City of Rochester, New York
Department of Environmental Services

STANDARD CONSTRUCTION CONTRACT DOCUMENTS

NOVEMBER 1, 1991
$25.00

CITY OF ROCHESTER

DEPARTMENT OF ENVIRONMENTAL SERVICES

STANDARD CONSTRUCTION CONTRACT DOCUMENTS

Thomas P. Ryan, Jr.

Mayor

Edward J. Doherty

Commissioner,

Dept. of Environmental Services

George H. Stam, P.E.

City Engineer

TABLE OF CONTENTS

TABLE OF CONTENTS

PAGE

Instructions On The Use Of The Standard Construction Contract Documents

1. Standard and Supplementary Documents IN-1
2. Specifications IN-1

Instructions To Bidders

1. Charge or Deposit Required IB-1
2. Qualifications of Bidders IB-1
3. Inspections and Review of Documents Before Submitting Bids IB-1
4. Communications and Interpretations Given Prior to Opening of Bids IB-2
5. Requirements for Bid Deposit IB-2
6. Subcontractors and Assignments IB-2
7. Unit Price Contract IB-3
8. Lump Sum Bids IB-3
9. Requirements for Preparation and Submission of Bids IB-3
10. Opening Procedure for Bid IB-4
11. Owner's Discretion to Accept, Reject or Waive Bid IB-4
12. Basis of Award IB-6
13. Notice of Award IB-6

Bonds and Insurance Forms

Bid Bond BI-1
Performance Bond BI-2
Labor and Material Payment Bond BI-5
Certificate of Insurance BI-9

Laws and Regulations

1. Equal Opportunity LR-1
2. Compliance with Policies Prohibiting Discrimination LR-2
3. Compliance with Labor Laws LR-2
4. Worker Adjustment and Retraining Notification Act ("Plant Closing" Law) LR-2
5. Anti-Kickback Rules LR-2
6. Withholding of Payment from Contractor LR-3
7. Discrimination Because of Certain Labor Matters LR-3
8. Child Labor LR-3
9. Safety and Health Requirements LR-3
10. Compliance With Air and Water Laws and Regulations LR-4
11. Federal Aid LR-6
12. Employees Not to Benefit LR-6
13. Status as an Independent Contractor LR-6

PAGE

14. Political Activity Prohibited LR-6
15. Lobbying Prohibited LR-6
16. Content of Sub-Agreements LR-7

General Terms and Conditions

Index GC-1
Article 1. Definitions and Abbreviations GC-4
Article 2. Contract Documents: Intent and Reuse GC-16
Article 3. Project Start-up GC-18
Article 4. Bonds and Insurance GC-19
Article 5. Availability of Lands; Physical Conditions; Reference Points GC-22
Article 6. Contractor's Responsibilities GC-24
Article 7. Work by Others GC-34
Article 8. City of Rochester's Responsibilities GC-34
Article 9. City Engineer's and Project Manager's Status During Construction GC-35
Article 10. Changes During the Contract GC-38
Article 11. Warranty and Guarantee; Tests and Inspections; Correction, Removal or Acceptance of Defective Work GC-46
Article 12. Termination GC-49
Article 13. Payments to Contractors GC-52
Article 14 Project Closeout GC-54
Article 15. Availability of Funds GC-55
Article 16. Law and Forum GC-55
Article 17. No Waiver GC-55
Article 18. Severability GC-55

SPECIFICATIONS

NEW YORK STATE STANDARD SPECIFICATIONS S-1
CITY OF ROCHESTER STANDARD SPECIFICATIONS S-5

SECTION R200 EARTHWORK

R203 Excavation and Embankment S-19
R204 Milling S-22
R205 Pavement Base Repair S-25
R206 Trench and Culvert Excavation S-27
R207 Pavement Fabric S-31

PAGE

SECTION R400 BITUMINOUS PAVEMENT

R404 Recycled Asphalt Concrete Pavement S-34
R406 Pavement Key S-36
R407 Tack Coat S-37
R408 Coating Bituminous Pavement S-39
R412 Temporary Pavement S-41

SECTION R500 RIGID PAVEMENTS

R504 Portland Cement Concrete S-43
R505 Brick Pavement Restoration S-45

SECTION R550 STRUCTURES

R590 Window Well S-48
R591 Sidewalk Hatch S-49
R592 Areaway Abandonment S-50
R593 Excavation Over Existing Areaway Roof S-54

SECTION R600 INCIDENTAL CONSTRUCTION

R601 Sewer Lateral and Connection S-56
R604 Catch Basin and Manhole S-65
R605 Underdrain S-70
R607 Fencing S-73
R608 Sidewalk and Driveway S-76
R609 Curb S-84
R610 Hydroseeding, Seeding, Shredded Bark, Mulch, and Pea Gravel S-91
R611 Planting S-96
R614 Care of Plants S-101
R615 Landscape Miscellaneous S-105
R616 Tree Planter S-109
R619 Maintenance and Protection of Traffic S-111
R622 Saw Cutting S-113
R624 Concrete Gutter S-114
R626 Survey Monuments S-117
R642 Pavement Marking Paint S-122
R643 Post S-123
R653 Fire Alarm Base S-125
R655 Frame and Grate S-126
R671 Street Lighting System S-128
R685 Plastic Pavement Marking S-138
R687 Alkyd Thermoplastic Pavement Marking S-140

PAGE

SECTION R900 WATER FACILITIES

R901 Ductile Iron Pipe Water Main and Fittings S-147
R902 Gate Valve with Valve Box S-155
R904 Tapping Sleeve, Tapping Saddle and Tapping Valve with Valve Box S-158
R905 Cutting-in Valve with Valve Box and Sleeve S-161
R906 Insertion Sleeve S-163
R907 Connect New Water Main to Existing Water Main S-165
R908 Cut Plug Existing Water Main S-167
R909 Valve Box S-169
R912 Corporation Stop and Connection, Abandon at Tap (2 Inch and Smaller) S-172
R913 Copper Water Service (2 Inch and Smaller) S-175
R914 Curb Stop and Box S-179
R915 Relocate Water Service Meter S-183
R916 Temporary Bypass S-185
R917 Hydrant S-187

MONROE COUNTY PURE WATERS STANDARD SPECIFICATIONS S-192

MONROE COUNTY TRAFFIC ENGINEERING STANDARD SPECIFICATIONS S-224

DETAILS

City of Rochester Standard Details D-1

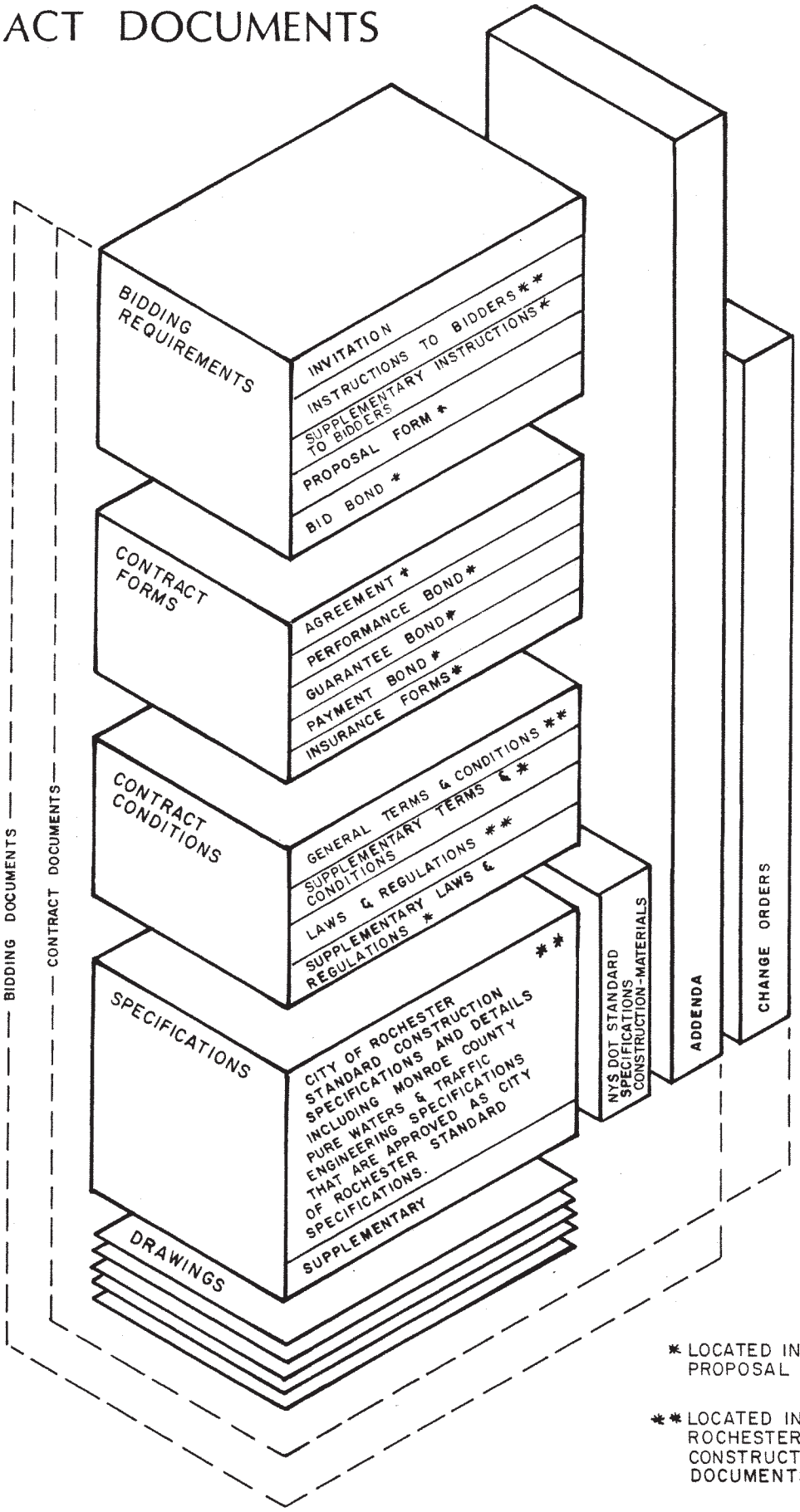
APPENDIX

Standard Specification Item Listing APP-1

INSTRUCTIONS ON THE USE OF STANDARD CONSTRUCTION CONTRACT DOCUMENTS

CITY OF ROCHESTER

CONTRACT DOCUMENTS



* LOCATED IN CONTRACT PROPOSAL BOOK

** LOCATED IN CITY OF ROCHESTER STANDARD CONSTRUCTION CONTRACT DOCUMENTS

INSTRUCTIONS ON THE USE OF THE STANDARD CONSTRUCTION CONTRACT DOCUMENTS

1. Standard and Supplementary Documents

The City of Rochester has adopted uniform Construction Contract Documents to be utilized for the construction of Projects within the City. These documents are divided into two groups: Standard Documents and Supplementary Documents. Contractors must refer to both Standard and Supplementary Documents to bid on and perform the work for a Project.

The City's Standard Documents are published in this volume entitled, Standard Construction Contract Documents, November 1, 1991 Edition, which consist of Instructions to Bidders, Bonds and Insurance Forms, Laws and Regulations, General Terms and Conditions, Specifications, and Details. The specifications include standard City specifications and Monroe County Traffic and Pure Waters specifications that are approved for use in City projects. This volume and all addenda to it can be purchased from the City of Rochester, Purchasing Department, City Hall, Rochester, New York. It is not necessary to purchase a separate volume of Standard Documents for each Project. In addition, a volume of the New York Department of Transportation Standard Specifications: Construction and Materials, January 2, 1990 Edition, is also required as it is incorporated into the City of Rochester Standard Construction Contract Documents by reference. All Contractors are advised to read and become familiar with the Standard Documents since the provisions will apply on all Projects performed in the City of Rochester which call for their use.

The Supplementary Documents are prepared for each Project and consist of the Contract Proposal Book, any Addenda and the Contract Drawings. The Contract Proposal Book consists of Supplementary Instructions to Bidders, Proposal, Agreement, Bonds and Insurance Forms (blanks to be filled out for a specific Project), Supplementary Terms and Conditions, Supplementary Laws and Regulations, and Supplementary Specifications.

The Supplementary Documents pertain to specific conditions that exist for a particular Project and list any deviations from the Standard Documents. When Contractors purchase Supplementary Documents from the City of Rochester for a particular Project, they will receive two (2) sets of Proposal Sheets. One (1) set will be bound with the Contract Proposal Book and one (1) set will be loose. The Contractor shall submit the loose set with the Bid Bond as the bid.

2. Specifications

2.1 General

The New York State Department of Transportation (NYSDOT) Standard Specifications: Construction and Materials, January 2, 1990 Edition, is incorporated in the City of Rochester's Standard Specifications by reference. Particular City specifications may refer to sections of the NYSDOT specifications or NYSDOT specifications in their entirety may be approved for use in City projects. This publication may be purchased from the New York State Department of Transportation.

Standard Specifications approved for use in City of Rochester Projects have item numbers that denote the governmental body that wrote the specification and its source. When a NYSDOT specification is being referenced, the item number appears with no prefix. The specification can be found in the NYSDOT Standard Specifications: Construction and Materials. When a City of Rochester specification is referenced, the item number appears with a "R" prefix and is found in the City of Rochester Standard Construction Contract Documents. These specifications may modify a NYSDOT specification or be complete with no reference to a NYSDOT specification. County specifications that have been selected as standard items for City projects appear with a "C" prefix and are found in the City of Rochester Standard Construction Contract Documents. These usually include a reference to a NYSDOT specification. Nonstandard item numbers may appear in a a Contract-Proposal Book. These have a "S" prefix. This denotes a nonstandard specification that can be found in the Supplementary Specification Section of the Contract-Proposal Book. The Contractor is advised that whenever there is a City specification, it will supersede the corresponding

NYSDOT specification. Therefore, any references in a NYSDOT specification to another NYSDOT specification requires reference to the corresponding City specification, if one has been written.

2.2 Terms, Titles and Abbreviations in NYSDOT Specifications

When applying NYSDOT Standard Specifications: Construction and Materials, unless otherwise indicated, Sections 102 through 109 of the NYSDOT Standard Specifications shall not apply. Terms, titles and abbreviations in Section 101 identical to those in the City's General Terms and Conditions shall take on the meaning defined in the City's General Terms and Conditions. Whenever the following terms, titles or abbreviations are used or referred to in a New York State specification referenced by the City, the following substitutions should be made:

Section 101-01 Abbreviations -

1. Delete D.C.E.C., D.C.E.D., D.C.E.S., and D.C.E.T.S. and replace with City Engineer.

2. Delete E.I.C. and replace with Project Manager.

Section 101-02.2 Amendment - Delete and replace with Addenda as defined in the General Terms and Conditions.

Section 101-07 Chief Engineer - Delete and replace with City Engineer.

Section 101-08 Commissioner - Delete and replace with City Engineer.

Section 101-09 Comptroller - Delete and replace with Director of Finance.

Section 101-10 Contract Agreement - Delete and replace with Agreement as defined in the General Terms and Conditions.

Section 101-11 Contract Bond - Delete and replace with Performance Bond as defined in the General Terms and Conditions.

Section 101-16 Department - Delete and replace with City.

Section 101-17 Departmental Soils Engineer - Delete and replace with City Engineer or a Soils Engineer of the City or NYSDOT acting at the request of the City Engineer.

Section 101-18 Departmental Engineering Geologist - Delete and replace with City Engineer or a Geologist working at the request of the City Engineer.

Section 101-19 Division - Delete and replace with City Engineer.

Section 101-21 Engineer or Engineer-in-Charge - Delete and replace with Project Manager.

Section 101-23 Executive Deputy Commissioner - Delete and replace with City Engineer.

Section 101-30 Inspector - Delete and replace with Project Representative as defined in the General Terms and Conditions.

Section 101-33 Material - Delete and replace with Material approved by the NYSDOT, or the City Engineer, and conforming to the requirements of the Specifications.

Section 101-34 Materials Bureau - Delete and replace with Materials Bureau of the NYSDOT or a testing laboratory approved by the City.

Section 101-36 Order on Contract - Delete and replace with Change Order as defined in the General Terms and Conditions.

Section 101-36.1 Office of Engineering - Delete and replace with Engineering Services, Department of Environmental Services, City of Rochester.

Section 101-37 Partial or Monthly Estimates - Delete and replace with Partial or Progress Payments as defined in the General Terms and Conditions.

Section 101-41 Proposal Form - Delete and replace with Proposal Form on which the City of Rochester requires Bids to be prepared and submitted for the work.

Section 101-44 Regional Director - Delete and replace with City Engineer.

Section 101-51.1 Soil Mechanics Bureau - Delete and replace with Soil Mechanics Bureau of the NYSDOT or a soils testing laboratory approved by the City.

Section 101-53.1 Standard Sheets - Delete and replace with Standard Detail Drawings.

Section 101-58 Test - Delete and replace with Methods adopted by the NYSDOT and approved by the City Engineer to ascertain the quality, character and acceptability of materials and processes utilized in performing the Project.

2.3 Terms, Titles and Abbreviations in Monroe County Specifications

Unless otherwise indicated, when Monroe County Specifications reference NYSDOT specifications, the terms, titles, and abbreviations used in the previous section shall apply.

When applying Monroe County Pure Water Standard Specifications, the General Provisions for Pure Waters found on pages S-198 through S-200 also must be referenced. If these general provisions impact or contradict the City's General Terms and Conditions for a particular phase of work, then the more rigorous of the two shall apply.

All references in the Monroe County Pure Waters and Traffic Specifications to Engineer shall be deleted and replaced with Project Manager.

2.4 Materials

The appropriate NYSDOT Departmental Publications Tests, Control Methods, Materials and Material Requirements indicated or referred to in each section of the specifications shall apply to the work items in the Standard Construction Contract Documents. If the Design Professional has specified a particular material in the Supplementary Specifications and on the Drawings, no substitutions shall be allowed by the Project Manager unless the qualifications of "Section 6.3 Equivalent Products", of the General Terms and Conditions are met. If no particular material is specified by the Design Professional, the Contractor may use any of the materials allowed in the Specifications. If no particular material is listed in the Specifications, the Contractor may use any material currently approved by the NYSDOT unless it is determined unsuitable by the City Engineer. The Contractor shall submit proof of NYSDOT material approval to the Project Manager prior to its use in the work. Materials, control methods and sources not currently approved by NYSDOT shall require the approval of the NYSDOT or the City Engineer prior to their use in the work.

INSTRUCTIONS TO BIDDERS

INSTRUCTIONS TO BIDDERS

1. Charge or Deposit Required

A charge of fifty dollars ($50.00) shall be made to the Bidder for each set of the Drawings and Contract Proposal Book for each Project unless otherwise specified in the Notice to Bidders and/or the Supplementary Instructions to Bidders. The Drawings and Contract Proposal Book may be purchased from the Purchasing Agent of the City of Rochester. If a Bid is duly submitted by a Bidder who has purchased Drawings and Contract Proposal Book and such Bid is accompanied by proper Bid deposit, the full amount of the cost for one copy of the Drawings and Contract Proposal Book and one-half (1/2) the cost of subsequent sets shall be refunded to the Bidder, if the copy or copies of Drawings and Contract Proposal Book used by such Bidder are returned to the Purchasing Agent in good condition within thirty (30) days following the Award of Contract. Non-bidders who return one set of Drawings and Contract Proposal Book within 30 days following the Bid opening, will be refunded one-half (1/2) cost of the deposit. Drawings and Contract Proposal Books may be inspected at the Office of the Purchasing Agent, City Hall, 30 Church Street, Rochester, New York, 14614.

2. Qualifications of Bidders

In the event that the City shall require certified supporting data regarding the qualifications of the Bidder in order to determine whether the Bidder is a responsible Bidder, the Bidder will be required to complete and furnish a Confidential Questionnaire within forty-eight (48) hours of the request of the Purchasing Agent. A sample of the Confidential Questionnaire is attached to the Proposal. On the Confidential Questionnaire the Bidder will be required to list:

A. The Bidder's performance record;

B. The address and description of the Bidder's plant and place of business, principals of the firm and detailed account of work committed;

C. An itemized list of equipment in inventory. Such list shall include the age and condition of the equipment;

D. A description of any similar projects which the Bidder has constructed in a satisfactory manner and other pertinent information.

The Purchasing Agent may also request the Bidder to furnish within forty-eight (48) hours a certified or authenticated financial statement, dated within thirty (30) days prior to the opening of Bids. The City may require that any items be further verified. The Bidder agrees to permit the City to verify the line of credit extended to the Bidder by banks or other financial institutions. The City may also use the services of a national mercantile agency such as Dunn & Bradstreet, Inc., in checking financial responsibility. The Bidder agrees further that the City will incur no liability as the result of this procedure.

3. Inspections and Review of Contract Documents Before Submitting Bid

Before submitting a Bid, each Bidder must be fully satisfied as to the work called for in the Contract Documents, and as to the condition of the site, such as: topography; character of soil, including the existence of rock; poles, pipes, wires, and other facilities; and the existence of structures privately owned, or of municipal and other public service corporations on, over, or under the site which may interfere with, or make more difficult the performance of the Project. The signature of the Bidder upon the Bid shall constitute a certification to the City that such Bidder: is fully informed regarding all the conditions affecting the work to be done; that such information was secured by personal investigation and research; and that the Bidder accepts full responsibility for the Bid prices submitted.

Upon request, the City will provide each Bidder access to the site to conduct such investigations and tests as each Bidder deems necessary for submission of a Bid.

4. Communications and Interpretations Given Prior to Opening of Bids

Any information relative to interpretation of the Contract Proposal Book and Drawings shall be requested of the Purchasing Agent, in writing. Any interpretation made to prospective Bidders will be expressed in the form of an Addendum to the Contract Proposal Book which will be sent by ordinary or certified mail, at the City's option, to all prospective Bidders no later than five (5) calendar days before the date set for opening of Bids. No Addenda will be issued on inquiries received within seven (7) calendar days prior to the date set for the opening of the Bid. DO NOT MAKE INQUIRIES BY PHONE OR IN PERSON.

5. Requirements for Bid Deposit

Each proposal shall be on the form PROPOSAL furnished in the Contract Proposal Book; shall comply with the requirements stated thereon and shall be accompanied by a bid bond executed by a Surety company authorized to transact business in the state of New York, in the amount of five (5) percent of the total Bid. In lieu of the said bond, a certified check, cash or an irrevocable letter of credit in the same amount may be submitted. After the Bids have been opened the Purchasing Agent may retain the Bid Deposits of all Bidders and, in any event, the Purchasing Agent shall retain the Bid Deposits of the three lowest responsive Bidders. In no event, however, shall the Purchasing Agent retain the Bid deposit of any except the three lowest responsive Bidders for a period in excess of ten days after the date the Bids are opened. As soon as the Agreement, as awarded to the successful Bidder, has been fully executed and the bonds and insurance required thereunder have been filed and approved by the City, the Bid Deposit shall be returned to the remaining two lowest responsive Bidders.

The Purchasing Agent, after the Bids have been tabulated, shall either award the Contract to the lowest responsible Bidder or the Purchasing Agent may reject all Bids. If all Bids are rejected, the Purchasing Agent shall return the Bid deposits accompanying them. If the Bidder to whom this Contract is awarded fails to furnish the required bonds or execute the Agreement, the Bidder's Bid deposit shall be forfeited to the City in partial satisfaction of damages.

If the City has not awarded the Agreement within forty-five (45) days after the opening of the Bids through no fault of the Bidder, the Bidder may demand the return of the Bid deposit, unless the Bidder has been notified by the City in writing of the acceptance of the Bidder's Bid.

6. Subcontractors and Assignments

In order to insure the quality of the work and to prevent brokerage, the City may, in the Supplementary Terms and Conditions, require the apparent low Bidder, prior to the Notice of Award, to identify in writing to the City those portions of the work that such Bidder proposes to subcontract; and after the Notice of Award, the Bidder may only subcontract other portions of the work with the City's written consent.

No Contractor shall be required to employ any specific Subcontractor, other person or organization.

If the Supplementary Terms and Conditions require the identity of certain Subcontractors, other persons and organizations to be submitted to the City in advance of the Notice of Award, the apparent low Bidder, and any other Bidder so requested, will within seven (7) days after the day of the Bid opening submit to the City a list of all Subcontractors, other persons and organizations (including those who are to furnish the principal items or material and equipment) proposed for those portions of the work as to which such identification is so required. Such list shall be accompanied by an experience statement with pertinent information as to similar projects and other evidence of qualification for each such Subcontractor, other person and organization if requested by the City. If the City after due investigation, has reasonable objection to any proposed Subcontractor, other person or organization, it shall, before the giving of the Notice of Award, request the apparent low Bidder to submit an acceptable substitute without an increase in Bid price. If the apparent low Bidder declines to submit such substitution, the Contract may not be awarded to such Bidder, but the Bidder's declining to make any such substitution will not constitute grounds for forfeiting the Bidder's Bid deposit. Any Subcontractor, other person or organization so listed and to whom the City does not make written objection prior to the giving of the Notice of Award, will be deemed acceptable to the City.

