALLS WITHIN A CROSSWALK AREA, THE WHEELCHAIR RAMP WILL BE PLACED SUCH THAT THE POLE FALLS OUTSIDE THE RAMP.
2. AT NO TIME IS ANY PART OF THE WHEELCHAIR RAMP TO BE LOCATED OUTSIDE OF THE CROSSWALK, AND IT IS TO BE CENTERED WHENEVER POSSIBLE.
3. DRAINAGE FACILITIES ARE TO BE LOCATED UP-GRADE OF ALL WHEELCHAIR RAMPS.
4. DETECTABLE WARNING PANEL SHALL BE IN ACCORDANCE WITH SECTION 942 OF THE RHODE ISLAND STANDARD SPECIFICATIONS; PANEL TO MATCH RAMP WIDTH.

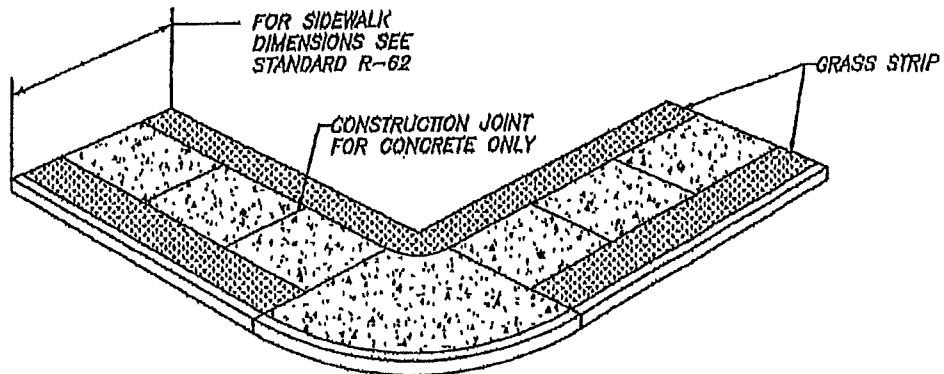
REV. BY	DATE	REV. BY	DATE	DRAWN BY: E. GERMANI IV	DATE: , ,
				APPROVED BY: STEPHEN H. COUTU, P.E.	DATE: , ,
				CITY ENGINEER/DEPUTY D.P.W.	SCALE: NTS



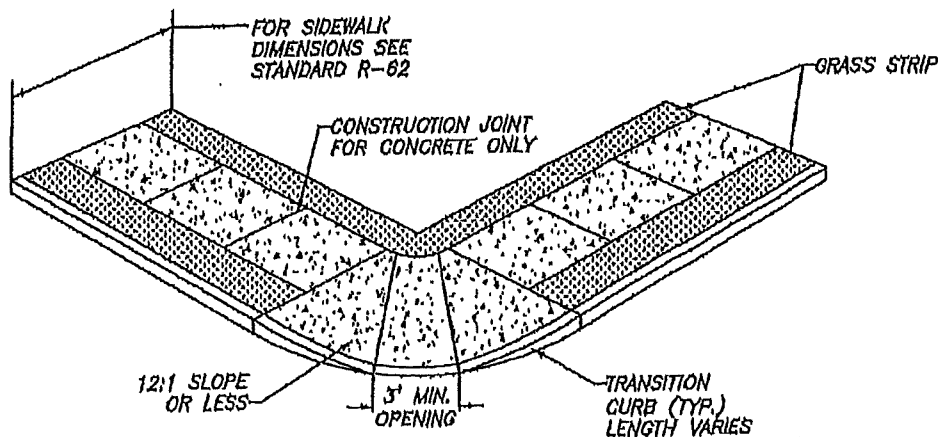
CITY OF EAST PROVIDENCE
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
STANDARD DETAIL



SIDEWALK CORNERS



SIDEWALK CORNER



SIDEWALK CORNER
WITH WHEELCHAIR RAMP

NOTES:

1. WHEN A UTILITY POLE LOCATED IN THE SIDEWALK FALLS WITHIN A CROSSWALK AREA, THE WHEELCHAIR RAMP WILL BE PLACED SUCH THAT THE POLE FALLS OUTSIDE THE RAMP.
2. AT NO TIME IS ANY PART OF THE WHEELCHAIR RAMP TO BE LOCATED OUTSIDE OF THE CROSSWALK, AND IT IS TO BE CENTERED WHENEVER POSSIBLE.
3. DRAINAGE FACILITIES ARE TO BE LOCATED UP-GRADE OF ALL WHEELCHAIR RAMPS.
4. LOCATION OF WHEELCHAIR RAMPS SHOWN ON CONTRACT DRAWINGS.

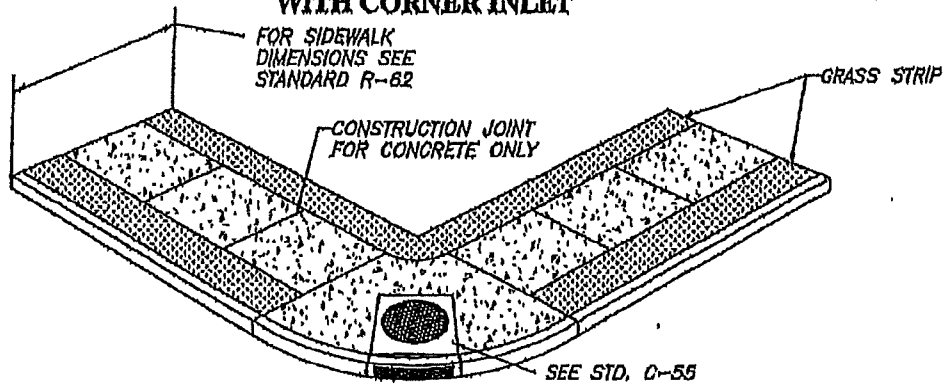
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				APPROVED BY: STEPHEN H. COUTU, P.E.	DATE: 5/12/99
				CITY ENGINEER/DEPUTY D.P.W.	SCALE: NYS