The Contractor may not assign, transfer, convey, sublet, subcontract or otherwise dispose of this Contract, or of the Contractor's right, title or interest therein or the Contractor's power to execute such Contract, to any other person, firm or corporation without the prior written consent of the City. Any attempted assignment transfer, etc., without the prior written approval of the City, shall be void. The Contractor further may not assign any monies due hereunder without the written consent of the City. This Contract shall inure to the benefit of, and shall be binding upon, the parties hereto, and upon the parties respective successors and assigns. The foregoing provision as to subletting any portion of the work, shall not apply when done in accordance with the Contract Documents.

7. Unit Price Contract

In the event that the Contract is a unit price contract, the Bidder's attention is called to the fact that the quantities of work to be done and the materials to be furnished under the specifications, as shown on the Proposal, are approximate, and are given only as a guide for preparing bids and awarding contracts. This applies whether or not borings are indicated or available for inspection. Grades and alignments shown on the Drawings may be modified at the direction of the Project Manager. The City does not guarantee that the estimated quantities there given, or the grades and alignment shown on the Drawings, shall apply strictly in the construction of the work. Payment on unit price Contracts will be based on actual quantities of work performed at the unit prices in the Contract. If the Bidder, in making up and submitting a bid, relies upon the accuracy of said estimated quantity, the Bidder does so at his own risk.

Unit prices must be plainly stated in figures by the Bidder, unless, both figures and words are called for. When both figures and written words are employed, the written words shall govern, and shall be used to determine the amount of the Bid.

8. Lump Sum Bids

In the event that the Contract involves a lump sum bid, the Contractor shall furnish the City, immediately after the execution of the Agreement, a schedule of values for such lump sum bid. The City reserves the right at its discretion, to accept or adjust the items appearing in such schedule. After acceptance of the items appearing in the schedule, the same shall constitute the basis for making partial payments to the Contractor.

Proposals for lump sum bids shall be completed by the Bidder using both figures and written words indicating the amount of such bid. In case of discrepancies between the figures and the words, the written words shall govern, and shall be used to determine the amount of the bid.

9. Requirements for Preparation and Submission of Bids

Bids shall be submitted only on the forms provided by the City.

Any bids, amendments thereto, or requests for withdrawal of Bids received by the City after the time specified for the Bid opening, will not be considered.

A written request for the withdrawal of a Bid, or any part thereof, may be granted if the request is received by the City prior to the specified time of opening.

Bids must be submitted sealed and should include on the face of the envelope the name and address of the Bidder, Project name and/or number, and opening date and time. Bids not received in the office of the Purchasing Agent by the time established for Bid opening will not be considered, even if mailed earlier.

All information required by the Instructions to Bidders and Supplementary Instruction to Bidders must be supplied to constitute a formal Bid.

All Bids submitted shall be binding for no less than forty-five (45) days following the Bid opening date.

When an error is made in extending total prices, the written unit Bid price will govern. Carelessness in quoting prices, or in preparation of the Bid, will not relieve the Bidder. Erasures or changes in Bids should be initialed by the Bidder.

The reference to a name brand is intended to be descriptive, but not restrictive, and to only indicate to the prospective Bidder articles that will be satisfactory. The Bidder intending to use other articles should be aware that the Purchasing Agent may reject the bid, if the articles the Contractor proposes to furnish contain variations from the specification requirements.

No Bidder will be allowed to offer more than one (1) price on each item even though the Bidder may feel that there are two (2) or more types or styles that will meet the specifications. Bidders must determine for themselves which to offer. Submission of more than one (1) price for any item shall be grounds for rejection of the bid.

The Bidder is advised that, unless otherwise specified in the Supplementary Instructions to Bidders, the Bidder should take into account the rate of inflation when determining Bid prices. Increases in the costs of overhead, materials, or labor during the course of the Project shall not be cause for an increase in the Contract price except as noted in Section 10.2.6 regarding the Asphalt Price Index in the General Terms and Conditions of the Standard Construction Specifications.

The Bidder's attention is directed to Section 6.8 of the General Terms and Conditions regarding the City's tax exempt status.

Bids by corporations must be executed in the corporate name by a corporate officer. The Bid shall be accompanied by a duly executed acknowledgement of authority to sign with a corporate seal affixed. The corporate address and State of incorporation shall be shown below the signature.

Bids by partnerships must be executed in the partnership name and signed by a partner whose title must appear under the signature. They shall be accompanied by a duly executed acknowledgement of authority to sign. The official address of the partnership must be shown below the signature.

10. Opening Procedure for Bid

Sealed Proposals, endorsed with the name of the Bidder (and also stating the Bidder's address) will be received by the Purchasing Agent of the City of Rochester, New York, in City Hall, at 30 Church Street, at which place the Proposals will publicly be opened and read. Notices of all addenda to the Contract Documents shall be posted at the time of issuance and copies of all addenda will be available in the Office of the Purchasing Agent for review prior to the Bid opening.

When Bids are opened, the Bids will be read aloud. An abstract of the accounts of the base Bids and major alternates (if any) will be made available (upon request) after the Bid award.

11. Owner's Discretion to Accept, Reject or Waive Bid

The Purchasing Agent shall at the time and place specified in the Notice to Bidders, publicly open and read all Bids received for the work, or return all Bids to the original Bidders unopened. The City reserves the right, without liability, to reject all Bids and return the Bid deposits, or to waive any minor informality or irregularity in Bids received whenever such waiver is in the interest of the City.

Where alternates are called for in the Proposal form, the City may at its discretion elect to accept or reject any such alternate. Unless otherwise specified in the Supplementary Instructions to Bidders, the low Bidder will be the Bidder submitting the lowest total price for the basic Project and the alternate(s) selected by the City.

Any one (1) or more of the following causes may be considered sufficient for the disqualification of a Bidder and the rejection of the Bidder's Bid or Bids:

A. Evidence of collusion among Bidders.

B. Lack of competency as revealed by either financial, experience, or plant equipment statements as submitted.

C. Lack of responsibility as shown by past work, judged by the City from the standpoint of workmanship or progress.

D. Uncompleted work under other Contracts, which in the judgment of the City, might hinder or prevent the prompt completion of additional work if awarded.

E. Being in arrears on existing Contracts, in litigation with the City, or having defaulted on a Contract awarded by the City or other public agency.

F. Having filed false affidavits at the time of final estimate on a previous Contract.

G. Other information obtained by the Purchasing Agent having a bearing on a Bidder's responsibility.

H. Appearance of the Bidder's name on a State, Local or Federal list of debarred, ineligible, disqualified Contractors.

I. The Purchasing Agent further reserves the right to reject any Bid, unless it contains an adequate and reasonable price for all items contained in the Proposal form.

Bids which are incomplete, conditional or obscure by reason of additions not called for, erasures, alterations or irregularities of any kind, may be rejected by the City. No Bid will be accepted which does not contain a unit price or lump sum price for every item shown on the Proposal form.

The contractual terms, conditions and provisions of these Contract Documents, including all General Terms and Conditions and Instructions to Bidders, shall not be modified by the Bidder. The Purchasing Agent shall have the right at, the Purchasing Agent's option, to reject any Bid submitted with additional or differing Contract provisions, or to ignore such additional provisions, and to award as if such additional provisions had not been submitted by the Bidder. This paragraph shall not apply if the Notice to Bidders or the Contract Documents specifically invite the Bidder to submit additional or modifying provisions, but only to the extent that such additional or modifying provisions are requested by and are acceptable to the Purchasing Agent. Where the Bidder submits a Bid for goods or services which vary from the City's specifications, the decision of the Purchasing Agent of whether such goods or services are functionally equivalent to the goods or services requested by the City shall be final.

Unit prices shall each carry a proportionate share of the total Project cost. Unreasonably high, low, or disproportionate unit prices may be cause for rejection of the Bid. If two (2) or more bidders submit identical Bids and are equally qualified, the decision of the City to make award to one (1) or more of such Bidders shall be final. Selection may be made by drawing lots. Price and other factors being equal, preference may be given first to resident Bidders, except when in the judgment of the City such selection would operate to the disadvantage of the City. Then, selection by drawing lots shall not apply where the tie Bids are between a resident and a non-resident Bidder. A resident Bidder shall be defined as one whose principal office is located in the County of Monroe, New York.

12. Basis of Award

The Contract will be awarded to the lowest responsible Bidder complying with the provisions of the Instructions to Bidders and Supplementary Instructions to Bidders.

The City may conduct such investigations as it may deem necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of the Bidders, in accordance with the Contract Documents to the City's satisfaction within the prescribed time.

13. Notice of Award

The Purchasing Agent shall award the Contract to the lowest responsible Bidder or reject all Bids and return the Bid deposits. A written Notice of Award (or Acceptance of Bid) mailed (or otherwise furnished) to the successful Bidder shall be deemed to constitute a binding Contract.

No Bid may be withdrawn until forty-five (45) days have elapsed after the opening of the Bids. A Bid shall be considered withdrawn only upon receipt of written notice of withdrawal from the Bidder by the Office of the Purchasing Agent prior to issuance of the Notice of Award.

BONDS AND INSURANCE FORMS

BID BOND

Bond Number _____

KNOW ALL PERSONS BY THESE PRESENTS:

That _____ of _____

_____ as Principal, and _____

_____ a corporation

organized and existing under the laws of _____

_____ and authorized to do business in the State of New York, as Surety, are held and firmly bound

unto _____ as Obligee, in the full and just sum of

_____ dollars ($_____), lawful money of the United States, for the payment of which sum, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these present.

WHEREAS, the said Principal is herewith submitting its proposal.

THE CONDITION OF THIS OBLIGATION is such that if the aforesaid Principal shall be awarded the contract the said Principal will, within the time required, enter into a formal contract and give a good and sufficient bond to secure the performance of the terms and conditions of the contract, then this obligation to be void; otherwise the Principal and Surety will pay unto the Obligee the difference in money between the amount of the bid of the said Principal and the amount for which the Obligee legally contracts with another party to perform the work if the latter amount be in excess of the former, but in no event shall liability hereunder exceed the penal sum hereof.

Signed, sealed and delivered _____
Date

_____ (Seal)

_____ _____ (Seal)

_____
Attorney-in Fact

PERFORMANCE BOND

Bond Number _____

KNOWN TO ALL PERSONS BY THESE PRESENTS:

That _____ as Principal, hereinafter called Principal, and _____ a corporation organized and existing under the laws of _____ and authorized to do business in the State of New York as Surety, hereinafter called Surety, are held and firmly bound unto _____ as Obligee, hereinafter called Obligee, in the amount of

_____ dollars ($_____), for payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement dated _____, 19____, entered into a contract with Obligee for _____

_____

in accordance with drawings and specifications prepared by _____ which contract is by reference made a part hereof, and is hereinafter referred to as the contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Principal shall promptly and faithfully perform said contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Whenever Principal shall be, and be declared by Obligee to be in default under the contract, the Obligee having performed Obligee's obligation thereunder:

(1) Surety may promptly remedy the default subject to the provisions of paragraph 3 herein; or

(2) Obligee after reasonable notice to Surety, or Surety upon demand of Obligee, may arrange for the performance of Principal's obligation under the contract subject to the provisions of paragraph 3 herein;

(3) The balance of the contract price, as defined below, shall be credited against the reasonable cost of completing performance of the contract. If completed by the Obligee, and the reasonable cost exceeds the balance of the contract price, the Surety shall pay to the Obligee such excess, but in no event shall the aggregate liability of the Surety exceed the amount of this bond. If the Surety arranges completion or remedies the default, that portion of the balance of the contract price as may be required to complete the contract or remedy the default and to reimburse the Surety for its outlays shall be paid to the Surety at the times and in the manner as said sums would have been payable to Principal had there been no default under the contract. The term "balance of the contract price" as used in this paragraph, shall mean the total amount payable by Obligee to Principal under the contract and any amendments thereto, less the amounts heretofore properly paid by Obligee under the contract.

Any suit under this bond must be instituted before the expiration of two (2) years from date on which final payment under the contract falls due.

The Surety hereby waives any notice of a change in the contract price or contract time.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the Obligee named herein or the heirs, executors, administrators or successors of the Obligee.

Signed and sealed this _____ day of _____, 19____.

_____

By _____
Principal

By _____
Surety

INDIVIDUAL ACKNOWLEDGEMENT

STATE OF:
COUNTY OF: SS:
CITY OF:

On this _____ day of _____, 19____, before me personally appeared the within named _____ to me known to be the individual described in, and who executed the same.

_____
Notary Public

PARTNERSHIP ACKNOWLEDGEMENT

STATE OF:
COUNTY OF: SS:
CITY OF:

On this _____ day of _____, 19____, before me personally came _____ to me known and known to me to be a member of the firm of _____ the firm described in, and which executed, the foregoing instrument and said _____ acknowledged that the foregoing instrument was executed for and in behalf of said firm, and who executed the same.

_____
Notary Public

CORPORATE ACKNOWLEDGEMENT

STATE OF:
COUNTY OF: SS:
CITY OF:

On this _____ day of _____, 19____, before me personally came and appeared _____ to me known, who, being by me duly sworn, who did depose and say is a resident of _____ who is the _____ of _____ the corporation described in and which executed the above instrument; who knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation; and that whose signature was affixed thereto by like order.

_____
Notary Public

(2) The abovenamed Principal and Surety hereby jointly and severally agree with the Owner that every Claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such Claimant's work or labor was done or performed, or materials were furnished by such Claimant, may sue on this bond for the use of such Claimant, prosecute the suit to final judgment for such sum or sums as may be justly due Claimant and have execution thereon. The Owner shall not be liable for payment of any costs or expenses of any such suit.

(3) No suit or action shall be commenced hereunder by any Claimant,

(a) Unless Claimant, other than one having a direct contract with the Principal, shall have given written notice to any two (2) of the following: the Principal, the Owner, or the Surety above named, within ninety (90) days after such Claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, Owner or Surety, at any place where an office is regularly maintained for the transaction of business or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer.

(b) After the expiration of one (1) year following the date on which Principal ceased work on said contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

(c) Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the project, or any part hereof, is situated, or in the United States District Court for the district in which the project, or any part thereof, is situated, and not elsewhere.

(4) The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against this bond.

LABOR AND MATERIAL PAYMENT BOND

Bond Number _____

KNOW ALL PERSONS BY THESE PRESENTS:

That _____ as Principal, hereinafter called Principal, and _____ a corporation organized and existing under the laws of _____ and authorized to do business in the State of New York, as Surety, hereinafter called Surety, are held and firmly bound unto _____ as Obligee, hereinafter called Owner, for the use and benefit of Claimants as hereinbelow defined, in the amount of _____ dollars ($_____), for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement dated _____, 19____, entered into a contract with Owner for _____

_____

in accordance with drawings and specifications prepared by _____

_____ which contract is by reference made a part hereof, and is hereinafter referred to as the contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal shall promptly make payment to all Claimants as hereinafter defined, for labor and material used or reasonably required for use in the performance of the contract, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

(1) A Claimant is defined as one having direct contract with the Principal or with the Subcontractor of the Principal for labor, material or both, used or reasonably required for use in the performance of the contract; labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental of equipment directly applicable to the contract.

The Surety hereby waives any notice of a change in the contract price or contract time.

Signed and sealed this _____ day of _____, 19____

_____

_____ (Seal)
Principal

_____ (Seal)
Surety

INDIVIDUAL ACKNOWLEDGEMENT

STATE OF:
COUNTY OF: SS:
CITY OF:

On this _____ day of _____, 19____, before me personally appeared the within named _____ to be the individual described in, and who executed the same.

_____
Notary Public

PARTNERSHIP ACKNOWLEDGEMENT

STATE OF:
COUNTY OF: SS:
CITY OF:

On this _____ day of _____, 19____, before me personally came _____ to me known and known to me to be a member of the firm of _____ the firm described in, and which executed, the foregoing instrument and said _____ acknowledged that the foregoing instrument was executed for and in behalf of said firm, and who executed the same.

_____
Notary Public

CORPORATE ACKNOWLEDGEMENT

STATE OF:
COUNTY OF: SS:
CITY OF:

On this _____ day of _____, 19____, before me personally came and appeared _____ to me known, who, being by me duly sworn, who did depose and say is a resident of _____ who is the _____ of _____ the corporation described in and which executed the above instrument; who knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation; and that whose signature was affixed thereto by like order.

_____
Notary Public

CITY OF ROCHESTER

CERTIFICATE OF INSURANCE

To the City of Rochester:

The subscribing insurance company certifies that insurance of the kinds and types and for limits of liability not less than those herein stated, covering the work herein designated, has been procured by and furnished on behalf of the insured Contractor named in Item 1.

1. Name of Insured _____

Address of Insured _____

2. Location and Description of Work _____

_____

_____

3. Kinds and Types of Insurance:

TYPES OF INSURANCE	POLICY NUMBER	EFFECTIVE DATE	EXPIRATION DATE	LIMITS OF LIABILITY
CONTRACTOR'S GENERAL LIABILITY -Comprehensive Form -Independent Contractors -Premises Operation -Completed Operations Hazard -Broad Form Property Damage -Underground Hazard -Explosion and Collapse Hazard -Contractual Insurance				
MOTOR VEHICLE INSURANCE				
BUILDER'S ALL RISK INSURANCE				
WORKER'S COMPENSATION INSURANCE				
DISABILITY INSURANCE				

Such insurance as is herein certified applies to all operations of said insured in connection with the work herein described at the locations stated, and is written in accordance with the company's regular policies and endorsements, subject to the company's applicable manuals of rules and rates in effect, except _____

_____

The insurance provided by the subscriber shall include the City of Rochester as an additional insured.

No exclusion from coverage shall be made for any municipal operations performed as a term of the contract for which this insurance is issued.

The subscribing company agrees that no policy referred to herein shall be changed or cancelled until ten (10) days written notice has been given to the City of Rochester.

This certificate is furnished in accordance with and for the purpose of the specifications of the City of Rochester covering the operations herein described.

_____
(Name of Company)

_____

_____
(Address of Company)

By _____
(Authorized Representative)

Dated _____

LAWS AND REGULATIONS

LAWS AND REGULATIONS

1. Equal Opportunity

The City of Rochester, New York reaffirms its policy of equal opportunity in its commitment to require all Contractors, lessors, vendors and suppliers doing business with the City of Rochester to follow a policy of equal opportunity, in accordance with the requirements set forth herein. This policy is adopted pursuant to the City's Affirmative Action Plan, Article XV, Contract Compliance. The City further does not discriminate on the basis of handicap status as defined in 31 CFR, Part 51, in admission or access to, or treatment or employment in its programs and activities. The City is including these policy statements in all Bid documents, contracts, and leases. Contractors, lessors, vendors and suppliers shall agree to comply with all State and Federal Equal Opportunity Laws and Regulations and Federal Regulation 31 CFR, Part 51 and shall submit documentation regarding Equal Opportunity upon the City's request.

A. The Contractor agrees to not discriminate against any employee for employment because of race, color, religion, sex, age, national origin, or handicap status as defined in 31 CFR, Part 51. The Contractor agrees to make a good faith effort to employ minority group persons and females and that in hiring of an employee for performance of work under this Agreement of any subcontracting hereunder, the Contractor, and his Subcontractors, if any, shall not, by reason or age, race, creed, color, sex, age, national origin, or handicap status as defined in 31 CFR, Part 51, discriminate against any person who is qualified and available to perform the work to which the employment relates. The Contractor agrees to take affirmative action to insure that applicants are employed and that employees are treated during their employment, without regard to their race, color, religion, sex, age, national origin, or handicap status as defined in 31 CRF Part 51. Such actions shall include, but is not limited to the following: employment, upgrading, demotion or transfer; recruitment advertising, layoff or termination; rate of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor shall post in conspicuous places, available to employees and applicants or employment, notice to be provided by the City setting forth the provisions of this non-discrimination clause.

B. The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age, national origin, or handicap status as defined in 31 CFR Part 5l.

C. If the Contractor is found guilty of discrimination in employment on the grounds of race, color, sex, national origin, age, or handicap status as defined in 31 CFR Part 5l by any court or administrative agency that has jurisdiction pursuant to any State or Federal Equal Opportunity rules or regulations, such determination will be deemed to be a breach of Contract, and this Agreement will be terminated in whole or in part without any penalty or damages to the City on account of such cancellation or termination, and the Contractor shall be disqualified from hereafter selling to, submitting Bids to, or receiving awards of Contract with the City of Rochester for goods, work, or services until such time as the Contractor can demonstrate its compliance with this policy and all applicable Federal and State Equal Opportunity laws and regulations.

D. The Contractor shall cause the foregoing provisions to be inserted in all subcontracts, if any, for any work covered by this Agreement so that such provisions will be binding upon each Subcontractor, provided that the foregoing provisions shall not apply to subcontracts for standard commercial supplies or raw materials.

2. Compliance with Policies Prohibiting Discrimination

A. Anti-Apartheid Policy

The Council of the City of Rochester, New York has reaffirmed its commitment to racial equality and has established, in Ordinance Number 85-133, a policy prohibiting any City agency or department from contracting for goods or services with any company or person who supports a policy of apartheid as defined

herein except where competitive bidding is required by the General Municipal Law. The Contractor agrees to not support a policy of apartheid as defined herein.

SUPPORTS A POLICY OF APARTHEID shall mean providing loans directly to, underwriting securities of, advertising or otherwise promoting the sale of gold on behalf of, or otherwise providing financial services to the government of the Republic of South Africa or its agencies.

B. Fair Employment in Northern Ireland

The Contractor agrees to observe Ordinance Number 88-19 of the City of Rochester, which condemns religious discrimination in Northern Ireland and requires persons contracting to provide goods and services to the City to comply with the principles of fair employment without religious discrimination and public monitoring of fair employment practices.

A copy of the MacBride Principles is on file in the Office of the Director of Finance.

3. Compliance with Labor Laws

The Contractor's attention is directed to the requirements of Section 220 and 220-a through 220-e and 240 of the Labor Law of the State of New York, compliance with the provisions of which shall be deemed a condition to the satisfactory performance of this Agreement.

The Contractor shall cause to be posted and maintained at all times in a conspicuous place at the site of the work a clearly legible copy of the schedule of wage rates as prescribed by the State Commissioner of Labor. The Contractor shall further certify on any statement to the City for a partial or final payment that the wage rates paid to employees in this Project have been in conformity with the wage rates so set forth as determined by the State Commissioner of Labor pursuant to and in conformity with Section 220 of the New York State Labor Law.

The Contractor shall keep a copy of the payrolls for this Project available at all times for inspection by a representative of the City or other public agency having jurisdiction over the Project, and shall produce them for such inspection at the request of said duly authorized representatives. The Contractor and Subcontractors shall submit weekly such certified payroll records to the Project Manager, for transmission to the City's Director of Finance or named designee. The Contractor shall be responsible for the submission of copies of certified payrolls of all Subcontractors. Payments shall be withheld from the Contractor for failure to comply with this requirement.

The Contractor shall comply with the construction site workers' protection statutory requirements contained in Section 240 of the Labor Law of the State of New York.

In all operations related to the work, all other State or Federal laws, local ordinances and laws, controlling or limiting in any way the action of those engaged in the work, shall be strictly complied with by the Contractor, the Subcontractors of the Contractor, and all employees working under their direction.

4. Worker Adjustment and Retraining Notification Act ("Plant Closing" Law)

The Contractor and Subcontractor shall comply with the Worker Adjustment and Retraining Notification Act in relation to plant closings and mass layoffs.

5. Anti-Kickback Rules

Employees of the Contractor and Subcontractors performing work under this Agreement shall be paid unconditionally and not less often than once a week without deduction or rebate on any account except only such payroll deductions that are mandatory by law or permitted by the applicable regulations issued by the State Commissioner of Labor pursuant to the New York Labor Law. The Contractor shall comply with the applicable "Anti-Kickback" regulations and shall insert appropriate provisions in all subcontracts covering work under this agreement to insure compliance by Subcontractors with such regulations, and shall be responsible for the submissions of affidavits required of Subcontractors thereunder except as the Commissioner of Labor may specifically provide for variations of or exemptions from the requirements thereof.

6. Withholding of Payments from Contractor

When a notice is filed with the City of Rochester alleging the failure of a Contractor or Subcontractor to pay or provide the prevailing wages or supplements, or when the City of Rochester has reason to believe that unpaid wages or supplements may be due, payments on the public work Contract may be withheld from the prime Contractor in sufficient amount to satisfy the alleged unpaid wages and supplements, including interest and civil penalty which may be imposed.

The amounts withheld may be disbursed by the City of Rochester for and on account of the Contractor or Subcontractor to the respective employees to whom they are due.

7. Discrimination Because of Certain Labor Matters

No person employed on the work covered by this Agreement shall be discharged or in any way discriminated against because the person has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify at any proceeding relating to the labor standards applicable hereunder to that person's employer.

8. Child Labor

The Contractor shall comply with Resolution Number 37-38 of the City of Rochester regarding the use of child labor.

9. Safety and Health Requirements

A. General

The Contractor shall perform all work in the Contract Documents in a workmanlike manner with due regard to the safety of the employees and of the public. The Contractor shall comply with all rules, regulations and standards of the Occupational Safety and Health Administration (OSHA), U.S. Department of Labor in the performance of the work required by the Contract Documents in all matters regarding the safety and protection of persons employed in construction, excavation and demolition work. The Contractor shall also meet all applicable requirements of the State of New York Department of Labor, Industrial Code Rule 53 regarding construction, excavation and demolition operations at or near underground facilities.

B. Drilling and Blasting

A Project meeting relative to the method, manner and procedure of blasting operations shall be held at the site with the Project Manager, the Contractor and representatives of all interested agencies, prior to the commencement of drilling and blasting operations. Whenever explosives are used, they shall be of such character and strength and in such amounts as is permitted by OSHA standards, State and local laws and ordinances and all respective agencies having jurisdiction over them. In special cases the right is reserved for the Project Manager and those agencies to specify the maximum size of the charges when a less than regularly allowed maximum charge is desired.

Blasting shall be done only at such time as the Project Manager and those agencies shall approve and under such restrictions as they may impose.

The Contractor shall employ only experienced supervisors and workers in the handling, loading and firing of the explosives. The Contractor shall fulfill the requirements of the City of Rochester Fire Prevention Code Article X, Section 53-88 to Section 53-106 regarding explosives and blasting agents which, together with other conditions indicated herein shall provide for the possession, handling, storage, transportation, and use of all explosives used at the site. Overnight storage of explosives within the City limits is prohibited unless authorized in writing by the City of Rochester Fire Marshall.

C. Explosives in Demolition

Demolition work, subject to the requirements of OSHA standards and New York State Industrial Code Rule 53, shall not be performed by the use of explosives unless a specific variation for such use be granted in writing to the Contractor by the City of Rochester Fire Marshall.

D. Excavation and Prohibition of Blasting Near Public and Private Utility Pipes.

1) No Contractor or person representing the Contractor shall start construction, excavation or demolition, (other than a State, County or City employee regularly engaged in the maintenance and repair thereof), in any then existing street, highway or public place, unless notice thereof shall have been given at least forty-eight (48) hours and not more than ten (10) days in advance to the person, corporation or agency engaged in the distribution of gas, oil, electricity, steam or water, or the provision of telephone, telegraph or cable television service in such territory. The person having direction or control of such work shall give such notice and further shall ascertain whether there is within one hundred (100) feet of such street, highway or public place, or in the case of a proposed and authorized discharge of explosives within a radius of two hundred (200) feet of such discharge, any pipe of any other person, corporation or agency conveying combustible gas. If there be any such pipe, the Contractor shall also give notice to any such other person, corporation or agency. In any emergency involving danger to life, health or property it shall be lawful to excavate without using explosives if the notices prescribed herein are given as soon as reasonably possible. Any such work shall be performed in such manner as to avoid damage to any utility facilities.

2) If in the course of any such excavation, blasting, or other work, damage or the potential thereof is occasioned to any utility facility used in the transmission or distribution of gas, electricity, water, steam, telephone, telegraph, or cable, television, whether by direct contact, undermining of soil or other support thereof, or otherwise, the person having direction or control of such work shall promptly take all reasonable measures necessary to protect individuals and the public from loss, or the potential thereof, and shall immediately notify the person, corporation or agency owning or operating such utility of such damage or potential damage to its facilities. Neglect on the part of the Contractor or any person representing the Contractor having direction or control of such Work, (responsible for any damage or potential damage to such facilities): (a) to take such safety precaution measures as are necessary or reasonably required promptly; or (b) to immediately notify the owner or operator of the utility facility involved of damage or potential damage to its facilities, occasioned by such person or under this person's direction or control, shall be a violation of these requirements.

Nothing herein contained shall preclude or prevent recovery of monetary damages by the owner or operator of the utility facility involved, or by any other person suffering damage from the disruption of utility services occasioned by excavation, blasting or other Work in the vicinity thereof.

E. Asbestos and Hazardous Material

The Contractor shall comply with Article 30 of the New York State labor law in the handling of asbestos and other hazardous material.

10. Compliance With Air and Water Laws and Regulations

The Contractor and any and all Subcontractors agree as follows:

A. The Contractor, and its Subcontractors warrant that any facility to be utilized in the performance of any non-exempt Contract or subcontract is not listed on the List of Violating Facilities issued by the U.S. Environmental Protection Agency (EPA) pursuant to 40 CFR 15.20. A condition for the award of the Contract is that prompt notice will be given to the City of any notification received from the Director, Office of Federal Activities, EPA, indicating that a facility utilized or to be utilized for the Project is under consideration to be listed on the EPA List of Violating Facilities.

B. The Contractor warrants to the City that the Contractor has not been convicted under Section lll(c)(1) of the Clean Air Act or Section 309(c) of the Federal Water Pollution Control Act.

C. The Contractor promises to comply with all the requirements of Sections 144 of the Clean Air Act, as amended (47 USC1857c-8) and Section 308 of the Federal Water Pollution Control Act, as amended (33 USC 1318) relating to the inspection, monitoring, entry, reports and information as well as all other requirements specified in Section 144 and Section 308, and all regulations and guidelines issued thereunder.

D. Air Pollution Abatement. The Contractor is put on notice that there will be no burning of trees, rubbish or other material by the Contractor during this Agreement. Normal burning of fuels in operation of construction equipment is exempt here except as the construction work is affected by the requirements of the Public Health Law (Air Pollution Control) and Chapter IV, Air Pollution Control of the Official Compilation of Codes, Rules and Regulations of the State of New York, Title 10, and local regulations, which are to be met.

E. Soil Erosion and Water Pollution Abatement. The Contractor shall schedule and conduct its operations to minimize erosion of soils and to prevent silting and muddying of streams, rivers, irrigation systems, impoundments (lakes, reservoirs, etc.) and lands adjacent to or affected by the work. Construction of drainage facilities and performance, or other work, which will contribute to the control of erosion and sedimentation shall be carried out in conjunction with earthwork operations, or as soon thereafter as practicable. The area of bare soil exposed at any one time by construction operations shall be kept to a minimum.

Whenever the Contractor's operations, carried out in accordance with the approved schedule, result in a situation where temporary erosion control measures not shown on the Drawings must be taken, these measures are to follow the requirements set forth herein and be approved by the Project Manager.

In carrying out erosion control measures, the Contractor will be guided by, but not limited to, the following controls:

1) When borrow material is obtained from other than commercially operated sources, erosion of the borrow site shall be so controlled both during and after completion of the work that erosion will be minimized and sediment will not enter streams or other bodies of water. Waste or disposal areas and construction roads shall be located and constructed in a manner that will keep sediment from entering streams.

If directed by the Project Manager, the Contractor shall submit grading plans for all borrow areas, waste and disposal areas to the Project Manager for approval prior to the start of work on or the use of such areas. The objective of the grading plan is to insure stability of the slopes and provide a pleasing appearance in conformity with the surrounding landscape. The areas shall be seeded, mulched and fertilized as provided for in the Contract Documents. All of the above work shall be done at the Contractor's expense.

2) Frequent fording of live streams will not be permitted; therefore, temporary bridges or other structures shall be used wherever an appreciable number of stream crossings are necessary. Unless otherwise approved in writing by the Project Manager, mechanized equipment shall not be operated in live streams.

3) When work areas or gravel pits are located in or adjacent to live streams, such areas shall be separated from the main stream by a dike or other barrier to keep sediment from entering a flowing stream. Care shall be taken during the construction nd removal of such barriers to minimize the muddying of a stream.

4) All waterways shall be cleared as soon as it is practicable of falsework, piling, debris or other obstructions placed during construction operations and not a part of the finished work.

Ditches which are filled or partly inoperative shall be cleaned and made operative before the Contractor stops work for any day and shall be maintained in a condition satisfactory to the Project Manager for the duration of the Agreement.

5) Water from aggregate washing or other operations containing sediment shall be treated by filtration, settling basin or other means sufficient to reduce the sediment content to not more than that of the stream into which it is discharged.

6) Pollutants such as fuels, lubricants, bitumens, raw sewage and other harmful materials shall not be discharged into or near rivers, streams, and impoundments or into natural or manmade channels leading thereto. Wash water or waste from concrete mixing operations shall not be allowed to enter live streams.

7) All applicable regulations of fish and wildlife agencies and statutes relating to the prevention and abatement of pollution shall be complied with in the performance of the Agreement.

F. When it becomes necessary, the Project Manager will inform the Contractor of unsatisfactory construction procedures and operations insofar as erosion control, water and air pollution are concerned. If the unsatisfactory construction procedures and operations are not corrected promptly, the Project Manager may suspend the performance of any or all of other construction until the unsatisfactory condition has been corrected.

11. Federal Aid

In all Agreements in which the Federal government participates financially, (these Agreements are designated as Federal-Aid Contracts), the Contractor shall conform in all respects in accordance with the true intent and meaning of each and all of the requirements contained in the "Federal Provisions", which will be found incorporated in the Supplementary Laws and Regulations section of the Contract Proposal Book. When any of such Federal Provisions may be in conflict with any other provisions of the Contract Documents the Federal Provisions shall prevail and take precedence and be of force over and against any said conflicting provisions of said Contract Documents.

12. Employees Not to Benefit

The Contractor warrants that no employee or officer of the City, or member of the elected governing body has received or has been promised, directly or indirectly, any financial benefit, by way of fee, commission, finder's fee, political contribution, or any other similar form of remuneration on account of the acts of awarding and/or executing the Agreement. Any Agreement made or entered into where it is discovered that violation intent of this provision exists shall be declared null and void and all monies received by the Contractor shall be returned to the City.

Any person violating the provisions of this Article shall be subject to prosecution.

13. Status as an Independent Contractor

The Contractor, in accordance with its status as an independent Contractor, warrants that it will conduct itself in a manner consistent with such status, that it will neither hold itself nor its employees out as, nor claim to be an officer or employee of the City by reason hereof, and that it and its employees will not by reason hereof, make any claim, demand or application for any right or privilege applicable to an officer or employee of the City, including but not limited to Worker's Compensation coverage, unemployment insurance benefits, social security coverage, and retirement membership or credit.

14. Political Activity Prohibited

None of the funds, material, property, or services provided directly or indirectly under this Agreement shall be used during the performance of this Agreement for any partisan political activity, or to further the election or defeat of any candidate for public office.

15. Lobbying Prohibited

None of the funds provided under this Agreement shall be used for publicity or propaganda purposes designed to support or defeat legislation pending before the United States Congress, the Legislature of the State of New York or the Council of the City of Rochester.

16. Content of Sub-Agreements

The Contractor agrees that all sub-agreements authorized by this Agreement shall be in written form. The Contractor shall require all to comply with any of the following articles which may be in this Agreement: Equal Opportunity; Affirmative Action and Employment of Local Labor; Compliance with Labor Laws; Certifications Regarding Conflicts of Interest; Anti-Kickback Rules; Interest of City and Contractor in Contract. It is the purpose of this Article to insure that all Agreements obligate all parties performing work under this Agreement to comply with necessary governmental programs and policies. The City may require the Contractor to submit copies of such sub-agreements to the City. If such copies are not submitted upon request, the City may have the right to withhold any and all payments to the Contractor for those items of work in which this Article has not been complied with.

GENERAL TERMS AND CONDITIONS

GENERAL TERMS AND CONDITIONS
INDEX

		PAGE
ARTICLE 1.	DEFINITIONS AND ABBREVIATIONS	GC-4
1.1	Definitions	GC-4
1.2	Abbreviations	GC-10
ARTICLE 2.	CONTRACT DOCUMENTS: INTENT AND USE	GC-16
2.1	Intent; Order of Precedence	GC-16
2.2	Use	GC-16
2.3	Copies of Documents	GC-17
ARTICLE 3.	PROJECT START-UP	GC-18
3.1	Delivery of Bonds	GC-18
3.2	Commencement of Contract Time	GC-18
3.3	Before Starting Construction	GC-18
3.4	Preconstruction Meetings	GC-18
3.5	Public Meetings	GC-18
ARTICLE 4.	BONDS AND INSURANCE	GC-19
4.1	Bonds	GC-19
4.2	Insurance	GC-20
4.3	Contractual Liability Insurance	GC-21
4.4	Waiver of Rights	GC-21
4.5	Receipt and Application of Proceeds	GC-21
4.6	Partial Utilization - Property Insurance	GC-21
ARTICLE 5.	AVAILABILITY OF LANDS; PHYSICAL CONDITIONS; REFERENCE POINTS	GC-22
5.1	Availability of Lands	GC-22
5.2	Physical Conditions - Investigations and Reports	GC-22
5.3	Unforeseen Physical Conditions	GC-22
5.4	Reference Points	GC-22
5.5	Contract Limit Lines	GC-22
5.6	Utilities	GC-22
ARTICLE 6.	CONTRACTOR'S RESPONSIBILITIES	GC-24
6.1	Supervision and Superintendence	GC-24
6.2	Labor, Products, and Storage	GC-24
6.3	Equivalent Products	GC-25
6.4	Concerning Subcontractors and Suppliers	GC-25
6.5	Patents, Copyrights, Patent Fees and Royalties	GC-26

PAGE

6.6 Permits GC-26
6.7 Laws and Regulations GC-27
6.8 Taxes GC-27
6.9 Use of Premises GC-27
6.10 Record Documents and Audits GC-28
6.11 Safety and Protection; Maintenance and Protection of Traffic GC-28
6.12 Emergencies GC-30
6.13 Shop Drawings and Samples GC-30
6.14 Continuing the Work GC-31
6.15 Indemnification GC-32
6.16 Job-Site Meetings GC-32
6.17 Temporary Utilities GC-32
6.18 Surveys and Stakeouts GC-32
6.19 Salvage Materials GC-32
6.20 Historical and Scientific Specimens GC-33

ARTICLE 7. WORK BY OTHERS GC-34

ARTICLE 8. CITY OF ROCHESTER'S RESPONSIBILITIES GC-34

ARTICLE 9. CITY ENGINEER'S AND PROJECT MANAGER'S STATUS DURING CONSTRUCTION GC-35
9.1 The City of Rochester's Representative GC-35
9.2 Visits to the Site GC-35
9.3 Project Manager's Representative - Duties and Responsibilites GC-35
9.4 Clarifications and Interpretations GC-35
9.5 Rejecting Defective Work GC-35
9.6 Shop Drawings, Orders and Payments GC-35
9.7 Resolutions of Disputes GC-36
9.8 Limitations on Project Manager's and Project Representative's Responsibilities GC-36

ARTICLE 10. CHANGES DURING THE PROJECT GC-38
10.1 Changes in the Work GC-38
10.2 Changes in the Contract Price GC-38
10.3 Changes in the Contract Time GC-44
10.4 Liquidated Damages GC-45

PAGE

ARTICLE 11. WARRANTY AND GUARANTEE; TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK GC-46
11.1 Warranty and Guarantee GC-46
11.2 Access to Work GC-46
11.3 Tests and Inspections GC-46
11.4 Uncovering Work GC-47
11.5 City May Stop the Work GC-47
11.6 Correction or Removal of Defective Work GC-47
11.7 Acceptance of Defective Work GC-48
11.8 The City May Correct Defective Work GC-48

ARTICLE 12. TERMINATION GC-49
12.1 Termination for Default GC-49
12.2 Termination for Convenience of City GC-50
12.3 Termination for Public Emergency GC-50
12.4 Contractor's Right to Terminate GC-51

ARTICLE 13. PAYMENTS TO CONTRACTORS GC-52
13.1 Application for Progress Payment GC-52
13.2 Contractor's Warranty of Title GC-52
13.3 Review of Applications for Progress Payments GC-53
13.4 Retainage GC-53

ARTICLE 14. PROJECT CLOSEOUT GC-54
14.1 Request for Substantial Completion Inspection GC-54
14.2 Certificate of Substantial Completion GC-54
14.3 Waiver of Claims GC-54
14.4 Final Completion/Final Payment GC-54
14.5 Contractor's Continuing Obligation GC-55

ARTICLE 15. AVAILABILITY OF FUNDS GC-55

ARTICLE 16. LAW AND FORUM GC-55

ARTICLE 17. NO WAIVER GC-55

ARTICLE 18. SEVERABILITY GC-55

GENERAL TERMS AND CONDITIONS

ARTICLE 1. DEFINITIONS AND ABBREVIATIONS

1.1 Definitions:

Whenever the following words and expressions are used in the City's Contract Documents, the intent and meaning shall be interpreted as follows:

ADDENDA - Written or graphic instruments issued prior to the opening of Bids which clarify, correct or change the Contract Documents.

AGREEMENT - The portion of the Contract Documents which is the written statement between the City and Contractor covering the work to be performed.

APPROVED - Acceptance in writing by the Project Manager.

ARCHITECT - An employee of the City or a Consultant to the City duly authorized by the State of New York to practice in specialized areas of expertise and appointed by the City to provide design, inspection, review or other services relative to the Project.

AREAWAY - An extension of a building which extends into the right-of-way and exists below grade. An Areaway may be a separate chamber separated from the building by a wall or may be an extension of the building without a wall.

AUTHORIZATION - The acceptance in writing by the City Engineer.

AWARD - The acceptance by the City of the Bid of the lowest responsive and responsible Bidder for the Work.

BID - The written offer of the Bidder, when executed and submitted on the approved Proposal form, to perform the contemplated work and furnish the necessary materials in accordance with the provisions of the Contract Documents.

BID DEPOSIT - The security furnished by the Bidder with the Bid for a project, as a guarantee that, if awarded a contract, he will enter into an Agreement and furnish required bonds.

BIDDER - The individual, partnership, corporation, or joint venture formally submitting a Bid for Work contemplated, or any portion thereof, acting directly or through an authorized representative.

BIDDING DOCUMENTS - Both the bidding requirements and contract documents eexcept for the change orders that are required for the bidder to prepare its bid.

BIDDING REQUIREMENTS - These documents notify and instruct bidders in the required procedures to prepare and submit their bids. These include: Invitation to Bid, Instructions to Bidders, Supplementary Insturctions to Bidders, Bid Form and Bid Bond.

CALENDAR DAY- Every day shown on the calendar beginning at 12 midnight prevailing time.

CHANGE ORDER - Written order issued by the City Engineer and agreed to by the Contractor authorizing extra work, increases or decreases and additions, alterations, or deletions to the Contract Documents or adjustments in the Contract Price or contract time. The City may issue a Change Order without the Contractor's agreement if a dispute arises.

CITY - The City of Rochester, Monroe County, New York and wherever appropriate, its agents and representatives.

CITY ENGINEER - The City Engineer of the City of Rochester, New York.

CITY OF ROCHESTER CENTRAL REGISTRY - The master list of operators of underground facilities kept in the Permit Office of the City of Rochester.

CONSULTING ENGINEER AND OTHER CONSULTANTS - A Consultant to the City duly authorized by the State of New York to practice in specialized areas of expertise and appointed by the City to provide design, inspection, review or other services. The Consultant will provide these services under direction of the City Engineer on certain projects.

CONTRACT - The Contract Documents form the Contract. The Contract represents the entire and integrated agreement between the City and the Contractor, and may be modified only by a Change Order.

CONTRACT DOCUMENTS - The Contract Documents shall include all of the following: Contract Proposal Book, Addenda, NYSDOT Standard Specifications: Construction and Materials, City of Rochester Standard Construction Contract Documents, and Drawings whether furnished or incorporated by reference; plus Change Orders and all provisions required by law to be inserted in the Contract Documents, whether inserted or not. This represents the entire and integrated agreement between the City and the Contractor.

CONTRACT LIMIT LINES - The Contract or Project physical boundaries shown on the Drawings.

CONTRACTOR - The individual, partnership, corporation or joint venture undertaking the execution of the work under the terms of the Contract Documents and acting directly or through their or its agents or employees.

CONTRACT PAY ITEM - A specifically described unit of work for which a price is provided in the Contract Documents.

CONTRACT PRICE - The total monies payable by the City to the Contractor under the Contract as stated in the Contract Documents. The Contract Price may be adjusted due to changes in the Work. In a unit Price Contract, the Contract Price may be adjusted according to the actual units completed.

CONTRACT PROPOSAL BOOK - The Contract Proposal Book is the publication that includes the project specific information. This includes Supplementary Instructions to Bidders, Proposal forms, the Agreement, any Supplementary Terms and Conditions or Supplementary Laws and Regulations not included in the Standard Construction Contract Documents and, project specific Supplementary Specifications that define the work to be performed and labor and materials needed.

COUNTY - The County of Monroe, in New York State and wherever appropriate, its agents and representatives.

DAY - Whenever in the Contract Documents "Day" is used without specifying "Calendar Day" or "Working Day", it shall be construed as "Calendar Day" as defined herein.

DESIGN PROFESSIONAL - A designated representative of the City who is responsible for the design of the Project and preparation of the Contract Documents. The Design Professional may be a Consultant or an employee of the City.

DRAWINGS - The official drawings and applicable standard detail sheets which show the location, character, dimensions and details of the work to be performed under the Contract; and which form a part of the Contract Documents.

EMPLOYEE - Any person working on the project mentioned in the Contract Doucuments who is under the direction or control of, or receives compensation from the Contractor or a Subcontractor.

ENGINEER - An employee of the City or a Consultant to the City duly authorized by the State of New York to practice in specialized areas of expertise and appointed by the City Engineer to provide design, inspection, review or other services relating to the Project.

EQUIVALENT - A product, material or method judged by the Project Manager to be equal in quality, value, performance and suitability to that specified in the Contract Documents.

EXTRA WORK - An item of work described in a Change Order which is not provided for in the Contract Documents, but which is found by the City Engineer to be essential to the satisfactory completion of the Project.

FEDERAL PROJECT - An identification applied to federally aided work for the purpose of the records of the Federal Government (HUD, UMTA, et al.).

FIELD ORDER - A written order issued by the Project Manager which orders minor changes in the Work. A Field Order may result in changes in the number of units in a unit price Contract and/or the addition of contingency items if allowed in the Contract. A Field Order may not result in a change in Unit Prices or contract time. When a Field Order adds or deletes units or adds contingency items, the change in the Contract Price will be covered in a Change Order.

FINAL ESTIMATE - A final statement of Work completed, which is submitted by the Contractor or by the Project Manager. In a unit price contract, the Final Estimate will be issued with a final Change Order - containing a schedule of "over" and "under" runs to the Contract Price.

FUNDING AGENCY - Any agency or governmental body that is contributing funds toward the project. Payments for work funded totally or partially by a funding agency are subject to review by the agency or its representatives in addition to review by the City Engineer and prior to release to the Contractor.

GENERAL - As in "General Terms and Conditions", applying to all City of Rochester contracts unless superceded; compare with: Supplementary.

GUARANTEE BOND - The bond, executed by the Contractor and his Surety, guaranteeing the workmanship and material for a designated number of years after acceptance of the Work by the City.

HIGHWAY - The whole strip of land bounded by the right-of-way lines.

INSPECTOR - See Project Representative.

LABOR AND MATERIAL PAYMENT BOND - The bond executed by the Contractor and its Surety furnished as security for the claims of laborers and material suppliers.

LABORATORY - Any testing laboratory that may be designated or approved by the City Engineer.

LANDSCAPE DEVELOPMENT - Those items necessary for the preservation of landscape materials and features; the rehabilitation and protection against erosion of all areas disturbed by construction through seeding, sodding, mulching and the placing of other ground covers; such suitable planting and other improvements as may increase the effectiveness and enhance the appearance of the Project.

MAYOR, DIRECTOR OF FINANCE, CORPORATION COUNSEL, AND PURCHASING AGENT - The representative officers of the City, or a deputy or substitute for such officer, when exercising the duties of the office.

NOTICE TO PROCEED - A written order to the Contractor, from the City Engineer stating the date on which work is to begin on the Project. The completion date for all Work will be calculated from this start work date.

OR EQUAL - Approved equivalent.

OWNER - The City of Rochester, Monroe County, New York, and wherever appropriate, its authorized agents and representatives.

PARTIAL OR PROGRESS PAYMENTS - Payments to the Contractor for Work satisfactorily performed, made on the basis described in the Contract Documents.

PERFORMANCE BOND - The bond executed by the Contractor and its Surety guaranteeing performance of the Work in accordance with the intent of the Contract Documents.

PRIME CONTRACTOR - Each Contractor with whom the City of Rochester has a direct Contract.

PRODUCT - All materials, systems and equipment provided by the Contractor to be incorporated into the Work.

PROJECT - The construction work to be performed under one or more construction contracts to complete the undertaking.

PROJECT AREA - That area which is directly or indirectly affected by the Project e.g., where it is necessary to close a watermain, all residents affected by this closure will be considered within the Project Area.

PROJECT MANAGER - An authorized representative of the City Engineer, assuming all duties, responsibilities, rights and authority assigned in the Contract Documents. The Project Manager may be a Consultant or an employee of the City, and shall be identified prior to the start of construction by the City Engineer.

PROJECT REPRESENTATIVE - An authorized representative of the Project Manager, assigned to make necessary observations of the Work performed and materials furnished by the Contractor, both on or off the Site of the Project.

PROPOSAL - See Bid.

PUNCH LIST - A list of items of work remaining to be completed or corrected which have been identified in the final inspection. The Punch List will be issued by the City Engineer as a part of the Certificate of Substantial Completion.

REASONABLY CLOSE CONFORMITY - Reasonably close conformity means compliance with reasonable and customary manufacturing and construction tolerances where working tolerances are not specified. Where working tolerances are specified, reasonably close conformity means compliance with such working tolerances. Without detracting from the complete and absolute discretion of the Project Manager to insist upon such tolerances as establishing reasonably close conformity, the Project Manager may accept variations beyond such tolerances as reasonably close conformity where they will not materially affect the value or utility of the Work and the interests of the City.

RIGHT-OF-WAY OR R.O.W. - A general term denoting land, property or interest therein, usually in a strip, acquired for or devoted to a Highway, Street, railroad, etc..