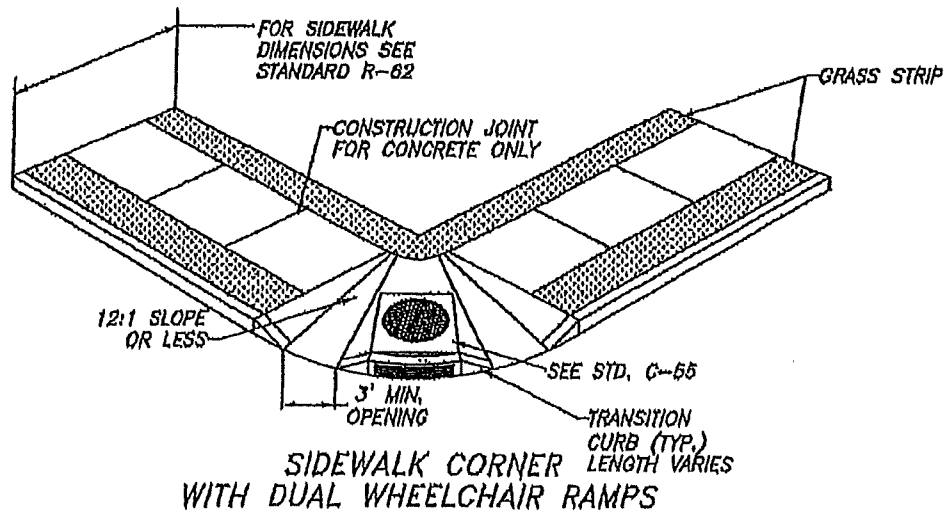
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DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
STANDARD DETAIL



SIDEWALK CORNERS
WITH CORNER INLET



SIDEWALK CORNER



SIDEWALK CORNER
WITH DUAL WHEELCHAIR RAMPS

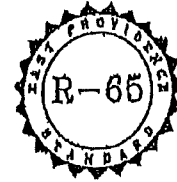
NOTES:

1. WHEN A UTILITY POLE LOCATED IN THE SIDEWALK FALLS WITHIN A CROSSWALK AREA, THE WHEELCHAIR RAMP WILL BE PLACED SUCH THAT THE POLE FALLS OUTSIDE THE RAMP.
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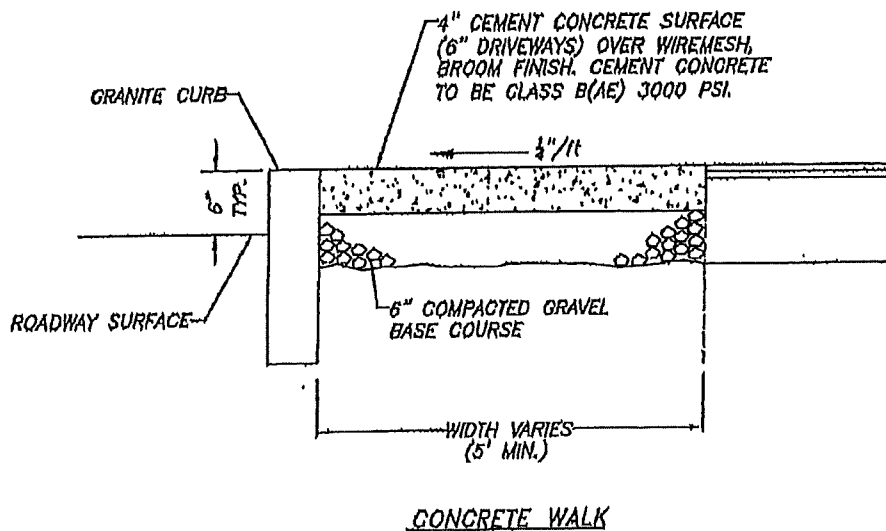
REV. BY	DATE	REV. BY	DATE	DRAWN BY: E. GERMANI IV	DATE: 5/12/99
				APPROVED BY: STEPHEN H. COUTU, P.E.	DATE: 5/12/99
				CITY ENGINEER/DEPUTY D.P.W.	SCALE: NTS



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DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
STANDARD DETAIL



SIDEWALK DETAIL



NOTE:

GRAVEL BASE COURSE TO CONFORM TO STATE STANDARD
SPECIFICATIONS AS SHOWN IN COLUMN I, SUBSECTION M.01.09

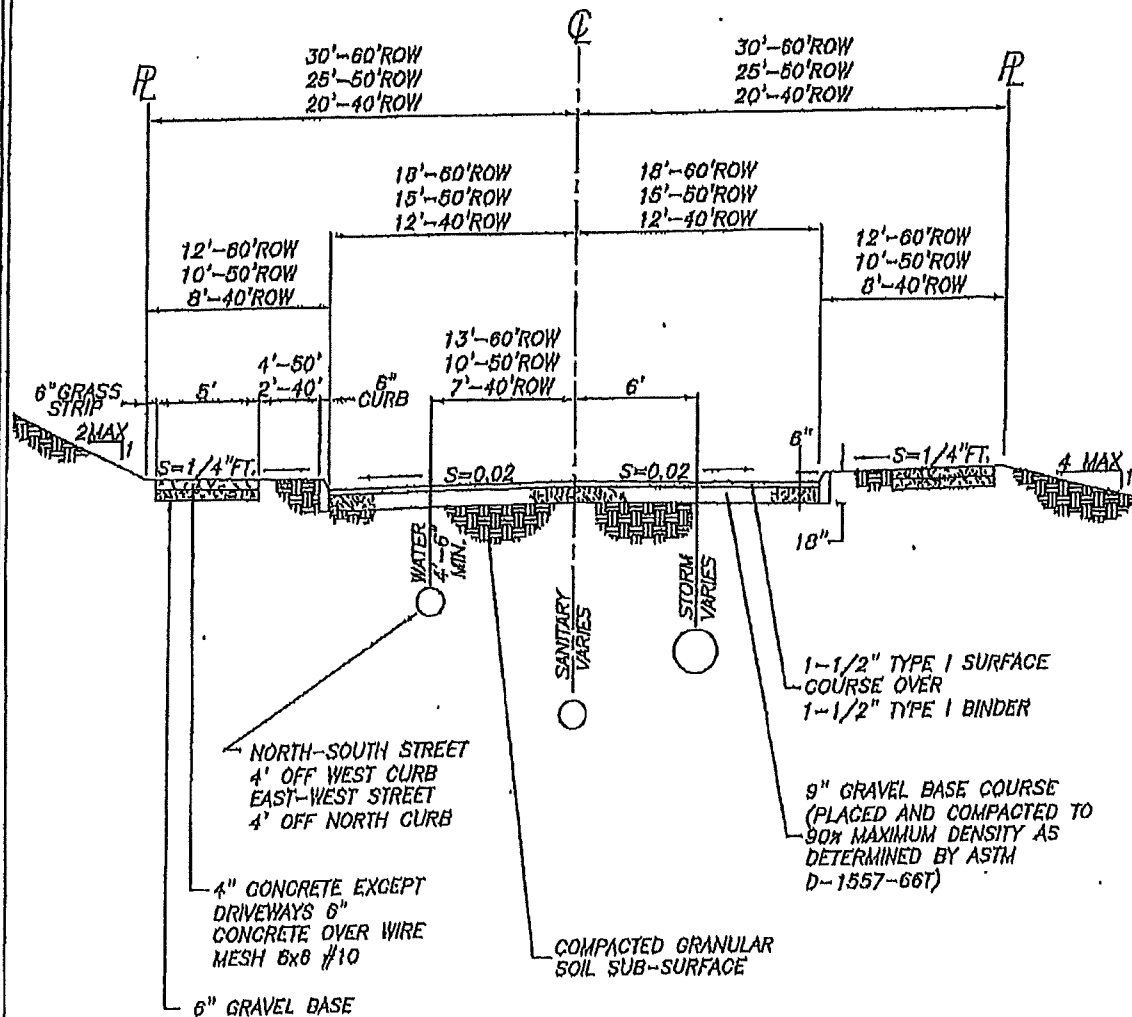
REV. BY	DATE	REV. BY	DATE	DRAWN BY: KAREN LANOUE	DATE: 01/09/03
K.L.L.	9/28/06			APPROVED BY: STEPHEN H. COUTU, P.E. CITY ENGINEER/DEPUTY D.P.W.	DATE: 01/09/03
					SCALE: NTS



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DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
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TYPICAL ROAD SECTION
RESIDENTIAL STREET



REV. BY	DATE	REV. BY	DATE	DRAWN BY: KAREN LANOVE	DATE: 10/05/89
EOS/aglv	11/8/13			APPROVED BY: STEPHEN H. COUTU, P.E. CITY ENGINEER/DEPUTY D.P.W.	DATE: 10/05/99 SCALE: NYS

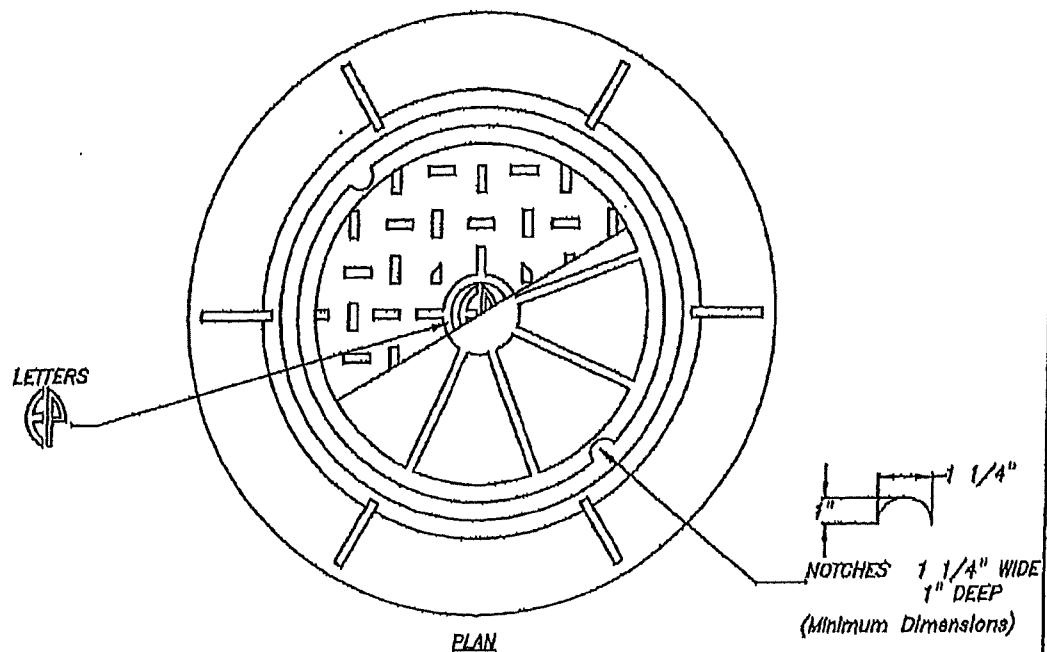
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				APPROVED BY: STEPHEN H. COUTU, P.E. CITY ENGINEER/DEPUTY D.P.W.	DATE: 4/9/99
					SCALE: NTS