ROADBED - The graded portions of a Highway within top and side slopes, prepared as a foundation of the pavement structure and shoulders.

ROAD SECTION - That portion of a Highway included between the top of the slope in cut and the bottom of the slope in fill.

SHOP DRAWINGS - All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by the Contractor, a Subcontractor, manufacturer, fabricator, supplier or distributor to illustrate some portion of Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a manufacturer, fabricator, supplier or distributor and submitted for some portion of the Work. Structural Shop Drawings must be stamped by an Engineer licensed in New York State.

SHOULDER - The portion of the roadway continous with the traveled way, used for accomodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses.

SITE - The specific area adjacent to and including the area upon which construction work is to be performed. Generally such area may be considered as defined by the right-of-way, or property made available to the Contractor for construction operations.

SPECIFICATIONS - The body of directions, requirements, etc. contained in the Contract Documents together with all pertinent documents of any description and agreements made (or to be made), pertaining to the methods (or manner), place or time of performing the Work or to the quantities and quality as shown by the test records of accepted materials to be furnished under the Contract.

STATE - The State of New York.

STREET - The whole strip of land bounded by the right-of-way lines.

STREET FIXTURES - Manhole frames. receiving basin grates, water valve casings, public utility accessories, traffic control devices (including buried loops), light poles, and permanently fixed street furniture, waste receptacles, planters, and water fountains.

STRUCTURES - Areaways, bridges, culverts, catch basins, drop inlets, retaining walls, cribbing, manholes, end walls, buildings, bus shelters, telephone booths, sewers, service pipes, underdrains, foundation drains and other features which may be encountered in the Work and not otherwise classed herein

SUBCONTRACTOR - Any individual, partnership, corporation or joint venture to whom the Contractor, sublets any part of the Project.

SUBSTANTIAL COMPLETION - The Work (or a specified part thereof) that has progressed to the point where, in the opinion of the City Engineer as evidenced by the definitive Certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it was intended. When the Project consists of a Roadway or utility, Substantial Completion shall not be deemed to occur until the restoration work has been completed, a recommendation of Substantial Completion has been issued by the Project Manager to the City Engineer and the City Engineer has issued a written determination of Substantial Completion.

SUPPLEMENTARY - As in "Supplementary Terms and Conditions", applying to the specific City of Rochester contract in which it appears; compare with: GENERAL.

SURETY - The corporate body which is bound with and for the Contractor for the acceptable performance of the Work and for the payment of all lawful debts incurred in fulfilling the obligations of the Contract Documents.

TON - 2,000 pounds (Short ton).

UTILITY - A publicly, privately or cooperatively owned agency or agencies operated by one or more persons or corporations for public service.

VAULT - See areaway.

WORK - The furnishing of all labor, materials, equipment, and other incidentals necessary or convenient to the successful completion of the Project and the carrying out of all the duties and obligations imposed by the Contract.

WORKING DAYS - Every Calendar Day other than Saturdays, Sundays, and Holidays. "Holidays" shall be construed as those days off, given by the City of Rochester to its general workforce.

1.2 Abbreviations:

Whenever the following abbreviations are used in the Specifications or on the Drawings, they are defined as follows:

AA - The Aluminum Association.

AAMA - Architectural Aluminum Manufacturers Association.

AAMA - 2 - American Architectural Manufactures Association.

AAN - American Association of Nurserymen.

AAR - Association of American Railroads.

AASHTO - American Association of State Highway and Transportation Officials.

ABMA - American Boiler Manufacturers Association.

ACGIH - American Conference of Governmental Industrial Hygienists.

ACI - American Concrete Institute.

ACI-2 - American Carpet Institute.

ACPA - American Concrete Pipe Association.

ACS - American Chemical Society.

ADC - American Diffusion Council.

AFI - Air Filter Institute.

AFPI - American Forest Products Industries, Inc.

AGA - American Gas Association.

AGC - Associated General Contractors of America.

AHDGA - American Hot Dip Galvanizers Association.

AI - The Asphalt Institute.

AIA - American Institute of Architects.

AIA-2 - American Insurance Association.

AIEE - American Institute of Electrical Engineers.

AIHA - American Industrial Hygiene Association.

AIIE - American Institute of Industrial Engineers.

AIPE - American Institute of Plant Engineers.

AISC - American Institute of Steel Construction.

AISI - American Iron and Steel Institute.

AITC - American Institute of Timber Construction.

AMA - Acoustical Materials Association.

AMCA - Air Moving and Conditioning Association.

ANSI - American National Standards Institute, Inc.

APA - American Plywood Association.

API - American Petroleum Institute.

APICS - American Production and Inventory Control Society.

APWA - American Public Works Association.

ARA - American Railways Association.

ARI - Air-Conditioning and Refrigeration Institute.

ASAHC - American Society of Architectural Hardware Consultants.

ASCE - American Society of Civil Engineers.

ASGE - American Society of Gas Engineers.

ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers.

ASID - American Society of Interior Designers.

ASLA - American Society of Landscape Architects.

ASLE - American Society of Lubrication Engineers.

ASM - American Society for Metals.

ASME - American Society of Mechanical Engineers.

ASSE - American Society of Safety Engineers.

ASQC - American Society for Quality Control.

ASTM - American Society for Testing and Materials.

AVATI - Asphalt and Vinyl Asbestos Tile Institute.

AWI - Architectural Woodwork Institute.

AWPA - American Wood Preservers Association.

AWS - American Welding Society.

AWWA - American Water Works Association.

BOCA - Building Officials Conference of America, Inc.

BS - National Bureau of Standards.

CBM - Certified Ballast Manufacturers.

CDA - Copper Development Association, Inc.

CEC - Consulting Engineers Council.

CFR - Code of Federal Regulations.

CIPRA - Cast Iron Pipe Research Association.

CMA - Convector Manufacturers Association.

CPLIA - Contracting Plasterers' and Lathers' International Association.

CRSI - Concrete Reinforcing Steel Institute.

CS - Commercial Standards.

CSI - Construction Specifications Institute.

DFPA - Douglas Fir Plywood Association.

EEI - Edison Electrical Institute.

EJMA - Expansion Joint Manufacturers Association.

EPA - Environmental Protection Agency.

ETL - Electric Testing Laboratories.

FGMA - Flat Glass Marketing Association.

FHWA - Federal Highway Administration.

FIA - Factory Insurance Association.

FM - Factory Mutual Insurance Co.

FMEC - Factory Mutual Engineering Corporation.

FSS - Federal Specifications and Standards.

FTI - Factory Tile Institute.

GA - Gypsum Association.

GDCI - Gypsum Drywall Contractors International.

GRDF - Gypsum Roof Deck Foundation.

HPMA - Hardwood Plywood Manufacturers Association.

HUD - Housing and Urban Development.

IBI - Insulation Board Institute.

IBR - Institute of Boiler and Radiator Manufacturers.

ICBO - International Conference of Building Officials.

IEEE - Institute of Electrical and Electronics Engineers.

IES - Illuminating Engineering Society.

IME - Institute of Municipal Engineers.

ISA - Instrument Society of America.

IPCEA - Insulated Power Cable Engineers Association.

LIA - Lead Industries Association, Inc.

MCAA - Mechanical Contractor Association.

MCA - Manufacturing Chemists' Association.

MFMA - Maple Flooring Manufacturers Association.

MIA - Marble Institute of America.

MLA - Metal Lath Association.

MUTCD - Manual of Uniform Traffic Control Devices.

NAAMM - National Association of Architectural Metal Manufacturers.

NACA - National Acoustical Contractors Association.

NBBPVI - National Board of Boiler and Pressure Vessel Inspectors.

NCMA - National Concrete Masonry Association.

NEC - National Electric Code.

NEMA - National Electrical Manufacturers Association.

NESC - National Electric Safety Code.

NFC - National Fire Codes.

NFPA - National Fire Protection Agency.

NIMA - National Insulation Manufacturers Association.

NLMA - National Lumber Manufacturers Association.

NMWIA - National Mineral Wool Insulation Association.

NCFI - National Oil Fuel Institute.

NOFMA - National Oak Flooring Manufacturers Association.

NRC - National Research Council.

NRMCA - National Ready Mixed Concrete Association.

NSA - National Slag Association.

NSC - National Safety Council.

NSPE - National Society of Professional Engineers.

NTMA - The National Terrazzo and Mosaic Association, Inc.

NYSDOT - New York State Department of Transportation.

NYSSPE - New York State Society of Professional Engineers.

OSA - Optical Society of America.

OSHA - Occupational Safety and Health Act.

PA - The Purchasing Agent of the City of Rochester, New York.

PCA - Portland Cement Association.

PCI - Prestressed Concrete Institute.

PTI - Post Tensioning Institute

RIS - Redwood Inspection Institute.

SAE - Society of Automotive Engineers.

SBI - Steel Boiler Institute.

SDI - Steel Deck Institute.

SJI - Steel Joists Institute.

SMACNA - Sheet Metal and Air-Conditioning Contractors National Association.

SME - Society of Manufacturing Engineers.

SPA - Southern Pine Association.

SPE - Society of Plastics Engineers.

SPIB - Southern Pine Inspection Bureau.

SSA - Seismological Society of America.

SSPC - Steel Structures Painting Council.

TCA - Tile Council of America.

TMA - Tile Manufacturers Association.

TTMA - Tufted Textile Manufacturers Association.

UBC - Uniform Building Code.

UL - Underwriters Laboratories, Inc.

UMTA - Urban Mass Transit Administration.

USASI - (See ANSI).

USC & GS - United States Coast and Geodetic Survey.

USDA - United States Department of Agriculture.

USDOT - United States Department of Transportation.

WRI - Wire Reinforcement Institute.

WWEMA - Water and Wastewear Equipment Manufacturers Association.

WWPA - Western Wood Products Association.

ARTICLE 2. CONTRACT DOCUMENTS: INTENT AND USE

2.1 Intent; Order of Precedence:

2.1.1 The Contractor shall abide by and comply with the true intent of the Specifications and not take advantage of any error or omission, but shall fully complete every part of the Work as the true intent and meaning of the Specifications and Drawings.

2.1.2 Anything shown on the Drawings and not mentioned in the Specifications, or mentioned in the Specifications and not shown on the Drawings shall have the same effect as if shown or mentioned, respectively, in both. Any discrepancy between the Specifications and Drawings shall be submitted to the Project Manager for interpretation, whose decision thereon shall be conclusive. The Specifications may be written in a condensed style in lieu of full-sentence style. A Product listed therein shall be interpreted as "Contractor (or Subcontractor) shall furnish" said Product. A procedure described shall be interpreted as "The Contractor shall execute" said procedure.

Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the code of any governmental authority shall mean the latest standard specification, manual or code in effect at the time of opening of Bids except as may be otherwise specifically stated. Such standard specifications, manuals or codes shall be construed to be the minimum requirements of the Contract Documents.

2.1.3 The components of the Contract Documents shall govern in the following order of precedence:

1st) Addenda (if any)
2nd) Supplementary Laws and Regulations
3rd) General Laws and Regulations
4th) Supplementary Instructions to Bidders
5th) Supplementary Terms and Conditions
6th) Supplementary Specifications
7th) City of Rochester Standard Specifications
8th) NYSDOT Standard Specifications
9th) Drawings
10th) General Instructions to Bidders
11th) General Terms and Conditions
12th) Other Documents

2.1.4 The Contractor shall examine and check all Drawings and Specifications as furnished by the City, for dimensions, quantities and coordination with other parts of the Work on this or related Projects; and shall notify the Project Manager in writing, of any and all errors, omissions, or discrepancies the Contractor may discover by examining and checking same. The Contractor shall not be allowed to take advantage of any such error, omission, or discrepancy, as full instructions will be furnished by the Project Manager, and the Contractor shall carry out such instructions as though originally specified.

In no case shall the Contractor proceed with the Work in uncertainty. Any Work done by the Contractor after the discovery of any error, omission, or discrepancy, until authorized, will be at the Contractor's risk and responsibility. The Work is to be made complete and to the satisfaction of the Project Manager notwithstanding any omission in the Specifications or on the Drawings.

2.2 Use:

2.2.1 Neither the Contractor nor any Subcontractor, manufacturer, fabricator, supplier or distributor shall have or acquire any title to or ownership rights in any of the Contract Documents which include the Drawings and

Specifications (or copies of any thereof) prepared by or bearing the seal of the City of Rochester, the City Engineer or their representatives; and they shall not reuse any of them on extensions of the Project or any other project without written consent of the City, the City Engineer and their representative, and specific written verification or adaptation by the City Engineer or his representative.

2.3 Copies of Documents:

2.3.1 Prior to commencement of the Work, the City will furnish six (6) complete sets of Contract Proposal Books, and Drawings to the Contractor without cost. Additional copies will be furnished on request, subject to availability, at a cost sufficient to reproduce and assemble the documents.

ARTICLE 3. PROJECT START-UP

3.1 Delivery of Bonds:

3.1.1 When the Contractor delivers the Executed Contract Document to the City, the Contractor shall also deliver to the City such bonds as the Contractor may be required to furnish in accordance with Section 4.1.2.

3.2 Commencement of Contract Time:

3.2.1 The Contractor shall start work within ten days of the receipt of the written Notice to Proceed issued by the City Engineer. No work shall be performed until the Notice to Proceed is issued. The contract time shall commence at the start date specified on the written Notice to Proceed, regardless of when the contractor actually starts work.

3.2.2 In the event of the Contractor's failure to substantially complete (see Article 14) the Work in accordance with the completion time requirements specified in the Special Instructions to Bidders, he shall be liable to pay to the City liquidated damages in accordance with the "Schedule of Deductions for Each Day of Overrun in Contract Time" included in Section 10.3.

3.3 Before Starting Construction:

3.3.1 The Contractor shall submit a progress schedule to the Project Manager before commencement of the Work. Date and time of commencement, progress, and completion of the Work shall be in accordance with the approved progress schedule, except for approved variations authorized in accordance with these Contract Documents. In addition, the Contractor shall coordinate with other concurrent City projects and projects undertaken by others in or near the project, wherever such coordination may be reasonably incorporated into the schedule. Where the Project Site is an operational facility, its operations shall not be impaired except as specified or authorized by the Project Manager and stipulated in the approved schedule.

3.3.2 The Contractor shall also submit to the Project Manager a schedule of Shop Drawing submissions and a schedule of values of the Work. The schedule of values of the Work shall be submitted for lump sum Agreements and lump sum items in unit price Agreements. The schedule of values must be approved by the Project Manager before the Work commences.

3.4 Preconstruction Meetings:

3.4.1 The Project Manager will schedule a preconstruction conference with the Contractor and approved subcontractors, at which meeting the Project Manager and Contractor, utilities, and other agencies will discuss detailed procedures of correspondence, coordination and scheduling of the Work. Traffic maintenance, security, and similar subjects will be discussed or established.

3.5 Public Meetings:

3.5.1 The Project Manager will schedule public meeting(s) during normal work hours or evenings if necessary. A Project Manager approved contractor representative will be required to attend any scheduled public meetings prior to/or during the Work if requested by the Project Manager.

ARTICLE 4 BONDS AND INSURANCE

4.1 Bonds

4.1.1 Bid Bonds:

A Bid Bond in an amount equal to five (5) percent of the bid price shall be furnished with each bid. At its option, the City shall have the right to accept cash, certified checks, irrevocable letters of credit for the same amount.

4.1.2 Performance and Payment Bonds:

A. The Contractor must furnish two executed Surety company bonds, each in an amount equal to one hundred (100) percent of the Bid price.

1) A Performance Bond shall be furnished as security for the faithful performance by the Contractor of all the terms and conditions of the Contract Documents.

2) A Labor and Material Payment Bond shall be furnished as security for the claims of laborers and material suppliers.

3) Both bonds shall be made out to the City of Rochester, prepared on an approved form and submitted by the Contractor to the Purchasing Agent within ten (10) days of notification that its Bid was awarded. The Surety thereon must be such Surety company or companies as are authorized and licensed to transact business in the State of New York. The Surety furnishing the Performance Bond and the Labor and Material Payment Bond must waive notice of any change in the contract price or contract time. Attorneys-in-fact who sign bonds must file with each bond a certified copy of their power of attorney to sign said bonds.

B. Alternate Security:

1) At its option, the City shall have the right to accept cash, certified checks, irrevocable letters of credit.

2) In the event the Contractor submits cash or a cash instrument as alternate security, the City will accept one hundred (100) percent of the contract total as satisfying both Performance and Payment security requirements.

3) Any security accepted in lieu of a payment bond shall be retained until the City is no longer liable for mechanic's liens against the work of the contract.

4.1.3 Guarantee Bond:

Prior to the acceptance of the Work, and, when required by the City, prior to the acceptance of any work corrected under the terms of a guarantee bond the Contractor shall furnish to the City a Guarantee Bond. This bond shall be in a form prescribed by the City or acceptable to the City, and shall be designed to assure the City that improper or defective materials and faulty workmanship shall be corrected by the Contractor at no expense to the City during the two (2) year warranty period. The bond shall have a Surety thereon such Surety company or companies as are acceptable and approved by the City and as are authorized to transact business in New York State, and shall be in an amount of twenty-five (25) percent of the final Contract Price. In the event the work is corrected under the terms of the guarantee bond, an additional bond in the amount of twenty-five (25) percent of the value of the corrected work shall be submitted and the warrantied work shall be guaranteed for two years from acceptance of corrected work. In no case will the value of the bond be less than $1,000.

4.2 Insurance:

4.2.1 The Contractor shall procure and maintain at its own expenses until final acceptance of the work covered by the contract documents, insurance for liability for damages imposed by law of the kinds and in the amounts hereinafter provided from insurance companies licensed to do such business in the State of New York covering all operations under the Contract Documents whether performed by the Contractor or its Subcontractors. If the Contractor is comprised of more than one legal entity (excluding subcontractors) each such entity will be jointly named.

Within ten (10) days of Award of Contract, the Contractor shall furnish to the City Finance Director a certificate or certificates of insurance in form satisfactory to the City Purchasing Agent showing compliance with this Section. The certificate or certificates shall provide that the policies shall not be materially changed or cancelled until ten days written notice has been given to the City Finance Director. In each policy of insurance except insurance of Workers' Compensation and Disability Insurance, the City and other appropriate Funding Agencies shall be named as an additional insured for liability arising under this Contract. Except for Workers' Compensation and Disability Insurance, no insurance requried herein shall contain any exclusion of municipal operations performed in connection with the project. The kinds and amounts of insurance are as follows:

A. **WORKERS' COMPENSATION AND DISABILITY INSURANCE.** The Contract shall be void and of no effect unless the person or corporation making or executing same shall secure Compensation and Disability coverage, covering all operations under the contract-whether performed by the Contractor or its Subcontractors – for the benefit of, and keep insured during the life of said Contract, employees in compliance with the provisions of the Workers' Compensation Law.

1) **Workers' Compensation Insurance.** A policy covering the operations of the Contractor in accordance with the provisions of Chapter 41 of the Laws of 1914, as amended, known as the Workers' Compensation Law.

2) **Disability Insurance**. A policy covering the operations of the Contractor in accordance with the provisions of Article 9 of the Workers' Compensation Law, known as the Disability Benefits Law (Chapter 600 of the Laws of 1949) and amendments thereto.

B. **PROPERTY AND CASUALTY INSURANCE.** The policy limits, unless otherwise indicated in the Supplementary Terms and Conditions shall be:

1) **Contractor's Comprehensive General Liability Insurance.** Issued to the Contractor and covering the liability for damages imposed by law upon the Contractor with respect to all work performed by the Contractor under the within Contract. The Contractor's Comprehensive General Liability Insurance shall include: Independent contractor's insurance, premises operation insurance, completed operations insurance and broad form property damage insurance. The x., c., u. exclusion shall be eliminated from the Contractor's Comprehensive General Liability Insurance. The comprehensive general liability policy shall furnish limits of not less than:

BODILY INJURY AND PROPERTY DAMAGE LIABILITY
Combined Single Limit
$1,000,000

for all damages arising during the policy period.

2) **Motor Vehicle Insurance.** Issued to the Contractor and covering public liability and property damage on the Contractor's vehicles in the amount of:

BODILY INJURY AND PROPERTY DAMAGE LIABILITY
Combined Single Limit
$1,000,000

C. **BUILDER'S RISK INSURANCE.** Unless otherwise specified in the Contract Documents, the Contractor shall effect and maintain insurance against loss on an "All Risk" basis upon all work in place and all materials and equipment in connection therewith, whether or not furnished or delivered by any person or contractor other than the contractor or by the City, itself, and whether or not covered by partial payment made by the City. This insurance shall be in an amount equal to the full insurable value thereof at all times and shall be for the benefit of the City, the contractor and each subcontractor as their interest may respectively appear. This insurance shall be obtained on the "completed value" form. The City and other appropriate Funding Agencies shall be named as an additional named insured in this policy.

4.3 Contractural Liability Insurance:

4.3.1 The comprehensive general liability insurance required by paragraph 4.2.1.b(1) shall include contractual liability insurance applicable to the Contractor's obligations under Section 6.15.

4.4 Waiver of Rights:

4.4.1 The City and the Contractor waive all rights against each other and the Subcontractors and their agents and Employees and against the Consultant and separate contractors (if any) and their subcontractors' agents and employees for damages caused by fire or other perils to the extent covered by insurance provided under paragraph 4.2.1.C., inclusive, or any other property insurance applicable to the Work, except such rights as they may have to the proceeds of such insurance held by the City as trustee. The City shall require similar written waivers by the Consultant and from each separate contractor, and the Contractor shall require similar written waivers from each Subcontractor; each such waiver will be in favor of all other parties enumerated in this Section.

4.5 Receipt and Application of Proceeds:

4.5.1 Any insured loss under the policies of insurance required by paragraph 4.2.1.c. shall be adjusted with the City and made payable to the City as trustee for the insureds, as their interests may appear, subject to the following paragraph. The City shall deposit in a common account with its other funds, money so received, and shall distribute it in accordance with such agreement as the parties in interest may reach. Earnings from such deposited funds will be credited pro rata to all the fund beneficiaries. Any earnings in excess of 6% per annum simple interest shall accrue to the City as a trustee's fee. If no agreement is reached within 30 days following payment of insurance proceeds to the City, the damaged work shall be repaired or replaced, the moneys so received and applied on account thereof and the work and the cost thereof covered by an appropriate Change Order.

4.5.2 The City as trustee shall have the absolute power, in its sole discretion, to adjust and settle any loss with the insurers.

4.6 Partial Utilization - Property Insurance:

4.6.1 If the City finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, such use or occupancy may be accomplished provided that no such use or occupancy shall commence before the insurers providing the property insurance have acknowledged notice thereof and in writing affected the changes in coverage necessitated hereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be cancelled or lapse on account of any such partial use or occupancy.

ARTICLE 5. AVAILABILITY OF LANDS; PHYSICAL CONDITIONS; REFERENCE POINTS

5.1 Availability of Lands:

5.1.1 The City shall furnish, as indicated in the Contract Proposal Book, the lands upon which work is to be performed, rights-of-way for access thereto, and such other lands which are designated for the use of the Contractor. Easements, Agreements, Licenses, or Leases for permanent structures or permanent changes in existing facilities, including areaways, will be obtained and paid for by the City, unless otherwise provided in the Contract Documents. If the Contractor believes that any delay in the City's furnishing these lands or easements entitles the Contractor to an extension of the contract time, the Contractor may make a request therefor as provided in Section 10.3 "Changes in the Contract Time".

5.1.2 The Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment. Easements, Permits, Agreements, Licenses, or Leases of these lands shall be obtained and paid for by the Contractor. The Contractor's use of these lands is subject to all local, State, or Federal laws, ordinances, rules, or regulations controlling or limiting in any way their use of these lands.

5.2 Physical Conditions - Investigations and Reports:

5.2.1 The Contractor shall refer to the Supplementary Terms and Conditions for copies of those reports of investigations and tests of subsurface and latent physical conditions at the Site or otherwise affecting cost, progress or performance of the Work which have been relied upon by the Design Professional in preparation of the Contract Proposal Book or Drawings. Such reports are not guaranteed as to accuracy or completeness. The Contractor shall not be entitled to an increase in the Contract Price or an extension of contract time because of inaccuracy or incompleteness of reports on or tests of subsurface and latent physical conditions unless a change in design is made. A request for an increase in Contract Price due to design changes shall be considered according to the requirements of ARTICLE 10.

5.3 Unforeseen Physical Conditions:

5.3.1 In addition to showing the structures to be built under these Contract Documents, the Drawings show certain information obtained by the City regarding the conduits, pipe lines, existing pavements, concrete slabs and rock, and other structures which exist at the Site of the Work, both at and below the surface of the ground. The City expressly disclaims any responsibility for the accuracy or completeness of the information given on the Drawings with regard to existing structures, conduits, pipe lines, existing pavements, concrete slabs and rock, and the Contractor will not be entitled to an increase in the contract price or an extension of contract time on account of inaccuracy or incompleteness of such information. Said structures, conduits, pipe lines, existing pavements, concrete slabs and rock, are being shown only for the convenience of the Contractor who must verify the information to its own satisfaction. The Contractor shall support and protect all conduits, pipe lines, pavement, concrete slabs and other structures which may be encountered during the construction of the Work, and make good all damages done to such conduits, pipe lines, pavement, concrete slabs and structures.