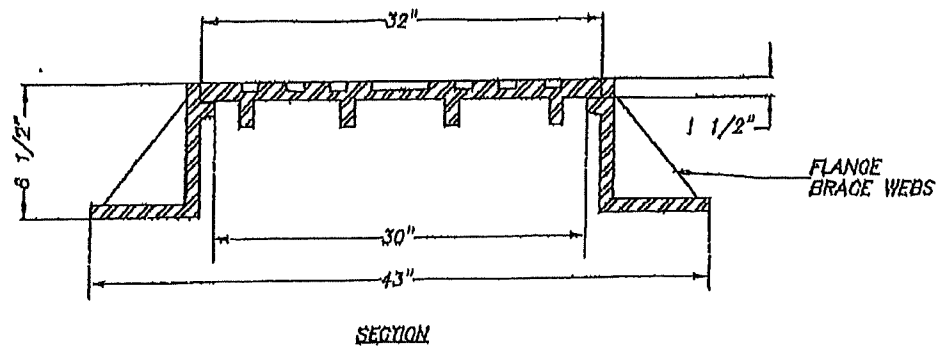
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SANITARY FRAME AND COVER DETAIL



- NOTE:
1. VENTILATION HOLES OF ANY SIZE ARE NOT ALLOWED
2. TOTAL WEIGHT = 590lbs.



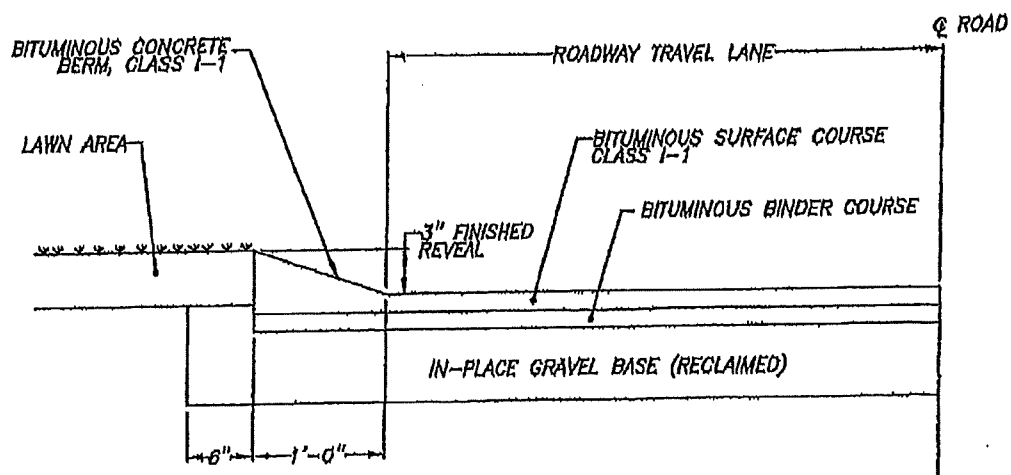
REV. BY	DATE	REV. BY	DATE	DRAWN BY: E GERMANI IV	DATE: 3/13/02
				APPROVED BY: ALAN M. CORVI, P.E. CITY ENGINEER/DEPUTY D.P.W.	DATE: 3/13/02
					SCALE: NTS



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DEPARTMENT OF PUBLIC WORKS
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BITUMINOUS BERM



NOTES:

1. SHALL BE IN ACCORDANCE WITH SECTION 805 OF THE R.I.D.O.T. STANDARD SPECIFICATIONS.
2. BITUMINOUS BERM CAN BE PLACED AT THE SAME TIME THAT THE SURFACE COURSE LAYER IS PLACED ON THE PROJECT ROADWAY, OR IT CAN BE INSTALLED IN A SEPARATE OPERATION.