5.4 Reference Points:

5.4.1 All reference points, base lines, stakes and bench marks necessary to complete the Project shall be verified and established by the Contractor.

5.5 Contract Limit Lines:

5.5.1 The Contract or project limit lines are shown on the Drawings. The Contractor shall not perform any work outside these limits unless directed in writing by the City Engineer. Should the Contractor perform any work outside these limits, without written authorization it does so at its own risk and shall restore any property so disturbed to its original condition.

5.6 Utilities:

5.6.1 Within the limits of and adjacent to the project there are known to exist public and private utilities in the form of sanitary sewers, storm drains, traffic and street light systems, parking meters, gas lines, steam lines, water lines, fire hydrants, aerial and underground power, fire alarm, police, telegraph and telephone lines. The Contract Drawings show some known public and private utilities in their approximate locations within the limits of the project which may interfere with the work. The Contractor is, however, cautioned that these locations are not guaranteed, nor is there any guarantee that all utility lines in existence within the limits of the project have been shown. Utilities shown or encountered in work shall be maintained and protected in their locations unless otherwise shown or specified. The Contractor shall familiarize itelf with the existence of municipal and other public service installations on the Site of the Work and see that reasonable opportunity and cooperation are extended to the owners of such utilities in their Work of protecting, reconstructing or altering them.

5.6.2 The Contractor shall not disturb any part or parts of such facilities without the approval of their owner and the Project Manager. The Contractor shall establish and maintain direct and continuous contact with the owners or operators of the respective utilities and shall cooperate with them at all times and in all places of the work. Before commencing construction, the Contractor shall verify the locations of utilities which may be affected by its operations. Failure of a utility owner to cooperate in the removal or alteration of such facilities shall be immediately reported in writing by the Contractor to the Project Manager. No such failure by a utility owner shall form a basis for any claim under the Contract Documents or for damages for breach of contract, but any delay to the Contractor resulting therefrom may be deemed compensated by an extension of time for the completion of the Project.

5.6.3 The Contractor shall notify the Project Manager and appropriate utility immediately upon damage done to a utility by the Contractor and make formal notification within 24 hours of the occurrence of the damage. Damaged utilities will generally be repaired by the utility owner at the Contractor's expense.

5.6.4 The Contractor is to notify all operators of underground facilities whether or not listed in the City of Rochester Central Registry of its intent to perform construction, excavation or demolition work in a specified area. The Contractor shall notify the Project Manager, utility companies and the jurisdictional agencies at least 48 hours in advance of construction which may interfere with the operation of such utilities. All applicable requirements under the State of New York Industrial Code Rule 53, "Construction, Excavation and Demolition Operations At or Near Underground Facilities", shall be met by the Contractor during this Project.

5.6.5 Private utility companies shall be responsible for adjustment of all their existing or new facilities to finish elevations.

ARTICLE 6. CONTRACTOR'S RESPONSIBILITIES

6.1 Supervision and Superintendence:

6.1.1 The Work and the work site shall be under the direct charge and direction of the Contractor. The Contractor shall give sufficient superintendence to the Work, using the best skill and attention. The Contractor shall be responsible for supervising its own employees and any subcontractors. The Contractor shall at all times keep on the site, during its progress, a competent, English speaking Superintendent, acceptable to the Project Manager and any and all necessary Forepersons and Assistants, all satisfactory to the Project Manager. The Superintendent shall represent and have full authority to act for the Contractor in the latter's absence, and the directions given to the Superintendent shall be as binding as though given to the Contractor. The same shall apply to the Forepersons during the absence of both the Contractor and the Superintendent. The Superintendent shall not be changed during the performance of the Work covered by the Contract Documents except with written consent of the Project Manager unless the Superintendent proves to be unsatisfactory to the Contractor and ceases to be in its employ.

6.1.2 Should the Project Manager at any time give notice in writing to the Contractor or its representative on the Work that any employee is insolent, disorderly, careless, unobservant of the instructions, dishonest, or in any way a detriment to the satisfactory progress of the Work, such employee shall at once be removed from the Project and not again be allowed to engage in any part of the Work.

6.1.3 The Contractor shall be required to organize, manage and supervise its own work and to coordinate the work of its subcontractors. On all multi-contract projects, all prime contractors shall be required to organize, manage and supervise their own work. On all multi-contract projects, all prime contractors shall cooperate with the City and other prime contractors in the overall coordination and supervision of the project.

6.1.4 The Contractor shall submit a schedule of the work necessary to complete the project to the Project Manager for review at the time of the preconstruction meeting. The schedule shall be in a form approved by the Project Manager indicating the estimated start and end dates of each major item or phase of the work.

6.2 Labor, Products, and Storage:

6.2.1 The Contractor shall provide competent, suitably qualified personnel to lay out the Work and perform construction as required by the Contract Documents. The Contractor shall at all times maintain good discipline and order at the Site.

6.2.2 Following execution of the Contract, the Project Manager shall request the Contractor to furnish in writing to the Project Manager the sources of supply and types of all Products which it proposes to use in the Work. The Contractor shall have three working days to comply with this request. No Products may be delivered to the Site until they have been reviewed by the Project Manager. No change shall be made in the sources of supply or kinds of Products or in the type of any item except upon written approval by the Project Manager. Normally, only one source of supply for any Product will be approved.

6.2.3 The Contractor shall be responsible to see that all Products used in the Work shall meet the quality requirements described in the Contract Documents and that the finished Work complies accurately with the Contract Documents.

6.2.4 The Products to be incorporated in the Work shall be new, and all chemical and physical properties shall be in accordance with the Specifications as referred to in the Contract Documents. Except that the specifications will not exclude the use of products manufactured from secondary materials or require that products be manufactured from virgin materials, unless the City Engineer determines that, for a particular end use, a product containing secondary materials would not meet necessary performance standards.

6.2.5 The Contractor shall be responsible for the Products covered by this Contract until they are delivered to the designated point and received, properly installed if necessary, and either accepted in writing by the City, or until Substantial Completion. The Contractor shall bear all risk on rejected products or unaccepted products until Substantial Completion. Rejected or damaged products must be removed by and at the expense of the Contractor promptly after notification of rejection, unless public health and safety require immediate destruction or other disposal of the rejected products. Upon failure to do so within ten (10) days after date of notification, the City may return the rejected products to the Contractor at its risk and expense, or dispose of them as its own property.

6.2.6 The Contractor shall store: all materials on approved locations secure against being a public hazard or nuisance, subject to misuse, theft or damage; all package materials in original containers, clearly identified as to product, manufacturer, brand name, destination and project number; and all materials under conditions specified or recommended by the manufacturer. Unless otherwise authorized, storage conditions shall exclude the entry of water. Products containing water shall be protected against freezing.

6.2.7 The Contractor shall not be liable for liquidated damages due to delay in shipment or failure to deliver when such delay or failure is the result of fire, flood, strike, act of God, act of government, act of an alien enemy or by any other circumstances which, in the City Engineer's opinion is beyond the control of the Contractor. The Contractor must notify the City Engineer of any such delay within 10 calendar days of its occurrence. Under such circumstances, however, the City Engineer may with discretion, terminate the Contract.

6.2.8 The Contractor, without charge shall make such slight alterations as may be necessary to make adjustable parts fit to fixed parts or portions of the Project, leaving all complete and in proper shape when done.

6.3 Equivalent Products:

6.3.1 After execution of the Contract, substitution of makes or brands or modes of construction other than those specifically named or provided for in the Contract Documents may be approved by the Project Manager if the Product proposed for substitution is equivalent to or superior to the Product named.

6.3.2 To receive consideration, requests for substitutions as aforesaid must be accompanied by documentary proof of equivalency. The decision as to such requests shall be at the complete discretion of the Project Manager.

6.3.3 If no particular brand, model, or make is specified, and if no data are required to be submitted with the Bid, the successful Contractor after award and before manufacture or shipment, may be required to submit Shop Drawings or detailed descriptive data sufficient to enable the Project Manager to judge if each requirement of the Specifications is being complied with.

6.3.4 The Project Manager hereby reserves the right to approve as an equal, or to reject as not being an equal, any article the Contractor proposes to furnish which contains major or minor variations from Specification requirements but complies substantially therewith. In this case, the Project Manager at his/her discretion may request certified quotations from suppliers of both specified and proposed equipment and materials. In the case of a difference in cost involved in any nonequivalent substitution, the Contract Documents shall be altered by a Change Order to authorize either an increase or decrease to the Contract Price.

6.3.5 Any costs due to extra or additional work, including engineering redesign, which result from a contractor-requested substitution shall be the responsibility of the Contractor who made the request. On multi-prime contracts, any extra or additional work for contractors other than the contractor requesting the substitution shall be the responsibility of the requesting contractor. In no case shall the City be responsible for extra/additional costs due to Contractor-requested substitutions.

6.4 Concerning Subcontractors and Suppliers:

6.4.1 If the Supplementary Terms and Conditons do not require approval of all Subcontractors and Suppliers prior to the award of the Contract, the Contractor shall submit to the Project Manager a list of suppliers for all items of work and a list of all items or sections of the Work to be subcontracted, and the identity of the proposed Subcontractors after execution of the contract.

6.4.2 The proposed Subcontractors and Suppliers or changes to the approved Subcontractors and Suppliers must be approved in writing by the Project Manager and by the City's Finance Director. A proposed Subcontractor or Supplier may be disqualified for any of the following reasons:

A. Lack of responsibility as shown by past work, judged from the stand point of workmanship or progress.

B. Uncompleted work under other contracts, which in the judgement of the City, might hinder or prevent the prompt completion of the Project.

C. Being in arrears on existing contracts, in litigation with the City, or having defaulted on a contract awarded to it by the City or other public agency.

6.4.3 A rejected Subcontractor or Supplier may request a hearing from the City Engineer within five (5) calendar days of its disqualification.

6.4.4 The Contractor shall be fully responsible for all acts and omissions of his Subcontractors and Suppliers, or persons and organizations directly or indirectly employed by them, and of persons and organizations for whose acts any of them may be liable, to the same extent that the Contractor is responsible for the acts and omissions of persons directly employed by the Contractor. Nothing in the Contract Documents shall create any contractual relationship between the City or the Project Manager and any Subcontractor, Supplier or other person or organization having direct contract with the Contractor.

6.5 Patents, Copyrights, Patent Fees and Royalties:

6.5.1 The Contractor agrees that, in the event it, or any of its employees, develops any material for which a copyright can be obtained which material was developed as a result of or in connection with the Work required pursuant to this Contract, the City shall be granted a royalty-free, non-exclusive license to use, reproduce and distribute such copyrightable material. The Contractor further agrees that in the event it, or any of its employees, develops any process, machinery or product for which a patent would be obtainable, the Contractor shall provide the necessary information to the City, so that the City can apply for such patent at its own expense. Such patent shall become the property of the City; provided, however, that the Contractor shall acquire a royalty-free, non-exclusive license to produce or reproduce such patented product. The benefits of either a patent or a copyright shall also inure to any public agency which finances, in whole or in part, the Project and such Agency shall receive a royalty-free, non-exclusive license to use, reproduce, manufacture and distribute the product or material which has been patented or copyrighted.

6.5.2 As part of the Contractor's obligation hereunder and without any additional compensation the Contractor will pay for all patent fees or royalties required in respect to the Work or any part thereof and will fully indemnify the City and the Design Professional for any loss on account of infringement of any patent rights unless, prior to his use in the Work of a particular process or product of a particular manufacturer, the Contractor notifies the City, in writing, that such process or product is an infringement of a patent.

6.5.3 The Contractor further shall guarantee the City and the Design Professional against any expenses or interruption of work arising from patent litigation, brought about by the use of patented material or equipment for which license or patent rights have not been secured by the Contractor or its source of supply.

6.6 Permits:

6.6.1 The Contractor shall secure at its own expense, all necessary permits and licenses, and shall give all notices necessary to the due and lawful prosecution of the Work. The Contractor shall also be responsible for all costs for any permits which must be obtained in the name of the City. The Contractor shall submit copies of all permits and licenses to the Project Manager.

6.7 Laws and Regulations:

6.7.1 The Contractor agrees that, during the performance of the Work required pursuant to this Contract, the Contractor, and all employees working under his direction, shall strictly comply with all local, state or federal laws, ordinances, rules or regulations controlling or limiting in any way their actions during their said performance of the Work required by this Contract. Furthermore, each and every provision of law, and contractual clause required by law to be inserted in this Contract shall be deemed to be inserted herein. If, through mistake or otherwise, any such provision is not inserted or is not correctly inserted, then upon the application of either party this Contract shall be forthwith physically amended to make such insertion or correction.

6.8 Taxes:

6.8.1 The City of Rochester is exempt from State and Federal Taxes. It shall be the Contractor's responsibility to assure that no such taxes are included in any Bid or are charged to the City in any manner.

6.8.2 The Contractor's attention is directed to the City's tax exempt status regarding State and local retail sales taxes and compensating use taxes. The City of Rochester's tax exempt number is EX A 159151.

6.8.3 All taxes which are applicable to the Work and Products supplied under this Contract shall be paid by the Contractor, it being understood that in no case shall any such tax be borne by the City.

6.8.4 If any City, County, State or Federal excise tax or personal property tax which, at the date of the opening of bids, is applicable to any of the equipment, materials, supplies or services to be furnished, used or supplied by the Contractor, shall thereafter be repealed, reduced, or rendered inapplicable by reason of repeal, amendment, unconstitutionality, invalidity or judicial construction of any law or for any reason whatsoever, then there may be deducted by the City from the sum otherwise due to Contractor an amount or amounts equal to such tax not paid or such costs which have been eliminated, and if not so deducted, it may be otherwise recovered by the City.

6.9 Use of Site:

6.9.1 The Contractor shall:

A. Take every precaution against injuries to persons or damage to property and be the responsible party for any injuries on the Site or any areas made available to the contractor, caused by negligent maintenance, inspection, operation, or other negligence with respect to the operation of the Site.

B. Store its products, tools, and equipment at the Site or any areas made available to the contractor in such manner that there will be no undue nuisance or hazard to the public, or interference with the progress of its work or that of other contractors. Storage, stockpiling or placement of any equipment, materials or supplies within the area of any public street or alley, including the sidewalks thereof, will be allowed only if such storage, stockpiling or placement does not in any way obstruct any lane or passageway intended for vehicular or pedestrian traffic or impede or prevent work efforts by other public or private contractors by their presence. The Contractor shall obtain prior approval in writing from the Project Manager for the use of said area for the storage of any equipment, materials or supplies.

C. Not overload any part of the Work.

D. Keep the Site clean of all refuse, rubbish, scrap materials, and debris caused by its operation.

E. Clean up all work upon completion according to the direction of the Project Manager and leave the Site in a neat and orderly condition.

F. Cut, fit, or patch its work to make it conform to the Contract Documents and not cut or otherwise alter the work of any other contractor.

G. Take adequate measures to minimize erosion of soils and to prevent silting and muddying of streams, rivers, drainage structures irrigation systems, impoundments (lakes, reservoirs, etc.) and lands adjacent to or affected by the Work.

H. Take adequate steps to protect all existing trees within and adjacent to the Work Site. Tree trunks shall be protected against damage as directed by the Project Manager. Storage of materials or equipment within 6 feet of any tree will not be permitted.

I. Comply with City Noise Ordinances during the Work.

J. Not pump or discharge any sewage on to any surface at the Project Area. Any areas subject to sewage spills will be treated by the Contractor as ordered by the Project Manager.

6.10 Record Documents and Audits:

6.10.1 The Contractor shall keep one record copy of all Contract Documents, Addenda, Field Orders, Change Orders, Shop Drawings and samples at the Site, in good order and annotated to show all changes made during the construction process. These shall be available to the Project Manager for examination and shall be delivered to the Project Manager for the City upon completion of the Work.

6.10.2 The Contractor agrees to maintain sufficient on-site records and information necessary for the documentation of any and all facets of Project operation specified by these Contract Documents. The Contractor agrees to permit on-site inspection and auditing of all records, books, papers and documents associated with this Contract by authorized representatives of the City or other public agencies having jurisdiction over the Project, and further agrees to provide necessary staff support to the performance of such audit. The Contractor agrees to maintain for a period of three (3) consecutive years after termination or completion of this Contract any and all records, reports and other documentation arising from the performance of this Contract; however this period shall be extended beyond three years for any and all records and information pertaining to unresolved questions, which have been brought to the Contractor's attention by written notice by the City. The Contractor agrees to furnish copies of such records to the City of Rochester's Central Records Unit when requested by the City.

6.11 Safety and Protection; Maintenance and Protection of Traffic:

6.11.1 The Contractor shall be fully and solely responsible for the protection from loss, theft or damage of all of its and the City's products, equipment, tools, or other facilities at the Work Site. The Contractor shall take every precaution to prevent damage or deterioration of the Work performed and shall store all products in such manner that they will not become an obstruction or become damaged in any way.

6.11.2 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. The Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss of:

A. All Employees on the Site,

B. All the work and all products to be incorporated therein, whether installed or in storage on or off the Site,

C. Other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction,

D. Any other persons or property affected by the work.

6.11.3 The Contractor shall be responsible for ensuring observance of OSHA provisions and the State of New York Labor Law, including but not limited to Section 240, pertaining to the safe performance of the work. Further, the Contractor shall ensure that the methods of performing the work do not involve undue danger to the personnel employed thereon, the public, and public and private property. Should charges of violation of any of the above be issued to the Contractor in the course of the work a copy of each charge shall immediately be forwarded to the Project Manager.

6.11.4 Contractor shall assume all responsibility for, indemnify, and hold harmless the City against all damage to persons or property which may occur during the execution of the Work and shall replace or make good any such damage, loss or injury.

6.11.5 The legal closing of a Street to public travel will be done only upon authorization of the City Engineer. Whether a Street is closed or not, the Contractor shall at all times of the day and night provide a safe driveway and walkway for the use of traffic, emergency vehicles, vehicles for handicapped citizens, and pedestrians to and from properties along the street. Such passageways shall be adequately maintained and provided with proper signs, barricades, lights and/or flagging personnel. When a Street is not legally closed to public travel the Contractor shall maintain traffic at all times, and shall provide adequate warning and protection to such traffic.

6.11.6 The Contractor shall be responsible for notifying in writing each principal occupant of a house, office building, etc. within the Project Area in advance of the start of work or change of work stage, of the affect of such work on the access to their property or other major impacts on them. Notifications of water system shut-offs must be made 24 hours in advance to all affected occupants of a house, office building, etc. All notifications shall be in written form approved by the Project Manager and distributed to all affected parties by the Contractor. No work will be allowed to begin until after distribution of notices.

6.11.7 When a Street is legally closed and public travel diverted therefrom, adequate warning, danger and direction signs and lights shall be erected and maintained by the Contractor to properly protect and direct public travel by day and night. The Contractor shall also ensure that emergency vehicle access is provided to all properties on a street.

Suitable barricades and large signs indicating closure shall also be erected at the ends of such closed streets. The Contractor shall assume all responsibility for injury to persons or damage to property that may accrue during the prosecution of the Work, due to its negligence or that of its employees in failing to take the necessary precautions for the protection of traffic and persons.

6.11.8 The Contractor shall at all times during the progress of the Work interfere as little as possible with the convenience of the public. The safety and convenience of the general public and the residences along or near the Project shall be provided for by the Contractor. The Contractor shall schedule the work so that sidewalks with a smooth hard surface on one side of a street are always available to the public.

6.11.9 The Contractor shall comply with City of Rochester Noise Ordinances during any Work on or off the Site.

6.11.10 The Project Manager shall be informed in writing of the proposed haul routes prior to the Contractor's routing of construction equipment and vehicles carrying spoil, concrete or other materials. Routes must be over streets that will cause the least disturbance to residents in the vicinity of the work. Trucks leaving the site and entering paved public streets shall be cleaned of mud and dirt clinging to the body and wheels of the vehicle.

Trucks arriving and leaving the site with materials shall be loaded so as to prevent dropping materials and debris on the streets. The Contractor will be responsible for the cleaning of all streets affected by the work within and outside the Project Area.

6.11.11 Demolition shall be performed in compliance with the requirements of the United States Environmental Protection Agency, National Emission Standards for Hazardous Air Pollutants, Section 112 of the Clean Air Act as amended 42 U.S.C. 1957 et seq. (The Act). This Act covers air pollution from asbestos, beryllium, and mercury and requires prior notification to the Agency of intent to demolish a structure having these materials and certain precautionary measures during demolition.

6.11.12 The Contractor shall provide and maintain access to all buildings at the site for vehicles. This shall include, but not be limited to school buses, public service vehicles, emergency vehicles, and vehicles for the transport of handicapped citizens.

The Contractor shall at all times during the progress of the work interfere as little as possible with the operations of the Regional Transit System (RTS) bus routes and operations. The safety and convenience of RTS bus patrons along or near the Project shall be provided for by the Contractor. The Contractor shall coordinate any temporary bus stop locations or vehicle movement restrictions with the Rochester Genesee Regional Transportation Authority (RGRTA). A smooth hard surface bus patron waiting area shall be provided and maintained by the Contractor at all bus stops.

6.11.13 The Contractor shall be responsible for ensuring that applicable NYSDOT Rules, Regulations, or guidelines are compled with when initiating changes to traffic patterns, flows, interuptions or diversions.

6.12 Emergencies:

6.12.1 In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, the Contractor, without special instruction or authorization from the Project Manager or the City Engineer, is obligated to act to prevent threatened damage, injury or loss. The Contractor shall give prompt written notice to the Project Manager of any significant changes in the Work or deviations from the Contract Documents caused thereby.

6.12.2 Any claims for compensation by the Contractor due to such Extra Work shall be submitted to the Project Manager for the City Engineer's approval. Where the Contractor has not taken action but has notified the Project Manager of an emergency threatening injury to persons or damage to the Work, the Sites or any adjoining property, the Contractor shall act as instructed and authorized by the Project Manager to prevent such threatened injury or damage. The amount of such reimbursement claimed by the Contractor on account of any such action shall be determined in the manner provided in Section 10.2 of the General Terms and Conditions entitled "Changes in the Contract Price".

6.12.3 It is mutually understood by the City and by the Contractor:

A. That performance of the Project is based on the assumption that all necessary products, equipment and personnel can be made available to complete the Work in the time required in the Contract;

B. That the City may order the Work suspended if emergency conditions, such as war or natural disaster, make the necessary products, equipment or personnel unavailable;

C. That if the Work is suspended due to emergency conditions, the Contractor shall receive payment for products supplied and work completed in accordance with the Contract Price, and shall have no basis of a claim for damages or for anticipated profits on the Work that may be dispensed with.

6.13 Shop Drawings and Samples:

6.13.1 The Contractor shall submit to the Project Manager detailed drawings of structures and equipment which are to be incorporated into permanent construction and which are not furnished by the City. Such detailed drawings shall become the property of the City.

6.13.2 The Contractor shall submit to the Project Manager, Shop Drawings for all fabricated materials which are to be incorporated into permanent construction. The Contractor shall not place any final orders for equipment or permit fabrication to begin on such work, until Shop Drawings therefor have been reviewed and accepted by the Project Manager.

6.13.3 The Contractor shall provide the Project Manager with information and Shop Drawings showing the arrangement and locations of temporary structures, bracing, sheeting and equipment, and the Contractor shall not erect or install any such temporary structures without the approval of the Project Manager.

6.13.4 At the time of each submission, the Contractor shall in writing call the Project Manager's attention to any deviations in the Shop Drawings from the requirements of the Contract Documents.

6.13.5 The acceptance of Shop Drawings shall not constitute a waiver of any of the requirements of the Contract Documents, nor shall the City be compelled to accept any structure, equipment or apparatus unless it passes all the tests and requirements of the Specifications. The acceptance of Shop Drawings by the Project Manager shall be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents, and shall not relieve the Contractor of responsibility for the accuracy of such Shop Drawings, for the proper fitting and construction of the Work and for the performance of the Work in a safe manner.

6.13.6 The procedure in seeking acceptance of Shop Drawings being submitted by the Contractor shall be as follows:

A. If the Shop Drawing is larger than 8 1/2" by 14", the Contractor shall submit 1 transparency and 5 prints to the Project Manager for review. If the Shop Drawing is 8 1/2" to 14" or smaller , the Contractor shall submit 3 prints to the Project Manager. The Shop Drawings shall be accompanied by a letter of transmittal, in duplicate, containing the name of the Project, the name of the Contractor, the date of submission, the number of Shop Drawings, bid item number, titles, where in the work the material is proposed to be used and other requirements. Unless otherwise specified, such Shop Drawings shall be submitted or resubmitted at least 14 calendar days before they are required for fabricaion of the materials by the Contractor or Supplier. This time requirement may be reduced only by the written approval of the Project Manager.

B. When a Shop Drawing is satisfactory to the Project Manager, it will be dated and marked or stamped "Accepted" or "Reviewed" by the Project Manager and the transparency or two copies will be returned to the Contractor by mail. When used in regard to Shop Drawings "Accepted" or "Reviewed" shall mean that the Shop Drawings have been reviewed only for general conformance with the design concept of the Project and general compliance with the information given in the Contract Documents.

C. When a Shop Drawing requires correction of a minor detail , the Project Manager will note thereon the corrections required and mark or stamp the Shop Drawing "Furnish as Corrected", and return the transparency or two copies to the Contractor.