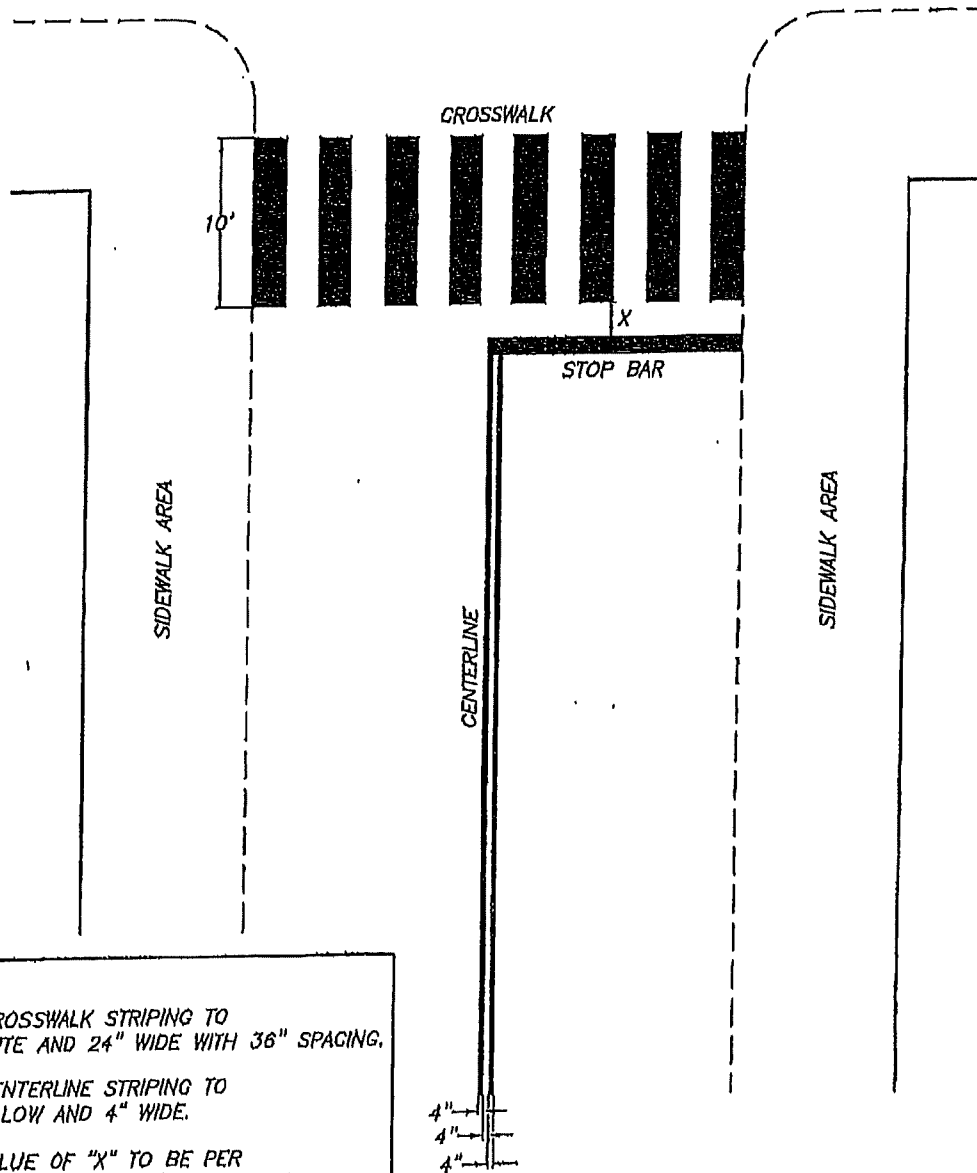
REV. BY	DATE	REV. BY	DATE	DRAWN BY: KAREN LANOUE	DATE: 04/18/02
				APPROVED BY: ALAN CORVI, P.E. CITY ENGINEER	DATE: 04/18/02
					SCALE: NTS



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DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
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TYPICAL ROAD STRIPING (Continental Style)



NOTE:

ALL CROSSWALK STRIPING TO BE WHITE AND 24" WIDE WITH 36" SPACING.

ALL CENTERLINE STRIPING TO BE YELLOW AND 4" WIDE.