D. Should a Shop Drawing be unsatisfactory, the Project Manger will mark or stamp thereon "Rejected;" or "Revise and Resubmit" and return the transparency or two copies thereof to the Contractor with the necessary corrections and changes indicated. The Contractor shall make such corrections and changes and again submit the required transparency or prints of the corrected Shop Drawings, for review.

6.13.7 The Contractor shall submit to the Project Manger for review all samples required by the Contract Documents or by the Project Manger. Samples will be retained by the Project Manger or will become property of the City of Rochester.

6.14 Continuing the Work:

6.14.1 The Contractor shall carry on the Work and maintain the progress schedule during all disputes or disagreements with the City. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as the Contractor and the City may otherwise agree in writing.

6.14.2 The Contractor shall not suspend the Work for more than one work day without written permission from the Project Manager.

6.15 Indemnification:

6.15.1 The Contractor hereby agrees to indemnify, defend and save harmless, the City and its agents and representatives against any and all liability, loss, damage, detriment, suit, claim, demand, cost, charge, attorney's fees and expenses of whatever kind or nature which the City may directly or indirectly incur, suffer or be requried to pay by reasons or in consequence of the carrying out of any of the provisions or requirements of this Contract, where such loss or expense is incurred directly or indirectly by the City, its employees, subcontractors or agents, as a result of the negligent act or omission, breach or fault of the Contractor, its employees, agents or subcontractors. If a claim or action is made or brought against the City for which the Contractor may be responsible hereunder in whole or in part, then it shall be notified and shall be required to handle or pay for the handling of the portion of the claim for which it is responsible as a result of this Section.

6.15.2 The City shall not be held responsible for any damage incurred by the Contractor employed by the City, by other parties, by utility companies or by other government agencies. If the Contractor shall claim compensation for any damage sustained by reason of acts of the City, it shall make a writtten statement to the City Engineer within five days of the first observance of such damage. The written statement shall contain verified, itemized details and amounts of such damage claimed. Unless such statement shall be made, the Contractor's claim for compensation shall be deemed waived and it shall not be entitled to payment of any such damage. It is further agreed that so long as any lawful or proper direction concerning the Work or any product given by the Project Manager shall remain uncomplied with, the Contractor shall not be entitled to have any estimate made for the purpose of payment, nor shall any estimate be rendered on account of work done or material furnished until such lawful or proper direction aforesaid has been fully and satisfactorily complied with.

6.16 Job-Site Meetings:

6.16.1 The Project Manager may schedule periodic or special job-site meetings to review progress of the work and facilitate the resolution of problems. The Contractor and major subcontractors shall be required to attend all job-site meetings and submit written schedules of the remaining work. Interpretations of the Contract Documents may be issued in writing by the Project Manager as a result of such conferences.

6.17 Temporary Utilities:

6.17.1 The Contractor shall be responsible for supplying water and other temporary utilities to the Site. The arrangements for water supply are to be reviewed for approval by the City of Rochester Director of Water.

6.17.2 The Contractor shall observe all sanitary rules and regulations of the State and local health officials and must take such precautions as are necessary to avoid creating unsanitary conditions.

6.17.3 The Contractor shall be responsible for the supplying of temporary heat unless it is otherwise provided for in the Contract Documents. The Contractor further shall be responsible for the supplying of and payment of electricity consumed at the Site in pursuance of the performance of the work of the Contract. Such liability and responsibility shall continue until such time as the City has accepted the Work. In the event that other prime Contractors shall consume electricity, the operating costs thereof shall be apportioned among the Contractors involved.

6.18 Surveys and Stakeouts:

6.18.1 The Contractor shall do all necessary surveying and stakeout work required to construct all elements of the Project as stated in the Contract Documents. The Contractor is responsible for the accuracy of all survey and stakeout work including the verification of existing reference points. The Contractor shall furnish any copies of survey notes requested by the Project Manager.

6.19 Salvage Materials:

6.19.1 The Contractor shall maintain adequate property control records for materials or equipment specified to be salvaged. The Contractor shall be responsible for the adequate storage and protection of salvaged materials and equipment and shall replace salvage materials and equipment which are broken and damaged during salvage operations.

6.19.2 Salvaged material not specified below shall become the property of the Contractor and shall be removed from the site.

6.19.3 The following items must be returned in usable condition to the City of Rochester, to a location specified by the Project Manager during normal business hours:

Survey Monument, Frames and Covers
Tree Grates
Planters
Hydrants and Valves

6.19.4 The following items are to be returned to the Monroe County Department of Pure Waters during normal business hours:

Manhole Frames and Covers
Catch Basin Frames, Grates and Capstones.

6.19.5 The following items are to be returned to the Monroe County Department of Traffic Engineering during normal business hours:

Traffic Signs
Traffic Signal Equipment
Traffic Signal Mast Arms and Poles
Street Signs

6.19.6 Prior to the disturbing or moving of any City of Rochester Survey monument, written permission must be obtained from the City of Rochester, Maps and Surveys Office.

6.19.7 The removal of parking meter heads will be done by the City of Rochester, Division of Municipal Parking.

6.20 Historical and Scientific Specimens:

Articles of historical or scientific value, including, but not limited to coins, fossils and articles of antiquity which may be uncovered by the Contractor during the progress of the work shall become the property of the City of Rochester. Such findings shall be reported immediately to the Project Manger who will determine the method of removal, where necessary, and the final disposition thereof.

ARTICLE 7. WORK BY OTHERS

7.1 The City may perform additional work related to the Project or have additional work performed by utility service companies, or let other direct contracts therefor which shall contain General Terms And Conditions similar to these. The Contractor shall afford the utility service companies and the other contractors who are parties to such direct contracts (or the City, if the City is performing the additional work with the City's employees) reasonable opportunity for the introduction and storage of products and equipment and the execution of work even to the extent of suspending operations to permit other contractors, the utility service companies or the City to obtain and install their equipment without any claim for extra compensation for delay. The Contractor shall properly connect and coordinate its Work with theirs.

7.2 If any part of the Contractor's work depends for proper execution or results upon the work of any such other contractor or utility service company (or the City), the Contractor shall inspect and promptly report to the Project Manager in writing any patent or apparent defects or deficiencies in such work that render it unsuitable for such proper execution and results. The Contractor's failure to so report shall constitute an acceptance of the other work as fit and proper for integration with the Contractor's Work except for latent or non-apparent defects and deficiencies in the other work.

7.3 The Contractor shall do all cutting, fitting and patching of his Work that may be required to make its several parts come together properly and integrate with such other work. The Contractor shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of the Project Manager and the others whose work will be affected.

7.4 If the performance of additional work by other Contractors engaged by the City or utility service companies or the City was not noted in the Contract Documents, and if the Contractor believes that the performance of such additional work requires an extension of the contract time, or resulted in additional costs to the Contractor, the Contractor may make a claim therefore as provided in Section 10.3 of these General Terms and Conditions.

ARTICLE 8. CITY OF ROCHESTER'S RESPONSIBILITIES

8.1 The City shall furnish the data required of the City under the Contract Documents promptly and shall make payments to the Contractor promptly after they are due as provided in Section 13.3 "Review of Applications for Progress Payments".

8.2 The City's duties to provide lands and easements are set forth in Section 5.1 "Availability of Lands". Section 5.2 "Physical Conditions - Investigations and Reports", refers to the City's identifying and making available to the Contractor copies of reports of investigations and tests of subsurface and latent physical conditions at the Site or otherwise affecting performance of the Work, which have been relied upon by the Design Professional in preparing the Drawings and Specifications.

8.3 In connection with the City's rights to request changes in the Work in accordance with Section 10.1 "Changes in the Work", the City is obligated to execute Change Orders.

8.4 The City's responsibility for certain inspections, tests and approvals is set forth in Section 11.3 "Tests and Inspections".

8.5 In connection with the City's right to stop Work or suspend Work, see Section 11.5 "The City May Stop the Work", Section 12.1 "Termination for Default", Section 12.2 "Termination for Convenience of City", and Section 12.3 "Termination for Public Emergency". These Sections deal with the City's right to terminate services of the Contractor under certain circumstances.

ARTICLE 9. CITY ENGINEER'S AND PROJECT MANAGER'S STATUS DURING CONSTRUCTION

9.1 The City of Rochester's Representative:

9.1.1 The City Engineer is the agent of the City. The Project Manager will be the City Engineer's representative during the construction period. The duties and responsibilities and the limitations of authority of the Project Manager as the City's representative during construction are set forth in the Contract Documents. The Contractor shall be informed of any change in the Project Manager's duties and responsibilities.

9.2 Visits to the Site:

9.2.1 The Project Manager will make visits to the Site at intervals appropriate to the various stages of construction to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents.

9.3 Project Manager's Representative, Duties and Responsibilities:

9.3.1 A Project Representative will be appointed by the Project Manager and directed to review all materials used and all work done. The review may extend to all or any part of the Work and to the preparation or manufacture of the materials for use in the Work. Project Representatives are not authorized to revoke, alter, enlarge, or relax any of the provisions of the Contract Documents. The Project Representative on the Work will inform the Project Manager as to the progress of the Work, the manner in which it is being done, and the quality of the materials being used. The Project Representative will also call to the attention of the Contractor any action which the Project Representative believes does not follow the Contract Documents. The Project Representative shall have the authority to prevent the use of any material and to stop any work being done which the Project Representative believes does not conform to the Contract Documents until the question at issue can be referred to and be decided by the Project Manager.

9.4 Clarifications and Interpretations:

9.4.1 The Project Manager will issue with reasonable promptness such written clarifications or interpretations of the Contract Documents as the Project Manager may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents.

9.4.2 Any discrepancy between the Specifications and the Drawings shall be submitted to the Project Manager for interpretation, whose decision thereon shall be conclusive.

9.4.3 The Project Manager will interpret any extra work orders and will decide all other questions in connection with the Work, and issue a change order if necessary.

9.4.4 The Project Manager will review any requested changes to the Contract Documents and will either reject such changes or recommend their full or partial approval to the City Engineer. It shall be understood that fulfillment of these items is contingent upon the City Engineer's authorization.

9.5 Rejecting Defective Work:

9.5.1 The Project Manager will have the authority to disapprove or reject Work or materials which are defective, and will also have authority to require special inspection or testing of the Work or materials, whether or not the Work or materials are fabricated, installed or completed.

9.6 Shop Drawings, Change Orders and Payments:

9.6.1 The Project Manager will be responsible for the review and the acceptance or rejection of Shop Drawings.

9.6.2 The Project Manager will also be responsible for the initial review of Change Orders and Applications for Payment. Upon completion of the review, the Project Manager will either reject the Change Orders and Applications for Payment or recommend their authorization by the City Engineer. It shall be understood that fulfillment of these items is contingent upon the City Engineer's authorization.

9.7 Resolutions of Disputes:

9.7.1 The Project Manager will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder.

9.7.2 A direction, order, or decision of the Project Manager affecting the performance of Work yet to be performed (including the reconstruction or replacement of unsatisfactory Work) shall be final and conclusive upon the Contractor, and the Contractor shall conform thereto in the future performance of the Work.

9.7.3 If the Contractor claims compensation for any damages sustained by reason of any act or omission of the City, its agents, or employees, or for any other reason whatsoever, it shall, within ten (10) days after such claim shall have arisen, file with the City Engineer written notice of its intention to make claim for such damages. Such notice shall state the nature and amount of the damages sustained and the basis of the claim against the City. If the City Engineer shall deem it necessary for proper decision upon any notice filed hereunder, to require additional data, depositions or verified statements, the Contractor must furnish the same within ten (10) days after written demand therefor.

9.7.4 The filing by the Contractor of a notice of claim and the compliance by the Contractor with the demand, if any, for additional data, depositions or verified statements, both within the time limit herein, shall be a condition precedent to the settlement of any claim or to the right to resort to any other remedy, proceeding or action. The failure of the Contractor to file a notice of claim and, if required by the City Engineer, to furnish additional data, depositions and verified statements, both within the time limit herein, shall be deemed to be a conclusive and binding determination on its part that the Contractor has no claim against the City for compensation for extra work or for compensation for damages, as the case may be, and shall be deemed a waiver by the Contractor of all claims for additional compensation or for damages.

9.7.5 The filing of a notice of claim and the furnishing of any data, depositions or verified statements requested by the City shall not be deemed an admission of the City's liability, nor raise any presumption as to the validity or correctness of the claim. The question as to whether or not the Work required is Extra Work or as to whether or not the Contractor is entitled to compensation for damages shall be determined by the City Engineer which determination shall be final and binding upon the Contractor. In the case of a claim by the Contractor as above provided that any instructions of the Project Manager involve Extra Work, the Contractor shall not in any event proceed with the execution of the Work involved until it shall have received the City Engineer's decision or instruction relative thereto.

9.7.6 The rendering of a decision by the City Engineer with respect to any claim, dispute or other matter (except any which have been waived by the making or acceptance of payment of the contract balance less any withheld sum) will be a condition precedent to any exercise by the City or the Contractor of such rights or remedies as either may otherwise have at law in respect of any such claim, dispute or other matter.

9.8 Limitations on Project Manager's and Project Representative's Responsibilities:

9.8.1 Neither the Project Manager's or Project Representative's authority to act under this Article or elsewhere in the Contract Documents, nor any decision made by the Project Manager in good faith either to exercise or not to exercise such authority, shall give rise to any duty or responsibility of the Project Manager to the Contractor, any subcontractor, any manufacturer, fabricator, supplier or distributor, or any of their agents or employees, or any other person performing any of the Work.

9.8.2 Whenever in the Contract Documents the terms "as ordered", "as directed", "as required", "as allowed", or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper", or "satisfactory" or adjectives of like effect or import are used, to describe a requirement, direction, review or judgment of the Project Manager as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective never indicates the Project Manager shall have the authority to supervise or direct performance of the Work or authority to take responsibility for any part of the Work.

9.8.3 The Project Manager or Project Representative will not be responsible for the Contractor's means, methods, techniques, sequences or procedures of construction, or the safety programs and precautions incident thereto, and the Project Manager and Project Representative will not be responsible for the Contractor's failure to perform the Work in accordance with the Contract Documents.

9.8.4 The Project Manager or Project Representative will not be responsible for the acts or omissions of the Contractor or of any subcontractor or of any other persons at the Site or otherwise performing any of the Work.

ARTICLE 10. CHANGES DURING THE PROJECT

10.1 Changes in the Work:

10.1.1 The City and the Contractor shall have the right to agree by Change Order or Field Order to make changes in, additions to, or deductions from the Work and changes in completion time required by the Contract Documents; provided that if changes, additions, or deductions are made, the general character of the Work as a whole is not changed. Where the City and the Contractor cannot agree on a Change Order or Field Order, the City shall have the right to issue a Change Order or Field Order without the Contractor's agreement. The Contractor shall proceed with the Order in any case.

10.1.2 The Project Manager may authorize by Field Orders minor changes in the Work which are consistent with the overall intent of the Contract Documents. Minor changes may involve an adjustment to Contract unit quantities at their unit price. A Field Order shall be binding on the City, and also on the Contractor who shall perform the change promptly. Changes involving an adjustment in Contract unit prices or the addition of new work at new prices or a change in Contract time are subject to the requirements of Sections 10.2 and 10.3 of these General Terms and Conditions.

10.1.3 Adjustment in the Contract Price shall be determined as provided in Section 10.2 below and any claim for extension of time for completion shall be determined as provided in Section 10.3.

10.1.4 If the Contractor believes that a Field Order justifies an increase in the Unit Price of an item or contract time, the Contractor may make a claim thereof, as provided in Section 10.2 and Section 10.3. No claim for adjustment of price or extension of time shall be allowed unless done in pursuance of a Change Order.

10.1.5 Written notice of claims for an adjustment of contract price or time due to changes in the Work shall be made by the Contractor to the City Engineer before the commencement of the Work. The City Engineer shall make a decision on the claim as provided in Section 9.7. The City Engineer may direct the work to proceed while reserving a decision on the amount of contract price change (if any) and the Contractor must proceed with the work during this time period (See Article 6.14 of these General Conditions). Where the Change Order diminishes the quantity of the Work to be done, it shall not constitute a basis for a claim for damages of anticipated profits on Work that may be dispensed with.

10.1.6 It shall be understood and agreed that when any change in, addition to, or deduction from the Work is required, such changes are subject to the requirements of the Contract Documents. Any change, addition to, or deduction from the Work shall not in any way invalidate the Contract and shall not affect or discharge the bond furnished by the Contractor.

10.1.7 The Contractor, without charge, shall make such slight alterations as may be necessary to make adjustable parts fit to fixed parts or portions of the Project, leaving all complete and in proper shape when done.

10.2 Changes in the Contract Price:

10.2.1 The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to the Contractor for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by the Contractor shall be at its expense without change in the Contract Price. The City reserves the right, at any time during the process of the Work, to alter Drawings, or omit any portion of the work as it may deem reasonably necessary for the public interest; making allowances for additions and deductions at the prices named in the Bid for this Work, without constituting grounds for any claim by the Contractor for allowance for damages or for loss of anticipated profits, or for any variations between the approximate quantities and the quantities of the Work as done.

10.2.2 Adjustments, if any, in the Contract Price by reasons of change in the Work shall be specified in a Change Order signed by the City Engineer. Adjustments are to be determined by one or more of the following

methods, the City reserving the right to select the method or methods at the time the written Change Order is issued. Agreed prices for new items of work or products may be incorporated in the Change Order as the City may deem them to be just and fair and beneficial to the City. These prices will be used in computing the Final Estimate. Agreed prices must be supported by a complete price analysis in the Change Order from the Contractor. The agreed price shall be based on one of the following methods unless another method is approved by the City Engineer:

A. Unit Prices. The unit prices may be those in the original Bid, Contingent Unit Prices or fixed by agreement between the City and the Contractor.

B. An Acceptable Lump Sum. A lump sum mutually agreed upon by the City and the Contractor. As such, the lump sum proposal shall include sufficient information with an appropriate breakdown of the contractor's cost for material, equipment and labor.

C. On a Time and Materials or Cost-Plus Basis. By reason of the change in work, the contractor shall be paid the actual and reasonable cost of the following:

1) Necessary Materials (including transportation to the Site). Materials used, if acquired by direct purchase, must be covered by bills or acceptable invoices. All prices on used materials incorporated in either temporary or permanent Work shall be billed at a fair value, less than the original cost when new. A reasonable salvage credit shall be given for all salvageable materials recovered. Salvage value of substantial materials recovered must be determined jointly by the Contractor and the Project Manager.

2) Necessary labor costs including supplemental benefit payments. Each class of labor shall be billed separately at actual payroll rates. Average rates based on different classes of labor will not be accepted.

3) Necessary payroll taxes and insurance payments and other such reasonable charges that are paid by the Contractor pursuant to existing written agreements with its employees and/or labor organizations.

4) Sales taxes, if any, required to be paid on rental equipment or materials not permanently incorporated into the work.

5) Equipment, truck and plant rentals other than small tools. The actual additional cost incurred for necessary equipment. Costs shall not be allowed in excess of usual rentals charged in the Rochester area for similar equipment of like size and condition.

No cost shall be allowed for the use of equipment on the Site in connection with other work unless its use incurs actual and additional costs to the Contractor. The number of hours to be paid for shall be the number of hours that the equipment or plant is actually used for the specified force account Work. If equipment not on the Site is required for the change in Work only, the cost of transporting the equipment to and from the site will be allowed. The equipment used by the Contractor shall be specifically described by the manufacturer and model number and be of suitable size and suitable capacity required for the Work to be performed. In the event the Contractor elects to use equipment of a higher rental value than suitable for the Work, payment will be made at the rate applicable to the suitable equipment. The equipment actually used and the suitable equipment paid for will be recorded as part of the records for work done on a time and materials or cost-plus basis. The Project Manager shall determine the suitability of the equipment. If there is a differential in the rate of pay of the operator of oversize or higher rate equipment, the rate paid for the operator will likewise be that for the suitable equipment.

a) Contractor Owned Equipment, Trucks and Plant. Contractor shall be reimbursed for his ownership costs and for his operating costs for self owned equipment at the rates listed in the Rental Rate Blue Book published by Dataquest Inc. applied in the following manner:

[1.0] Ownership Costs. It is mutually understood that the rates for ownership costs reimburse the Contractor for all nonoperating costs of owning the equipment, truck or plant and shall include depreciation on the original purchase, insurance, applicable taxes, interest on investment, storage, overhead, repairs, and profit. Reimbursement will be made for the hours of actual use as described below:

[1.1] Less than 8 hours of actual use: the product of the actual number of hours used or fraction thereof multiplied by the hourly rate, or the daily rate, whichever is less.

[1.2] Between 8 hours and 40 hours of actual use: the product of the actual number of hours used divided by 8 multiplied by the daily rate, or the weekly rate, whichever is less.

[1.3] Between 40 and 176 hours of actual use: the product of the actual number of hours used divided by 40 multiplied by the weekly rate, or the monthly rate, whichever is less.

[1.4] Over 176 hours of actual use: the product of the actual number of hours used divided by 176 multiplied by the monthly rate.

[2.0] Operating Costs. The rate for operating costs includes fuel, lubricants, other operating expendables, and preventative and field maintenance. Operating cost does not include the operator's wages. The Contractor shall be reimbursed the product of the number of hours of actual use multiplied by the Estimated Operating Cost/Hour.

[3.0] The rates used shall be those in effect at the time the force account work is done as reflected in the then current publication of the Rental Rate Blue Book. (When force account type analysis are used to establish agreed prices in accordance with Section 10.2.2 above, the rates used shall be those in effect when the agreed price is developed by the Contractor and submitted to the Project Site Representative).

[4.0] The Geographic Area Adjustment Factor shown on the map at the beginning of each section of the Rental Rate Blue Book shall not be applied to the equipment rates subsequently listed in each section, and shall not be used as a basis for payment.

[5.0] In the event that a rate is not established in the Rental Rate Blue Book for Construction Equipment for a particular piece of equipment, truck or plant, the Project Manager shall establish rates for ownership costs and operating costs for that piece of equipment, truck or plant that is consistent with its cost and expected life.

b) Rented Equipment, Trucks and Plant:

[1.0] In the event that the Contractor does not own a specific type of equipment and must obtain it by rental, it shall be paid the actual rental rate for the equipment for the time that the equipment is used to accomplish the work or is required by the Project Representative to be present, not to exceed the rental rate in the Rental Rate Blue Book, plus the reasonable cost of moving the equipment onto and away from the work site.

[2.0] The Contractor shall also be reimbursed for the operating cost of the equipment unless reflected in the rental price. Such operating cost shall be determined in the same manner as specified for Contractor Owned Equipment above.

[3.0] In the event that area practice dictates the rental of fully manned or fueled and maintained equipment, truck or plants, payment will be made on the basis of an invoice for the rental of the fully

manned, fueled and/or maintained equipment, trucks or plants including all costs incidental to its use, including costs of moving to and from the site, provided the rate is substantiated by area practice.

c) Maximum Amount Payable. The maximum amount of reimbursement for the ownership costs of Contractor owned or rental cost of rented equipment, trucks or plant is limited to the original purchase price of the equipment, truck or plant for any work as listed in the Green Guide for Construction Equipment published by Dataquest Inc. In the specific event when the ownership or rental reimbursement is limited by the original purchase price, the Contractor shall, nevertheless, be reimbursed for the Operating Cost/Hour for each hour of actual use.

6) Profit and Overhead. Profit and overhead cost shall be computed at 20 percent of the following:

a) Total Direct Labor Cost (actual hours worked multiplied by the basic hourly wage rate) plus supplemental benefits payments, payroll taxes, insurance payments and other labor related fringe benefit payments as defined in 10.2.2C.2 and 10.2.2C.3, but not including the overtime additive payments. Profit and overhead shall not be paid on the premium portion of overtime.

b) Total Cost of Materials as defined in 10.2.2C.1 including the cost of transportation to the work site.

7) Overhead shall be defined to include the following:

a) Premium on bond;

b) Premium on insurance required by the State other than Workers' Compensation Insurance, premium on public liability and property damage insurance, unemployment insurance, Federal old-age benefits, other payroll taxes and such reasonable charges that are paid by the Contractor pursuant to written agreement with its employee;

c) All salary and expenses of executive officers, supervising officers or supervising employees;

d) All clerical or stenographic employees;

e) All charges for minor equipment such as small tools, including shovels, picks, axes, saws, bars, sledges, ladders, lanterns, jacks, cables, pails, wrenches, etc., and other miscellaneous supplies and services;

f) All drafting room accessories such as paper, tracing cloth, reproduction costs, etc.

8) Subcontractor Charges. When the work is performed by a subcontractor, the Contractor shall be paid the actual and reasonable cost of such subcontracted work as outlined above, except that profit and overhead shall be figured at twenty-five (25) percent unless some other basis is approved by the City Engineer. In cases where the subcontractor's costs are submitted as a lump sum, the Contractor shall be allowed ten (10) percent for profit and overhead.

D. Time and Materials Report. Payment for work done on a time and materials basis will be made on the basis of the following reports.

1) The Contractor will deliver to the Project Representative a daily summary of TIME AND MATERIAL WORK done on the contract. This summary on 8 1/2" x 11" paper will be delivered to the Project Representative not later than closing time on the day following that for which the work is reported.