THE VALUE OF "X" TO BE PER THE TRAFFIC ENGINEER'S DIRECTION FOR MIDBLOCK CROSSINGS AND 3' FOR CROSSINGS AT INTERSECTIONS

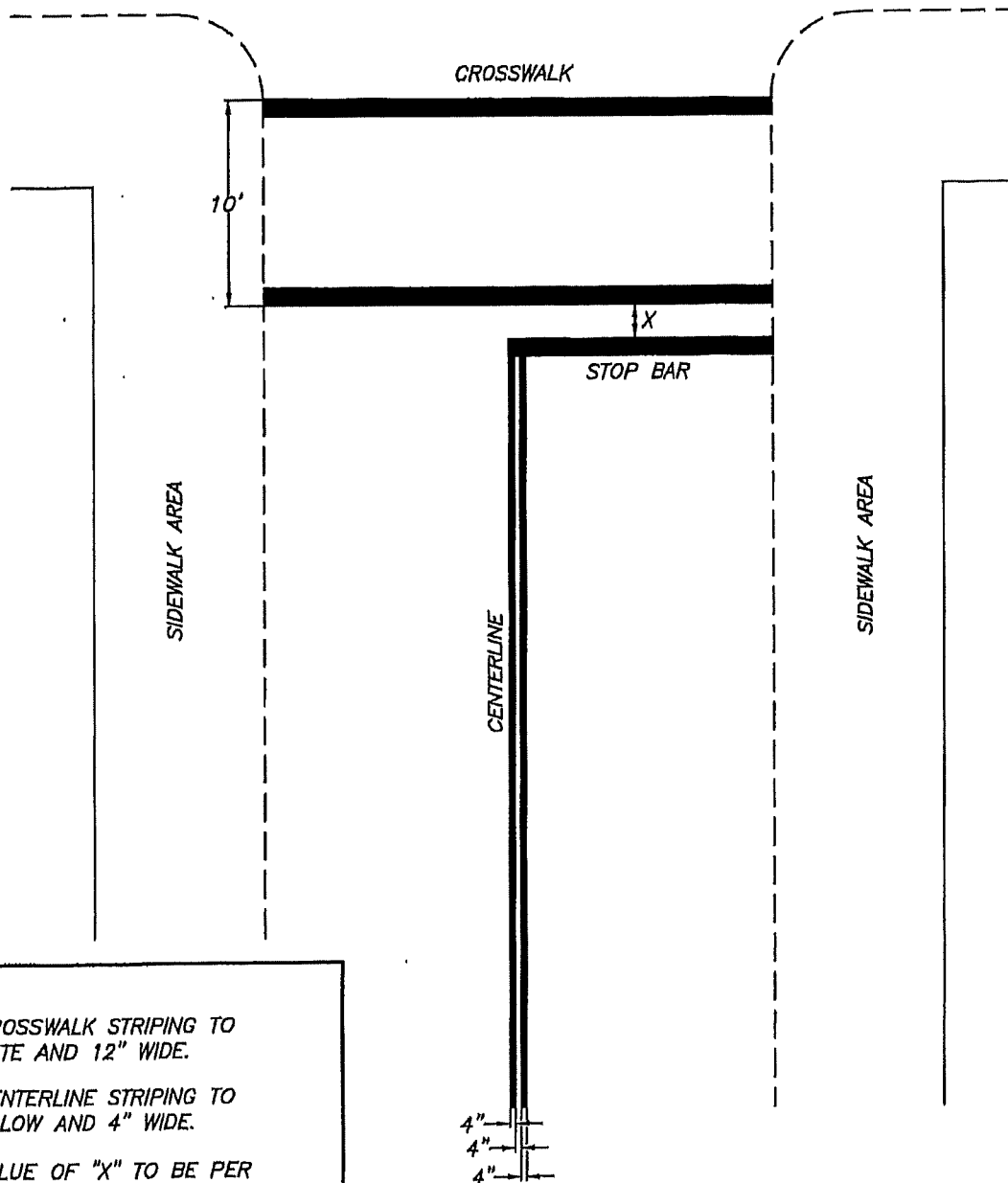
REV. BY	DATE	REV. BY	DATE	DRAWN BY: E. GERMANI IV	DATE: 11/19/14
				APPROVED BY: ERIK G. SKADBERG, P.E.	DATE: 11/19/14
				CITY ENGINEER/DEPUTY D.P.W.	SCALE: NTS



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ENGINEERING DIVISION
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TYPICAL ROAD STRIPING



NOTE:

ALL CROSSWALK STRIPING TO
BE WHITE AND 12" WIDE.

ALL CENTERLINE STRIPING TO
BE YELLOW AND 4" WIDE.

THE VALUE OF "X" TO BE PER
THE TRAFFIC ENGINEER'S DIRECTION
FOR MIDBLOCK CROSSINGS AND
3' FOR CROSSINGS AT INTERSECTIONS

REV. BY	DATE	REV. BY	DATE	DRAWN BY: E. GERMANI IV	DATE: 11/19/14
				APPROVED BY: ERIK G. SKADBERG, P.E. CITY ENGINEER/DEPUTY D.P.W.	DATE: 11/19/14
					SCALE: NTS

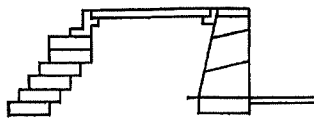


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STANDARD DETAIL**

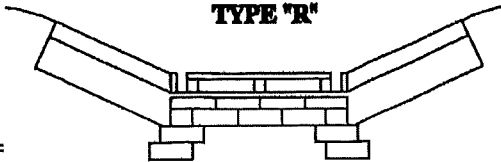


**PRECAST CATCH BASIN
4', 5', OR 6' DIAMETER**

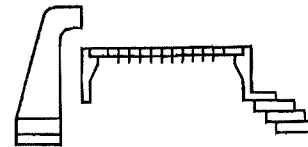
TYPE "D"



TYPE "R"



TYPE "F"

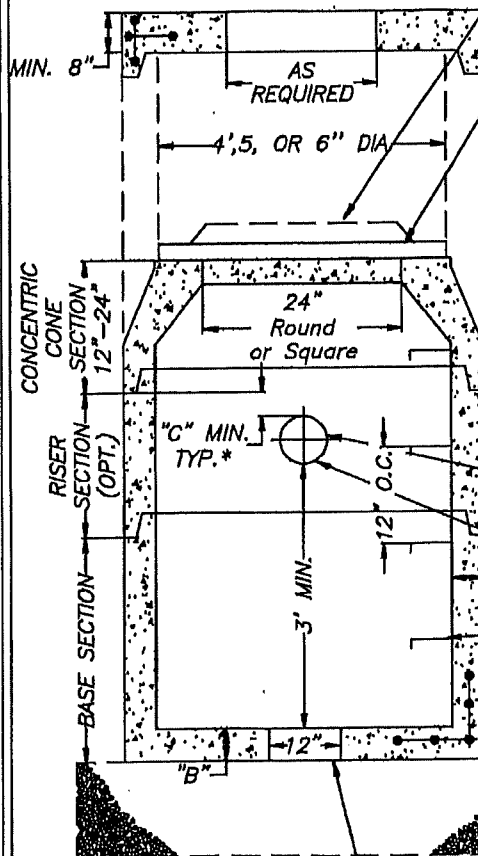


TYPE CATCH BASIN AS REQUIRED

ALTERNATE TOP SLAB IS
STEEL REINFORCED TO MEET
OR EXCEED H-20 LOADING.