The summary shall contain:

a) A list of materials used indicating the amount and nature of each material. The cost (if known) should also be included. This must be documented later by proper receipts.

b) A list of equipment used indicating the number of hours used and the kind, type, and size of equipment.

c) A list of personnel by name, including the hours worked, and labor classification at which they were used on the force account work and the location of the work.

d) A statement of the work accomplished on a time and materials basis for that day.

e) This summary will be dated and signed by the Contractor's superintendent or authorized representative and the Project Representative.

f) The contract number and Project Title as well as the name of the Contractor shall appear on the statement.

g) The Project Representative will make any notations, remarks or comments on this form that may assist in final payments.

2) On completion of the specific work done on a time and materials basis, the Contractor shall within 10 calendar days, deliver to the Project Representative a Time and Materials Summation wherein all materials, equipment, and labor charges are shown and totaled together with such other expenditures as are concerned with the force account item. This summation shall be dated and signed by the Contractor's authorized representative and reviewed by the Project Manager.

10.2.3 The City Engineer will limit the total cost for an item of Extra Work authorized under this Article, to a stipulated sum agreed to in writing prior to completion of the Extra Work.

10.2.4 If the Contractor is required to work outside of normal working hours, such as weekends or nights, because of unanticipated conditions at the Site, the Contract Price shall be adjusted as described in paragraph 10.2.2 for only the documented additional cost of labor overtime or extra material charges. Payment for overhead and profit will not be included.

10.2.5 If the Contractor claims that any instructions of the Project Manager involve Extra Work entailing a change in Contract Price, it shall, within ten (10) days after the receipt of such instructions, and before proceeding to execute the Work, file with the City Engineer written notice of its intention of making a claim for extra compensation. Such notice shall state the amount and character of the Work which it deems should be treated as Extra Work, and its reasons therefore. The City Engineer shall make a decision on the dispute as provided in Section 9.7. Upon a decision or direction from the City Engineer, the Contractor shall proceed with the work in question.

10.2.6 Asphalt Price Adjustment:

This adjustment will provide for either an additional compensation to the Contractor or a repayment to the City, depending upon an increase or decrease in the price of asphalt. Only those asphalt contract items enumerated below will be eligible for a price adjustment:

403.11, 403.13, 403.1901, 403.21

The adjustment will be based only on the Quantity of Asphalt incorporated in the work multiplied by the difference

between a fixed Index Price plus $10.00 (minus $10.00 when price decreases) and the Average Posted Price, all as defined below:

Quantity of Asphalt (Tons) in the material incorporated in the work shall be computed for each item as follows:

Asphalt Concrete (Tons) x Asphalt Concrete Factor (%)

Item No.	Factor	Recycled Factor
403.1	0.060	0.041
403.13	0.065	0.046
403.1901	0.080	0.055
403.21	0.080	

Index Price: A fixed price (See Supplementary Terms and Conditions) per ton of asphalt which equals the current average FOB terminal price for AC-10 and AC-20 asphalt cement, without anti-stripping agent, at the following five locations:

ARCO	Philadelphia, PA
ASHLAND	Buffalo, NY
CHEVERON	Perth Amboy, NY
MARATHON	Buffalo, NY
EXXON	Bayonne, NJ

This price is used solely as a base from which to compute price adjustments.

Average Posted Price: The average monthly FOB terminal price for AC-10 or AC-20 asphalt cement, without anti-stripping agent, at the above five locations during the life of this contract. This will be updated based on postings of the third Wednesday of each month.

Also all discounts or allowances that reduce the asphalt price at the terminal will be deducted prior to calculating the Price Adjustment.

Price Adjustment will be based on the following formulas:

A. When price increases:

Price Adjustment = Quantity of Asphalt x [(Average Posted Price)- (Index Price + $10.00)]

B. When price decreases:

Price Adjustment = Quantity of Asphalt x [(Average Posted Price)- (Index Price - $10.00)]

A Price Adjustment will be paid in addition to or deducted from (if the price decreases) the Monthly Estimate for material placed during the previous month. The Average Posted Price will be updated on the third Wednesday of each month and the Price Adjustment will become effective on the first of the following month. All price changes received after the third Wednesday of the month will be held in abeyance until the next scheduled price revision.

This Asphalt Price Adjustment is based solely on changes in the price of AC-10 and AC-20 asphalt cement without anti-stripping agent. The fact that an individual asphalt supplier's price exceeds the Average Posted Price or that of a particular asphalt item such as emulsion base is more costly than AC-10 or AC-20 will have no bearing on the Price Adjustment.

If asphalt items are placed after the completion date specified in this Contract or after any extensions of that date with engineering charges and/or liquidated damages, the Average Posted Price used to compute Price Adjustments shall not exceed the Average Posted Price on the original scheduled contract completion date. If the contract completion date is extended without the assessment of engineering charges, Price Adjustments for material placed during such extensions shall be based on the latest updated Average Posted Price.

No price adjustment will be made unless the Average Posted Price is either $10.00 greater than or less than the Fixed Index Price stated above. All Price Adjustments will be rounded to the nearest dollar.

10.3 Changes in the Contract Time:

10.3.1 Changes in the contract time caused by changes in the Work shall be specified in a Change Order signed by the City Engineer.

10.3.2 Any claim for an extension in the contract time shall be based on written notice delivered to the City Engineer within fifteen days of the occurance of the event giving rise to the claim. The City Engineer shall make a decision on the claim as provided in Section 9.7.

10.3.3 If the Contractor finds that it will be impossible to complete the Work within the calendar days stipulated in the Contract Documents or on or before the completion date stipulated in the Contract Documents, it shall make written application to the City Engineer for an extension of time for completion. The Contractor shall set forth full, in its request, the reasons which it believes would justify the City's grant in its request. If the City Engineer finds that the Work was delayed on account of condtions beyond the control of the Contractor, a Change Order may be issued granting an extension of the time for completion until such date that appears reasonable and proper. This date shall be considered as in full force and effect as though it were the date originally stipulated. Such extensions of time shall not change or alter any other conditons of the Contract and shall not be deemed a waiver by the City of any of its rights under the Contract or relieve the contractor from full responsibility of its obligations.

10.3.4 If because of any act or omission of the City, or its officers, agents or employees, whether occurring before or after the acceptance of the Contractor's Bid or the execution of the Contract, or of any contractor of the City engaged in operations upon the Site, or because of any strike, embargo upon shipments, insurrection, act of public enemy, earthquake or lightning strike, or because of any storm, fire, or flood, the completion of the Work, or any part thereof is necessarily delayed, without fault of the Contractor, beyond the time of completion of the Work, or the particular portion thereof affected, the City shall not be liable or responsible or answerable in any way for any damage caused thereby and no compensation shall be paid to the Contractor because of any suspension of work or delay in its performance. Any extension of time, which may be granted as herein provided, shall be in lieu of, and in liquidation of, any claim against the City for any damages to the Contractor, because of any delay due to any of the above causes.

10.4 Liquidated Damages:

10.4.1 Should the Contractor fail to Substantially Complete (See Article 14) the Work within the calendar days stipulated in the contract documents or on or before the completion date stipulated in the Contract Documents or should the Contractor fail to complete punch list requirements in the time required (see Article 14) or within such extended time as may have been allowed for Substantial Completion or punch list requirements by change order or by written directive of the City Engineer, the Contractor shall be liable to the City of Rochester in the amount shown in the following schedule of deductions, not as a penalty but as liquidated damages, for each calendar day of overrun in the contract time or such extended time as may have been allowed.

Schedule of Deductions for Each Calendar Day of Overrun in Contract Time

ORIGINAL CONTRACT AMOUNT From More Than	To And Including	Liquidated Damages Per Calendar Day
$ 0	$ 25,000	$ 50
25,000	50,000	75
50,000	100,000	200
100,000	500,000	300
500,000	2,000,000	500
2,000,000	5,000,000	600
5,000,000	10,000,000	800
10,000,000	15,000,000	1,000
15,000,000	OVER	***

***Will be as specified in the Contract Documents, Supplementary Terms and Conditions.

ARTICLE 11. WARRANTY AND GUARANTEE; TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

11.1 Warranty and Guarantee:

11.1.1 The Contractor warrants that the Work performed under this Contract conforms to the requirements of the Contract Documents and is free of any defect of equipment, material or design furnished, or workmanship performed by the Contractor or any of its subcontractors or suppliers at any tier. Such warranty shall continue for a period of two (2) years from the date of certification of Substantial Completion of the Work. Under this warranty, the Contractor or its surety shall remedy any such failure to conform or any such defect at any time during the two-year warranty period. The Contractor or its surety shall be liable for the expenses of all corrective work including the cost of any professional services incurred by the City due to the defective work. If the Contractor or its surety does not correct any defect within 60 calendar days of written notification from the City of such defect or in an emergency situation where delay would cause serious risk of loss or damage, the City may have the defective Work corrected or removed and replaced. All direct and indirect costs of such removal and replacement, including compensation for additional professional services related to the removal and replacement, shall be paid by the Contractor. In addition, the Contractor shall remedy at the contractor's expense any damage to the City owned or controlled real or personal property, when that damage is the result of the Contractor's failure to conform to the requirement of the Contract Documents or any such defect of equipment, material or workmanship. The Contractor shall also restore any Work damaged in fulfilling the terms of this clause. The Contractor's warranty with respect to Work repaired or replaced hereunder will run for two (2) years from the date of acceptance of such repair or replacement.

11.1.2 The City shall notify the Contractor in writing within a reasonable time after the discovery of any failure, defect or damage.

11.1.3 All subcontractors', manufacturers' and suppliers' warranties express or implied, respecting any Work and materials, shall be enforced by the Contractor for the benefit of the City. The Contractor shall obtain any warranties which the subcontractors, manufacturers or suppliers would give in normal commercial practice.

11.1.4 The warranty specified herein shall not limit the City's right under any inspection or acceptance clauses of this Contract with respect to latent defects, gross mistake or fraud.

11.1.5 Prior to the acceptance of the Work, the Contractor shall furnish to the City a Guarantee Bond, as set forth in Article 4, Bonds and Insurance, of these General Terms and Conditions.

11.1.6 Prior to the acceptance of any work corrected under the terms of this warranty the Contractor or its surety shall, when required in writing by the City, furnish to the City a Guarantee Bond, as set forth in Article 4, Bonds and Insurance, of these General Terms and Conditions.

11.2 Access to Work:

11.2.1 The Project Manager, other representatives of the City, testing agencies and governmental agencies with jurisdictional interests will have access to the Work at reasonable times for their observations, inspection and testing. The Contractor shall provide proper and safe conditions for such access.

11.3 Tests and Inspections:

11.3.1 All material and workmanship (if not otherwise designated by the Specifications) shall be subject to inspection, examination, test and retest (if rejected) by the Project Manager at any and all times during manufacture or construction and at any and all places where such manufacture or construction are carried on.

11.3.2 The Contractor shall give the Project Manager timely notice of readiness of the Work for all required inspections, tests or approvals.

11.3.3 If any law, ordinance, rule, regulation, code, or order of any public body having jurisdiction requires any Work (or part thereof) to specifically be inspected, tested or approved, the Contractor shall assume full responsibility therefor, pay all costs in connection therewith and furnish the Project Manager the required certificates of inspection, testing or approval. The Contractor shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with the Project Manager's acceptance of a material manufacturer, fabricator, supplier or distributor of materials or equipment proposed to be incorporated in the Work, or of materials or equipment submitted for approval prior to the Contractor's purchase thereof for incorporation in the Work. The cost of all other inspections, tests and approvals required by the Contract Documents shall be paid by the City (unless otherwise specified).

11.3.4 All inspections, tests or approvals for which the Contractor must assume full responsibility and must pay for shall be performed by organizations acceptable to the Project Manager. Any objections by the Contractor to an organization must be stated in writing at the time of selection of the organization.

11.3.5 Neither observations by the Project Manager nor inspections, tests or approvals by others shall relieve the Contractor from its obligations to perform the Work in accordance with the Contract Documents.

11.4 Uncovering Work:

11.4.1 If any Work is covered without the approval or consent of the Project Manager, it must, if requested by the Project Manager, be uncovered for the Project Manager's observation and replaced at the Contractor's expense.

11.4.2 In cases where Work was covered with the Project Manager's consent, but the Project Manager has reason to believe that covered Work is defective, the Contractor, at the Project Manager's request, shall uncover, expose or otherwise make available for observation, testing or inspection as the Project Manager may require that portion of the Work in question, furnishing all necessary labor, material and equipment. If the work is found to be defective, in any respect, due to the fault of the Contractor or any Subcontractor including suppliers of material, the Contractor shall be liable for the expenses of such examination including the cost of any professional services incurred by the City due to the defective work. If, however, the Work is found not to be defective, payment shall be made on a Time and Materials basis as provided in Section 10.2.2C.

11.5 The City May Stop the Work:

11.5.1 The Project Manager shall have authority to suspend the Work for periods not to exceed 24 hours. Extensions of any 24-hour suspension must be approved by the City Engineer.

11.5.2 If the Work is defective, or the Contractor fails to supply sufficient skilled workers or suitable materials or equipment, the Project Manager may order the Contractor to stop the Work, or any portion of it, until the cause for such order has been eliminated.

11.5.3 The Project Manager shall also have authority to suspend the Work in whole or in part on account of unfavorable weather conditions or any other conditions, which in the Project Manager's judgment makes it impracticable to secure satisfactory work. The Contractor shall suspend operations, in whole or in part, as directed in writing by the Project Manager. Notwithstanding the foregoing, the Work also may be ordered suspended pursuant to Section 11.3 hereof, "Tests and Inspections".

11.6 Correction or Removal of Defective Work:

11.6.1 If required by the Project Manager, the Contractor shall promptly, without cost to the City and as specified by the Project Manager, either correct all defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by the Project Manager, remove it from the Site and replace it with nondefective Work.

11.6.2 If the Contractor claims any damages as a result of the Project Manager's order regarding defective Work, it may make an appeal to the City Engineer as provided in Section 9.7.

11.7 Acceptance of Defective Work:

11.7.1 If instead of requiring correction or removal and replacement of defective Work, the City prefers to accept it, the City has the option to do so. In such case, if acceptance occurs prior to the Project Manager's recommendation of final payment, a Change Order shall be issued incorporating the necessary revisions in the Contract Documents, including appropriate reductions in the Contract Price; or if the acceptance occurs after, an appropriate amount shall be paid by the Contractor to the City.

11.8 The City May Correct Defective Work:

11.8.1 If the Contractor fails after five (5) days written notice from the Project Manager to proceed to correct defective Work or to remove and replace rejected Work as required by the Project Manager or if the Contractor fails to perform the Work in accordance with the Contract Documents, the City may without prejudice to any other remedy, and without notice to any Surety or Sureties on any bonds furnished hereunder, make good all work, material, omission or deficiencies, and may deduct the cost and damages thereof including the cost of any professional services from the payment then due or which may thereafter become due the Contractor. To the extent necessary to complete corrective and remedial action, the City may exclude the Contractor from all or part of the Site, take possession of all or part of the Work, and suspend the Contractor's services related thereto, take possession of the Contractor's tools, appliances, construction equipment and machinery at the Site and incorporate in the Work all materials and equipment stored at the Site or for which the City has paid the Contractor, but which are stored elsewhere. The Contractor shall allow the City and its representatives, agents and employees such access to the Site as may be necessary to enable the City to exercise its rights under this section.

The opinion or decision of the City Engineer in all instances that may arise in the manner aforesaid and the certificate of the City showing the expense incurred by the City by reason of its action under this section shall be final and conclusive upon the Contractor. But no action taken by the City hereunder shall affect any of the other rights or remedies of the City granted by the Contractor or by law or relieve the Contractor from any consequences or liabilities arising from such acts or omissions.

ARTICLE 12. TERMINATION

12.1 Termination for Default:

12.1.1 The City may serve written notice upon the Contractor and its Surety of its intention to terminate the Contract:

A. If the Contractor should fail to begin the Work to be done under the Contract Documents at the designated time; or

B. If, in the opinion of the City Engineer and the City Engineer so certifies in writing, the performance of the Work is being unnecessarily or unreasonably delayed; or

C. If the Work is not completed within the time originally specified, or within the time to which the completion of the Work may have been extended; or

D. If the Contractor shall be executing the Work with an insufficient force of workers, or an inadequate construction plant, or with an insufficient supply of satisfactory material for the prompt completion of the Work; or

E. If the Contractor shall fail to make prompt payments for labor or material, or to subcontractors; or

F. If the Contractor shall willfully violate any of the conditions and covenants of the Contract Documents, or disregard laws, ordinances, or instructions of the Project Manager; or

G. If the Contractor shall abandon the Work; or

H. If the Contract or any part thereof, be assigned, transferred or sublet without the written approval of the City; or

I. If the Contractor shall become insolvent, adjudged bankrupt; or

J. If, at any time, any City official, or employee has or shall become directly or indirectly financially interested in the Contract; or

K. If the Contractor shall refuse to remove such materials or to perform any such Work as shall have been rejected as defective or unsuitable; or

L. If the Contractor, or any of its subcontractors, fail in the Contract herein contained.

12.1.2 Such written notice to the Contractor and its Surety shall contain the reasons for the intention to terminate the Contract. If the Contractor or its Surety fail, within a period of five (5) work days, after such notice to proceed satisfactorily with the Work, and comply with such notice, the City shall have full power and authority, without violating the Contract Documents, to take over the Work from the Contractor or its Surety, to appropriate or use any or all products and equipment on the Site as may be acceptable and may enter into a contract for the completion of the Work according to the Contract Documents, or use such methods as in its opinion shall be required for the proper completion of the Work. The costs and charges incurred by the City, together with the costs of completion of the Work, shall be deducted from any monies due or which may become due to the Contractor. In case the expense so incurred by the City is greater than the sum which would have been payable under the Contract, the Contractor or its Surety shall pay to the City, within 60 days on demand, the amount of said excess. Any payments received after the 60 day time period shall be charged interest at the prevailing rate.

12.1.3 In the event the Contractor shall fail or refuse to regard laws, ordinances or the instructions of the City or otherwise be guilty of a substantial violation of any provision of the Contract Documents, then the City, without prejudice to any other rights or remedy it may have, may by five (5) days notice to the Contractor terminate the employment of the Contractor and his right to proceed, either as to the entire Work or as to any portion thereof and may take possession of the Work and complete the Work by contract or otherwise as the City may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the compensation to be paid the Contractor hereunder shall exceed the expense of so completing the Work (including compensation for additional managerial, administrative engineering, and inspection services and any damages for delay) such excess shall be paid to the Contractor.

If such expense to complete the work exceeds the unpaid balance, the Contractor and his Sureties shall be liable to the City for such excess. If the right of the Contractor to proceed with the Work is so terminated, the City may take possession of and utilize in completing the Work such Products, appliances, supplies, plant and equipment as may be on the Site of the Work and necessary therefor.

12.2 Termination for Convenience of City:

12.2.1 The Contract may be terminated by the City in accordance with this Section in whole, or in part, whenever for any reason, the City shall determine that such termination is in the best interest of the City. Any such termination shall be effective upon written notice to the Contractor.

12.2.2 If the Contract is so terminated, the City may take over the Work and execute the same to completion by contract or otherwise. The Contractor, upon such termination, shall transfer title, and in the manner directed by the City, shall deliver to the City the completed or partially completed, Drawings, information, other property and records of Work being performed, which, if this Contract had been completed, would be required to be furnished to the City.

12.2.3 After receipt of written notice of termination, the Contractor shall promptly submit to the City its termination claim in a form acceptable to the City. Such claim shall in no event be submitted later than one year from the effective date of termination.

12.2.4 In the event that the parties cannot agree, in whole or in part, as to the amount due by reason of the termination of the Contract pursuant to this clause, the City shall pay the Contractor the amount determined as the total of the following:

A. The cost of all Work performed prior to the effective date of termination;

B. The cost of settling and paying claims arising out of and as a direct result of the termination;

C. In lump sum Contracts, a sum as profit on subdivision A above, determined to be fair and reasonable, provided however, that if the Contractor would have sustained a loss on the entire Contract had it been completed, no profit shall be included or allowed under this subdivision C, and an appropriate adjustment shall be made reducing the amount of settlement to reflect the indicated rate of loss. The total sum to be paid under this subdivision C shall not exceed the total price of this Contract, reduced by the amounts otherwise made, and further reduced by the value of work remaining incomplete at the time of the termination of this Contract; and

D. In unit price Contracts, profit is already computed in the unit prices. In such Contracts, no further sum will be allowed as profit.

12.3 Termination for Public Emergency:

12.3.1 The City shall maintain the right to terminate the contract without further liability to the Contractor in the event of an emergency situation which poses a threat to the safety and welfare of the public. Such right to terminate shall be exercised only upon the written opinion of the Commissioner of the Department of Environ-

mental Services or the City Engineer, that it is necessary to terminate the contract in the interest of the public health, safety and welfare. However, in the event of an emergency declared by the Mayor, State of New York, or United States Government for the area encompassing the contract project area, it shall not be necessary to have a written opinion from the Commissioner of the Department of Environmental Services or the City Engineer as described herein.

12.4 Contractor's Right to Terminate:

12.4.1 Inasmuch as the Contractor agrees that it can be adequately compensated by money damages for any breach of the Contract which may be committed by the City, the Contractor expressly agrees that no default, act, or omission of the City shall constitute a material breach of the Contract entitling the Contractor to cancel or rescind it or (unless the City shall so direct in writing) to suspend or abandon performance; and the Contractor hereby waives any and all rights and remedies to which it might otherwise be or become entitled because of any wrongful act or omission of the City, saving only its right to money damages to be determined as provided in Section 9.7 "Resolutions of Disputes".

12.4.2 However, the Contractor may terminate the Contract upon ten (10) days notice to the City Engineer, if the Work should be stopped under an order of any court, or other public authority for a period of three months, through no act or fault of the Contractor or of anyone employed by it; or if the City should fail to pay the Contractor any sum certified by the City Engineer within sixty days of its maturity and presentation, provided no appeal is taken. Upon termination of the Contract, the Contractor shall receive from the City payment in full for all Work executed and/or materials delivered to the Site, as determined from prices contained in the detailed Bid or from the breakdown of a unit price or lump sum price Bid. No claim for extra compensation or damages shall be made by the Contractor or allowed by the City because of such termination of the Contract by the Contractor.

ARTICLE 13. PAYMENTS TO CONTRACTORS

13.1 Application for Progress Payment:

13.1.1 The Contractor shall have the right to prepare and to submit to the Project Manager an application for progress payment once a month according to the schedule agreed upon in the preconstruction meeting. Such application shall request payment for the Work which has been satisfactorily completed by the Contractor (including materials furnished and incorporated into the construction) from the start of Work up to the last day of the month previously requested by the Contractor.

In unit price contracts, the Project Manager may prepare the progress payments. In a unit price Contract, the value of the Work completed shall be determined based upon the actual units completed and the unit prices submitted in the Bid.

In a lump sum Contract or for a lump sum item in a unit price Contract, the Work completed shall be based upon the schedule of values agreed upon prior to the start of the Work. If no schedule of values for a lump sum contract or item was agreed upon, the work completed shall be based upon a schedule of values prepared by the Project Manager.

The Contractor shall itemize, review or verify the Work completed in its application and shall support the application with such evidence of satisfactory completion as may be required by the City so that no question or dispute arises concerning the quality and acceptability of the Work.

13.1.2 The application for progress payment may also include application for the cost of certain non-perishable materials delivered to the Contractor but not yet incorporated in the Work, subject to the following conditions:

A. The type and amount of such materials shall be limited to those which are specially fabricated for the Project, or which are in short or critical supply; the estimated value of such stored materials shall be established and substantiated by itemized bills of sale, FOB storage site.

B. The Contractor shall have unencumbered title to these materials, substantiated by an itemized bill of sale in evidence of payment and cost.

C. Materials shall be suitably protected, stored and insured to the satisfaction of the Project Manager, and the City shall be fully indemnified against any loss or damage.

D. Stored materials shall be scheduled to be incorporated in the Work within 60 days following their inclusion in the application for payment.

E. Evidence of compliance with all the above conditions shall be submitted with the application for payment.

13.1.3 At the discretion of the City Engineer and subject to the above conditions, the City may authorize partial payment up to 90% of the documented material price for such stored materials.

13.1.4 The application for progress payment shall be made on approved forms, accompanied by a claim voucher furnished by the City.

13.2 Contractor's Warranty of Title:

13.2.1 The Contractor warrants and guarantees that title to all Work, materials and equipment covered by any application for payment, whether incorporated in the Project or not, will pass to the City at the time of payment free and clear of all liens, claims, security interests and encumbrances.

13.3 Review of Applications for Progress Payments:

13.3.1 The Project Manager will, within ten working days after receipt of each application for payment, either indicate in writing a recommendation of payment and present the application for review to the City Engineer, and any other funding source participating in the Contract or return the application to the Contractor indicating in writing the Project Manager's reasons for refusing requested payment. In the latter case, the Contractor may make the necessary corrections and resubmit the application. Payment on a Change Order cannot be applied for until the Change Order has been fully executed by the City.

Thirty (30) calendar days after receipt of an acceptable application for progress payment by the City Engineer from the Project Manager or from any reviewing funding source, the City will make a progress payment to the Contractor. Unless otherwise specified in the Contract Documents the progress payment will consist of the amount due and approved less, retainage, amounts previously paid, claims, liens, liquidated damages and judgments against the Contractor which have not been suitably discharged. Payment of the retainage will be deferred as provided in the Contract.