CATCH BASIN FRAME AND GRATE
(SEE STD. SERIES C-51 THROUGH C-60)

ADJUST TO GRADE AS REQUIRED USING
RED CLAY BRICK COURSE



GENERAL NOTES

1. REINFORCING STEEL CONFORMS TO LATEST A.S.T.M. A185 SPEC. 0.12 SQ. IN./LINEAL FT. AND 0.12 SQ. IN. (BOTH WAYS) BASE BOTTOM.
2. CONCRETE COMPRESSION STRENGTH 4000 P.S.I. MINIMUM. TYPE II CEMENT.
3. CATCH BASIN DESIGN SPECIFICATIONS CONFORM TO LATEST A.S.T.M. C478 SPEC. FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS."
4. ONE POUR MONOLITHIC BASE SECTION.

MORTAR ALL JOINTS TOTAL WIDTH
OF WALL

PIPE OPENINGS CAST TO PLAN
"A" (SEE STD. C-31)

STEP DESIGN SHALL MEET A.S.T.M. C478
SECTION II SPECIFICATIONS & E.P. STD. C-92

SEE NOTES
1 & 4

*IF OPENING MUST BE CAST
LESS THAN DIST. FROM JOINT
OR THROUGH JOINT, SHOP
DRAWINGS WILL BE REQUIRED.

CATCH BASIN DIAMETER	"A"	"B"	"C"
4'-0"	5"	6"	8"
5'-0"	6"	7"	10"
6'-0"	7"	8"	12"

SEEP HOLE TO BE SEALED
WHEN DIRECTED BY ENGINEER

BASE SECTION TO BE SET
PER JOB SPECIFICATIONS
1' GRAVEL BEDDING

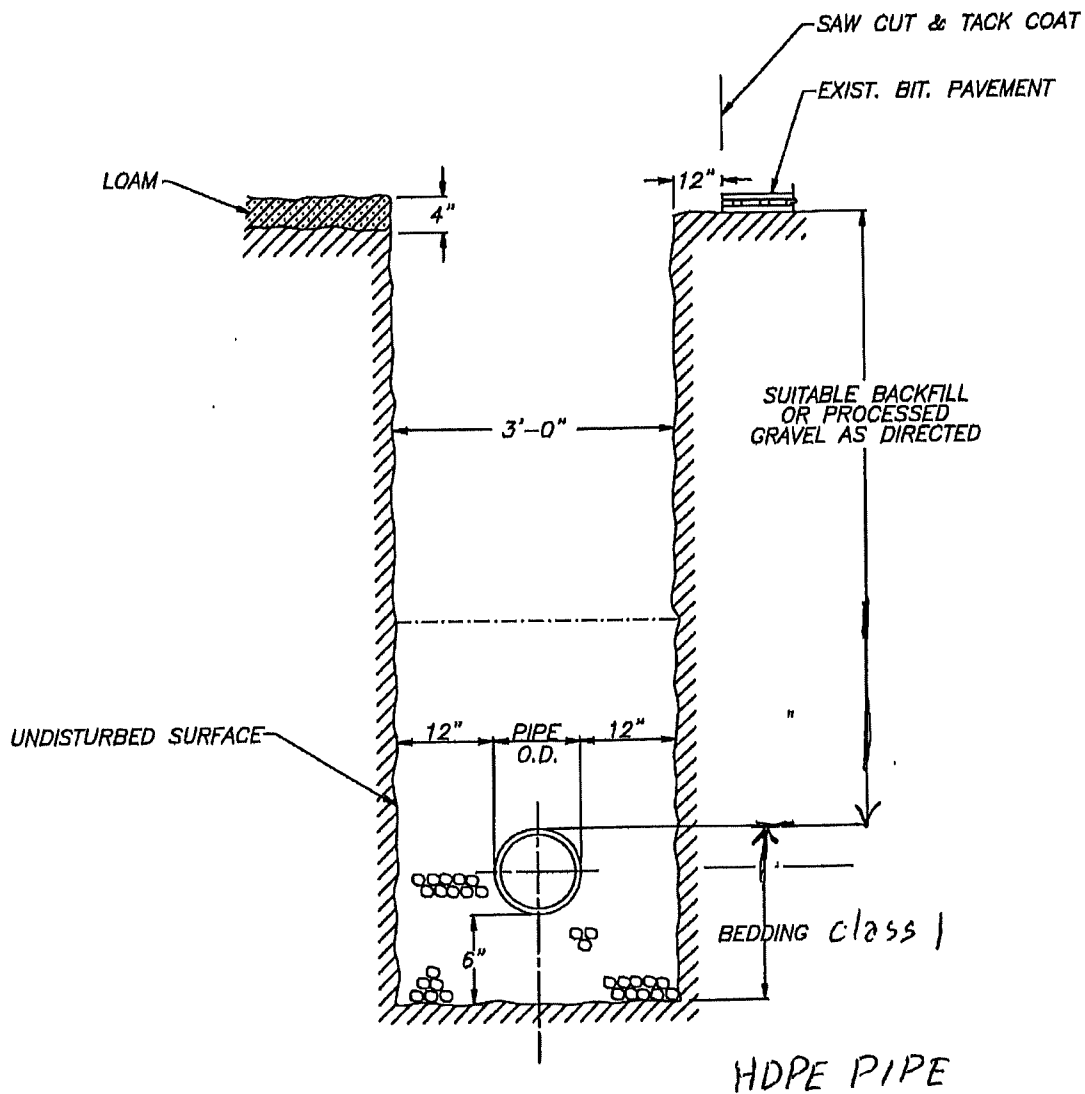
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				APPROVED BY: STEPHEN H. COUTU, P.E.	DATE:
				CITY ENGINEER/DEPUTY D.P.W.	SCALE: NTS



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ENGINEERING DIVISION
STANDARD DETAIL**



PIPE TRENCH DETAIL



NOTE:

1. MINIMUM DEPTH OF COVER SHALL BE **1'-0"**

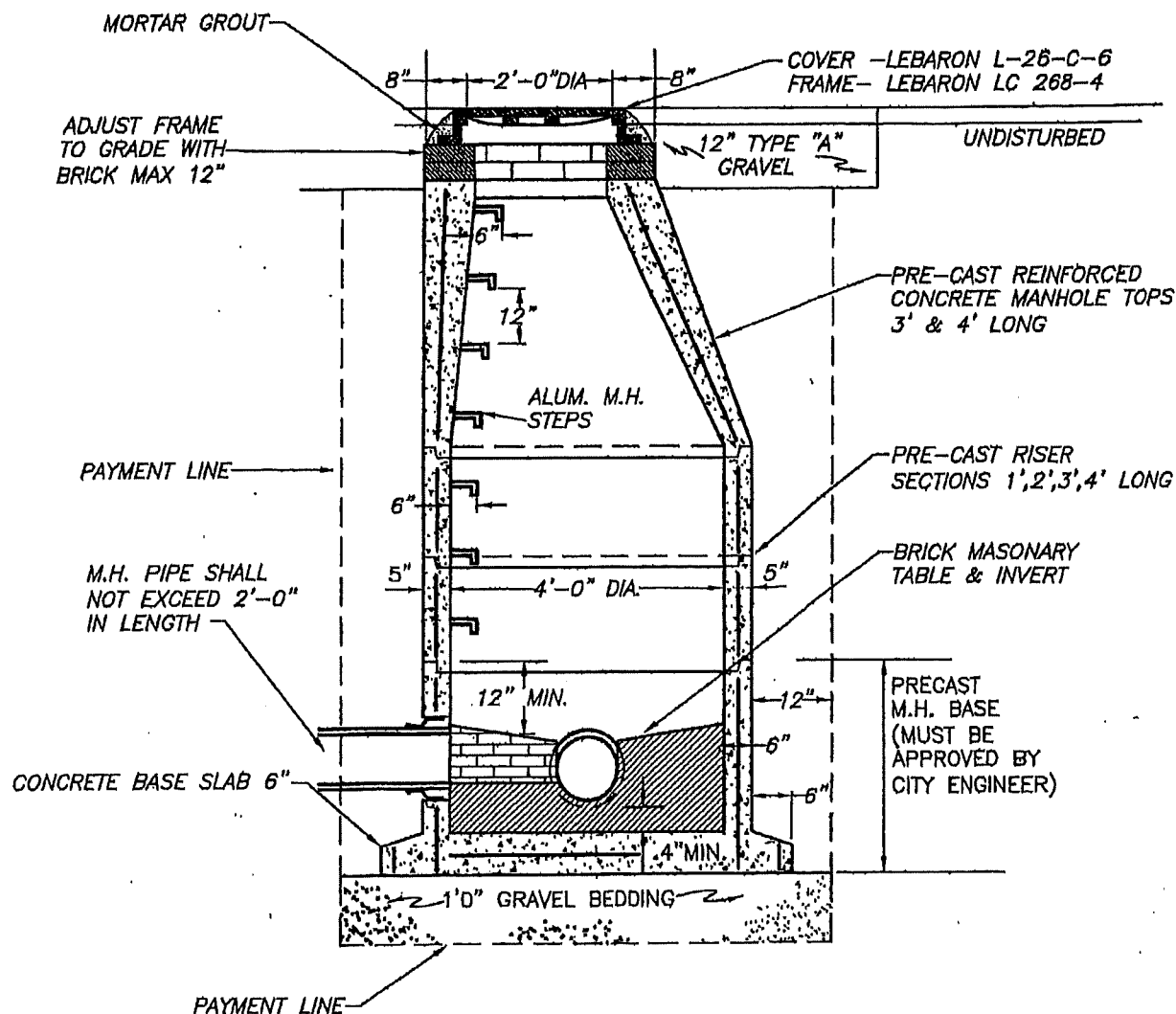
REV. BY	DATE	REV. BY	DATE	DRAWN BY: KAREN LANOUE	DATE: 11/19/99
				APPROVED BY: STEPHEN H. COUTU, P.E. CITY ENGINEER/DEPUTY D.P.W.	DATE:
					SCALE: N.T.S.



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DEPARTMENT OF PUBLIC WORKS
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MANHOLE DETAIL



NOTE: MANHOLE COVERS TO HAVE 2-3/4 INCH HOLES
AND THE LETTERS "EP" EMBOSSED THEREON. (SEE STD C-58)

REV. BY	DATE	REV. BY	DATE	DRAWN BY: REBECCA J. CHAPLIN	DATE: 4/17/01
				APPROVED BY: STEPHEN H. COUTU, P.E.	DATE: 4/17/01
				CITY ENGINEER/DEPUTY D.P.W.	SCALE: NTS