13.3.2 The Project Manager may refuse to recommend the whole or any part of any payment if, in the Project Manager's opinion, it becomes necessary to protect the City from loss because:

A. The Work is defective, or completed Work has been damaged requiring correction or replacement;

B. Written claims have been made against the City or liens have been filed in connection with the Work;

C. The City has been required to correct defective Work or complete Work in accordance with Section 11.8, "City May Correct Defective Work";

D. The Contract Price has been reduced because of modifications;

E. The Contractor's unsatisfactory execution of the Work in accordance with the Contract Documents;

F. The Contractor's failure to make payments to Subcontractors, or for labor, materials or equipment;

G. A reasonable doubt that the Work can be completed for the balance then unpaid;

H. Damage to another Contractor;

I. Liquidated damages.

If the above grounds are removed, payment shall be made for amounts withheld.

13.3.3 Without some showing of hardship acceptable to the City, no progress payment shall be made to a Contractor where the amount due the Contractor at the time of such a request is less than $1,000, nor shall more than one payment be made in any one (1) month.

13.4 Retainage:

13.4.1 The City will retain five (5) percent of each approved progress payment due the Contractor until the City Engineer certifies that the Work is Substantially Complete. At such time, the City Engineer will authorize release of the five (5) percent retainage less any assessed liquidated damages and a withheld sum as provided in Section 14.2 of these General Conditions.

ARTICLE 14. PROJECT CLOSEOUT

14.1 Request for Substantial Completion Inspection:

14.1.1 When the Contractor considers the entire Work ready for its intended use the Contractor shall, in writing to the Project Manager, certify that the entire Work is substantially complete and request that the Project Manager make an inspection and recommend issuance of a certificate of Substantial Completion. At such time the Contractor shall also submit its request for Final Payment to the Project Manager for review, approval and recommendation of payment.

14.2 Certificate of Substantial Completion:

14.2.1 If the Project Manager concurs that the Work is ready for inspection, the Project Manager will make such inspection, and if the Project Manager finds the value of any remaining work to be insubstantial, the Project Manager will make a recommendation to the City Engineer that a certificate of Substantial Completion and a Punch List be issued. At this time the Project Manager will also notify the Contractor that the Guarantee Bonds, a waiver of all future claims against the City, and a certification of payment of all labor, material and equipment used on the project must be submitted to the City Engineer. The Punch List will describe all incomplete or defective items of work which were found in the inspection.

14.2.2 When the Guarantee Bond, a waiver of all future claims and a certification of payment of all labor, material and equipment used on the project have been received by the City Engineer, the City Engineer will authorize payment of the contract balance, less any assessed liquidated damages, and less a withheld sum. The withheld sum shall be two (2) times the value of any remaining items found to require completion or correction as described in the Punch List and an additional amount sufficient to satisfy any current claims, liens or judgments against the Contractor, all as determined by the City Engineer. The value of the remaining items shall be determined to be what it would cost the City to complete the Work itself.

14.2.3 If the Contractor has not completed the Work specified on the Punch List within 60 days of receipt of the Punch List, it shall be declared in default by the City and liquidated damages will be assessed against the Contractor (see Article 10.).

14.3 Waiver of Claims:

14.3.1 The Contractor shall be required to submit prior to the issuance of final payment a waiver of all future claims against the City for any liability to the Contractor for anything done or furnished for or relating to or arising out of the Work and any prior act, neglect or default on the part of the City or any of its officers, agents or employees.

14.3.2 Should the Contractor refuse to accept payment of the contract balance less any withheld sum as tendered by the City Finance Director, it shall constitute a waiver of any right to interest thereon.

14.4 Final Completion/Final Payment:

14.4.1 Upon written notification by the Contractor and verification by the Project Manager that the remaining deficiencies of the Work have been remedied, and all claims, liens and judgements have been satisfied, the City Engineer will authorize payment of the withheld sum, which payment shall constitute the final payment. If no withheld sum has been deducted from the contract balance, payment of the contract balance shall constitute final payment.

14.4.2 The final payment will be made within 60 days following the date of its authorization by the City Engineer and approval by the Director of Finance.

14.5 Contractor's Continuing Obligation:

14.5.1 No payment, however final or otherwise, shall operate to release the Contractor of its Sureties from any of the obligations under these Contract Douments or of the Performance of Guarantee Bonds.

ARTICLE 15. AVAILABILITY OF FUNDS

15.1.1 The City shall be obligated to pay for goods and services received only to the extent that money has been appropriated and encumbered for such purpose. The Contractor in turn shall be obligated to perform only so long as money is available to pay for the goods and services it supplies. If this contract extends through one fiscal year of the City to the next year, the City's obligations hereunder shall be specifically limited to and shall be conditioned upon the appropriations for such following year.

15.1.2 This contract shall be deemed executory only to the extent of money available to the City for the performance of the terms hereof and no liability on account thereof shall be incurred by the City beyond monies available for the purpose thereof.

ARTICLE 16. LAW AND FORUM

16.1.1 The Contract shall be governed by and under the laws of the State of New York and the Charter of the City of Rochester. The parties further agree that the Supreme Court of the State of New York, held in and for the County of Monroe shall be the forum to resolve disputes arising out of either this Contract or work performed according thereto. The parties waive all other venue or forum selections. The parties may agree between themselves on alternative forums.

ARTICLE 17. NO WAIVER

17.1.1 In the event that the terms and conditions of this Contract or other City contracts are not strictly enforced by the City, such non-enforcement shall not act as or be deemed to act as a waiver or modification of the Contract, nor shall such non-enforcement prevent the City from enforcing each and every term of this Contract thereafter.

ARTICLE 18. SEVERABILITY

18.1.1 If any provision of this Contract is held invalid by a court of law, the remainder of this Contract shall not be affected thereby, if such remainder would then continue to conform to the laws of the State of New York.

SPECIFICATIONS

NEW YORK STATE STANDARD SPECIFICATIONS
SPECIFICATION LISTING

GENERAL

The following NYSDOT Standard items are acceptable for use as the City of Rochester Standard Specifications. The work shall conform to the requirements of the appropriate NYSDOT Section for these items:

ITEM NO.	ITEM	PAY UNIT
201.0601	Clearing and Grubbing	Lump Sum
202.20	Removing Old Bituminous Concrete Overlay	Square Yard
203.01	Unclassified Excavation and Embankment	Cubic Yard
203.02	Unclassified Excavation and Disposal	Cubic Yard
203.03	Embankment in Place	Cubic Yard
203.07	Select Granular Fill	Cubic Yard
203.20	Select Granular Subgrade	CubicYard
203.21	Select Structure Fill	Cubic Yard
207.01	Geotextile Bedding	Square Yard
207.02	Geotextile Undercut	Square Yard
207.03	Geotextile Underdrain	Square Yard
207.04	Geotextile Slope Protection	Square Yard
302.01	Bituminous Stabalized Course	Cubic Yard
303.01	Optional Flexible Shoulder	Square Yard
304.02	Subbase Course, Type 1	Cubic Yard
304.03	Subbase Course, Type 2	Cubic Yard
308.01	Soil Cement Course	Cubic Yard
403.11	Asphalt Concrete-Type 1 Base Course	Ton
403.13	Asphalt Concrete-Type 3 Binder Course	Ton
403.1901	Asphalt Concrete-Type 7F Top Course (High Friction) Marshall Design	Ton
403.21	Asphalt Concrete-Truing and Leveling Course	Ton
502.04	Cement Concrete Pavement, Reinforced, Class C	Cubic Yard
502.05	Cement Concrete Pavement, Reinforced, Class F	Cubic Yard
502.06	Cement Concrete Pavement, Unreinforced, Class C	Cubic Yard
502.10	Metal Reinforcement for Concrete Pavement (10' wide or greater)	Square Yard
502.11	Metal Reinforcement for Concrete Pavement (less than 10' wide)	Square Yard
502.20	Transverse Joint Supports (all types)	Linear Foot
502.30	Longitudinal Joint Ties	Each
502.32	Longitudinal Joint Ties (Grout type)	Each
502.33	Longitudinal Joint Ties (Curbing)	Each
502.42	Constructing and Sealing Transverse Expansion Joints	Linear Foot
502.43	Constructing and Sealing Special Joints	Linear Foot

ITEM NO.	ITEM	PAY UNIT
503.0101	Cement Concrete Foundation for Pavement, Unreinforced, Class C	Cubic Yard
503.02	Cement Concrete Foundation for Pavement, Unreinforced, Class F	Cubic Yard
552.01	Permanent Timber Sheet Piling	Square Foot
552.02	Permanent Steel Sheet Piling	Square Foot
552.03	Temporary Timber Sheet Piling	Square Foot
552.04	Temporary Steel Sheet Piling	Square Foot
552.05	Safe Operation Sheet Piling	Square Foot
552.06nnnn	Cofferdams	Each
552.07	Cofferdams (Water Discharge Control)	Each
555.0101	Concrete for Structures, Class A (Mass Placements)	Cubic Yard
555.0103	Concrete for Structures, Class A (Appurtenant Placements)	Cubic Yard
555.05	Concrete for Structures, Class F	Cubic Yard
556.0101	Uncoated Steel Fabric Reinforcement for Structures	Square Foot
556.0102	Epoxy Coated Steel Fabric Reinforcement	Square Foot
556.0201	Uncoated Bar Reinforcement for Concrete Structures	Pound
556.0202	Epoxy-Coated Bar Reinforcement for Structures	Pound
560.01	Dimension Stone Masonry	Square Foot
560.02	Split Faced Concrete Masonry	Square Foot
560.03	Stone Masonry - Type A	Cubic Yard
560.04	Stone Masonry - Type B	Square Foot
560.05	Rubble Stone Masonry	Cubic Yard
560.06	Rubble Stone Masonry Laid Dry	Cubic Yard
560.07	Precast Concrete Coping	Linear Foot
583.01	Shotcrete	Bag
606.10	Box Beam Guide Railing	Linear Foot
606.11	Box Beam Guide Railing (Shop Curved)	Linear Foot
606.14	Box Beam Guide Railing End Assembly	Each
606.20	Corrugated Beam Guide Railing	Linear Foot
606.2001	Corrugated Beam Guide Railing (Shop Curved)	Linear Foot
606.22	Anchorage Units for Corrugated Beam Guide Railing	Each
606.50	Resetting Corrugated Beam Guide Railing	Linear Foot
606.52	Resetting Box Beam Guide Railing	Linear Foot
606.54	Resetting Corrugated Beam Guide Railing (New Posts)	Linear Foot
606.57	Resetting Anchorage Units for Corrugated Beam Guide Railing or Mall Barrier	Each
606.58	Resetting Box Beam Guide Railing End Assembly	Each
606.62	Removing and Storing Corrugated Beam Guide Railing	Linear Foot
606.64	Removing and Storing Box Beam Guide Railing	Linear Foot

ITEM NO.	ITEM	PAY UNIT
606.67	Removing and Storing Anchorage Units for Corrugated Beam Guide Railing and Mall Barriers	Each
606.68	Removing and Storing Box Beam Guide Railing End Assembly	Each
606.71	Removing and Disposing Cable Guide Railing	Linear Foot
606.72	Removing and Disposing Corrugated Beam Guide Railing	Linear Foot
606.74	Removing and Disposing Box Beam Guide Railing	Linear Foot
606.76	Removing and Disposing Anchorage Units for Cable Guide Railing	Each
606.77	Removing and Disposing Anchorage Units for Corrugated Beam Guide Railing and Mall Barrier	Each
606.78	Removing and Disposing Box Beam Guide Railing End Assembly	Each
606.91	Resetting Box Beam Guide Railing (New Posts)	Linear Foot
612.01	Sodding	Square Yard
612.0201	Furnishing and Placing Jute Mesh or Other Approved Erosion Control Materials	Square Yard
613.0101	Topsoil	Cubic Yard
618.3101	Asphalt Emulsion (RS-2)	Gallon
619.02	Construction Signs	Lump Sum
619.0413	Type III Construction Barricades	Linear Foot
619.0502	Lighting for Construction Barricades	Linear Foot
619.13	Temporary Traffic Signals	Lump Sum
633.0202	Cleaning Existing Pavement and/or Shoulders	Square Yard
633.05	Cleaning, Sealing and Filling Joints and Cracks	Lump Sum
634.01	Survey and Stakeout	Lump Sum
634.02	Portland Cement	Barrel
635.0102	Cleaning and Preparation of Pavement Surface Lines	Linear Foot
635.0202	Cleaning and Preparation of Pavement Letters	Each
635.0302	Cleaning and Preparation of Pavement Symbols	Each
637.05	Engineer's Office - Type A	Month
645.40	Special Signs and Devices	Each
647.04	Removal and Storage of Signs - Size A (0 to 10 SF)	Each
647.05	Removal and Storage of Signs - Size B (11 to 20 SF)	Each
647.06	Removal and Storage of Signs - Size C (21 to 40 SF)	Each
647.07	Removal and Storage of Signs - Size D (41 to 100 SF)	Each
647.08	Removal and Storage of Signs - Size E (over 100 SF)	Each
680.5001	Pole Excavation and Concrete Foundation	Cubic Yard

ITEM NO.	ITEM	PAY UNIT
680.5002	Concrete Base for Controller Cabinet	Each
680.52XXXX	Conduit - Metal Steel Zinc-Coated X" Diameter	Linear Foot
680.53	Conduit Jacking or Boring	Linear Foot
680.7001	Single Span Wire Assembly	Each
680.7002	Dual Span Wire Assembly with Upper Tether Wire	Each
680.7003	Dual Span Wire Assembly with Lower Tether Wire	Each
680.7004	Messenger Assembly	Linear Foot
680.7005	Guy Assembly	Each
680.7006XX	Riser Assembly - X" Diameter	Each
680.73XXXX	Signal Cable - XX Conductor XX AWG	Linear Foot
680.75XXXX	Shielded Communication Cable - XX Pair XX AWG	Linear Foot
680.8101	Traffic Signal Section - 12"	Each
680.8102	Traffic Signal Section Optically Programmed - 12"	Each
680.8103	Traffic Signal Section - 8"	Each
680.8111	Traffic Signal Bracket Assembly - 1 way	Each
680.8112	Traffic Signal Bracket Assembly - 2 way	Each
680.8113	Traffic Signal Bracket Assembly - 3 way	Each
680.8114	Traffic Signal Bracket Assembly - 4 way	Each
680.8115	Traffic Signal Bracket Assembly - 5 way	Each
680.8120	Traffic Signal Disconnect Hanger	Each
680.8131	Pedestrian Signal Section - 4-1/2" Letters	Each
680.8132	Pedestrian Signal Section - 3" Letters	Each
680.8141	Pedestrian Signal Bracket Mount Assembly	Each
680.8142	Pedestrian Signal Post Top Mount Assembly	Each
680.82XX	Overhead Sign Assembly - Type XX	Each
680.8220	Flashing Beacon Sign Assembly	Each
680.8230	Fire Pre-Emption Tell Tale Light	Each
699.04	Mobilization	Lump Sum

CITY OF ROCHESTER STANDARD SPECIFICATIONS
SPECIFICATION LISTING

ITEM NO.	ITEM	PAY UNIT
SECTION R200 EARTHWORK		
R203.22	Rock Excavation and Disposal	CY
R203.23	Select Granular Backfill (Pipe)	CY
R203.24	Select Granular Backfill (PVCP Pipe)	CY
R203.25	Stone Bedding	CY
R203.26	Sand	CY
R204.01	Milling - Variable Depth	SY
R204.02	Milling - 2" Thickness	SY
R204.03	Milling - 3" Thickness	SY
R204.04	Milling - 4" and over Thickness	SY
R205.01	Concrete Base Repair	SY
R205.02	Asphalt Base Repair - Commercial	SY
R205.03	Asphalt Base Repair - Residential	SY
R206.04	Trench and Culvert Excavation	CY
R206.05	Trench and Culvert Rock Excavation	CY
R206.06	Conduit Excavation and Backfill	LF
R206.07	Excavation for Test Pits	CY
R206.08	Rock Excavation for Test Pits	CY
R207.05	Polyester Fiber Fabric Reinforcement	SF
SECTION R400 BITUMINOUS PAVEMENTS		
R404.01	Recycled Asphalt Base Course	TON
R404.02	Recycled Asphalt Binder Course	TON
R404.03	Recycled Asphalt Top Course	TON
R404.04	Recycled Asphalt Concrete - Truing and Leveling Course	TON
R406.01	Pavement Key	LF
R407.02	Tack Coat	SY
R407.03	Tack Coat	GAL
R408.01	Seal Coat	SY
R412.01	Temporary Pavement	SF
R412.02	Temporary Pavement with Subbase	SF
R412.03	Temporary Pavement - Asphalt Milling Pavement	SF
R412.04	Temporary Pavement - Asphalt Milling Pavement with Subbase	SF
SECTION R500 RIGID PAVEMENTS		
R504.01	Class K Concrete	CY
R504.02	Class L Concrete	CY
R505.01	Restore Existing Brick Pavement	SF

ITEM NO.	ITEM	PAY UNIT
R505.02	New Pavers for Brick Pavement	SF
SECTION R550 STRUCTURES		
R590.01	Window Well	EA
R591.01XX	X' x X' Sidewalk Hatch (Street Address)	EA
R592.01XX	Areaway Abandonment (Street Address)	LS
R593.01XX	Excavation Over Existing Areaway Roof (Street Address)	LS
SECTION R600 INCIDENTAL CONSTRUCTION		
R601.01XX	X" Extra-Strength Vitrified Clay Pipe	LF
R601.02XX	X" Polyvinyl Chloride Pipe, SDR21	LF
R601.03XX	X" Extra-Heavy Cast Iron Soil Pipe	LF
R601.04XX	X" Extra-Strength Vitrified Clay Riser Pipe	LF
R601.05XX	X" Polyvinyl Chloride Riser Pipe, SDR 21	LF
R601.06XX	X" Extra-Heavy Cast Iron Soil Riser Pipe	LF
R601.07	Lateral Connection to Existing Catch Basin	EA
R601.08	Lateral Connection to Existing Lateral	EA
R601.09	Lateral Connection to Existing Stone Box Sewer	EA
R601.10	Lateral Connection to Existing Brick Sewer	EA
R601.11	Lateral Connection to Existing Manhole Opening	EA
R601.12	Lateral Connection to Existing Manhole	EA
R601.13	Lateral Connection to Existing Manhole, Including Outside Drop Connection	EA
R601.14XX	X" x X" Extra-Strength Vitrified Clay Branch at Existing Sewer	EA
R601.15XX	X" x X" Polyvinyl Chloride Branch at Existing Sewer	EA
R601.16XX	X" x X" Extra-Heavy Cast Iron Branch at Existing Sewer	EA
R601.17XX	X" x X" x X" Extra-Strength Vitrified Clay Double-Branch at Existing Sewer	EA
R601.18XX	X" x X" x X" Polyvinyl Chloride Double-Branch at Existing Sewer	EA
R601.19XX	X" Extra-Strength Vitrified Clay Saddle Branch	EA
R601.20XX	X" Polyvinyl Chloride Saddle Branch	EA
R601.21XX	X" Extra-Heavy Cast Iron Saddle Branch	EA
R604.11	Type A Catch Basin	EA
R604.12	Type B Catch Basin	EA
R604.13	Type C Catch Basin	EA
R604.14	Additional Depth Type A Catch Basin	LF
R604.15	Additional Depth Type B Catch Basin	LF
R604.16	Additional Depth Type C Catch Basin	LF
R604.17	Adjust Existing Catch Basin Frame and Grate	EA
R604.18	Adjust Existing Capstone Catch Basin Frame and Grate	EA
R604.19	Relocate Existing Catch Basin	EA

ITEM NO.	ITEM	PAY UNIT
R604.20	Clean Existing Catch Basin and Lateral	EA
R604.21	Adjust Existing Manhole Frame and Cover	EA
R605.12	6" Corrugated Polyethylene Underdrain Pipe	LF
R605.13	Underdrain Filter Material	CY
R607.21	4' Chain Link Fence	LF
R607.22	6' Chain Link Fence	LF
R607.23	8' Chain Link Fence	LF
R607.24	4' Chain Link Fence w/P.D.S. Slats	LF
R607.25	6' Chain Link Fence w/P.D.S. Slats	LF
R607.26	8' Chain Link Fence w/P.D.S. Slats	LF
R607.27	Relocate Existing Chain Link Fence	LF
R607.28	Relocate Existing Wood Fence	LF
R607.29	Relocate Existing Wire Fence	LF
R607.30	4' Stockade Fence	LF
R607.31	6' Stockade Fence	LF
R608.12	Concrete Sidewalk and Driveway	CY
R608.13	Concrete Sidewalk and Driveway (Including Excavation)	CY
R608.14	Concrete Sidewalk and Driveway (Including Excavation and Gravel)	CY
R608.15	Asphalt Driveway - Light Duty	SF
R608.16	Asphalt Driveway - Medium Duty	SF
R608.17	Asphalt Driveway Overlay	TON
R608.18	Brick Sidewalk and Driveway	SF
R608.19	Reset Existing Brick Pavers	SF
R608.20	Reset Existing Stone Sidewalk - Light Duty	SF
R608.21	Reset Existing Stone Sidewalk - Heavy Duty	SF
R608.22	Salvage Existing Stone Sidewalk	SF
R609.21	4" Stone Curb	LF
R609.22	4" Radius Stone Curb	LF
R609.23	5" Stone Curb	LF
R609.24	5" Radius Stone Curb	LF
R609.25	5" Mountable Stone Curb	LF
R609.26	5" Mountable Radius Stone Curb	LF
R609.27	Reset Existing Stone Curb	LF
R609.28	4" Stone Curb - Curb Replacement	LF
R609.29	4" Radius Stone Curb - Curb Replacement	LF
R609.30	5" Stone Curb - Curb Replacement	LF
R609.31	5" Radius Stone Curb - Curb Replacement	LF
R609.32	5" Mountable Stone Curb - Curb Replacement	LF
R609.33	5" Mountable Radius Stone Curb - Curb Replacement	LF
R609.34	Reset Existing Stone Curb - Curb Replacement	LF

ITEM NO.	ITEM	PAY UNIT
R609.35	Salvage Existing Stone Curb	LF
R609.36	Concrete Curb	LF
R609.37	Precast Concrete Curb	LF
R609.38	Concrete Curb - Curb Replacement	LF
R610.05	Hydroseeding	SF
R610.06	Seeding	SF
R610.07	Shredded Bark Mulch	CY
R610.08	Pea Gravel	CY
R611.10XX	Deciduous Tree - botanical name - common name	EA
R611.1001	Deciduous Tree - Fraxinus americana "Autumn Purple" - Autumn Purple Ash	EA
R611.1002	Deciduous Tree - Fraxinus pennsylvanica "Marshall's Seedless" - Marshall's Seedless Green Ash	EA
R611.1003	Deciduous Tree - Fraxinus americana "Rose Hill" - Rose Hill White Ash	EA
R611.1004	Deciduous Tree - Fraxinus pennsylvanica "Summit" - Summit Green Ash	EA
R611.1005	Deciduous Tree - Prunus serrulata "Kwanzan" - Kwanzan Cherry	EA
R611.1006	Deciduous Tree - Prunus "Sargentii" - Sargent Cherry	EA
R611.1007	Deciduous Tree - Phellodendron amurense - Amur Cork Tree	EA
R611.1008	Deciduous Tree - Malus "Centurion" -Centurion Crabapple	EA
R611.1009	Deciduous Tree - Malus "Hopa" - Hopa Crabapple	EA
R611.1010	Deciduous Tree - Malus "Radiant" - Radiant Crabapple	EA
R611.1011	Deciduous Tree - Malus "Red Baron" - Red Baron Crabapple	EA
R611.1012	Deciduous Tree - Malus "Royalty" - Royalty Crabapple	EA
R611.1013	Deciduous Tree - Malus "Snowdrift" - Snowdrift Crabapple	EA
R611.1014	Deciduous Tree - Corylus colurna - Turkish Filbert	EA
R611.1015	Deciduous Tree - Ginkgo biloba "Autumn Gold" - Autumn Gold Ginkgo	EA
R611.1016	Deciduous Tree - Ginkgo biloba "Sentry" - Sentry Ginkgo	EA
R611.1017	Deciduous Tree - Celtis occidentalis - Common Hackberry	EA
R611.1018	Deciduous Tree - Crataegus "Lavalle" -Lavalle Hawthorn	EA
R611.1019	Deciduous Tree - Crataegus phaenopyrum - Washington Hawthorn	EA
R611.1020	Deciduous Tree - Gleditsia triacanthos inermis "Shademaster" - Shademaster Honeylocust	EA
R611.1021	Deciduous Tree - Gleditsia triacanthos inermis "Skyline" - Skyline Honeylocust	EA
R611.1022	Deciduous Tree - Carpinus betula "Fastigiata" - Pyramidal European Hornbeam	EA

ITEM NO.	ITEM	PAY UNIT
R611.1023	Deciduous Tree - Tilia cordata "Chancellor" - Chancellor Little-Leaf Linden	EA
R611.1024	Deciduous Tree - Tilia euchlora - Crimean Linden	EA
R611.1025	Deciduous Tree - Tilia cordata "DeGroot" - DeGroot Linden	EA
R611.1026	Deciduous Tree - Tilia cordata "Glenleven" - Glenleven Linden	EA
R611.1027	Deciduous Tree - Tilia cordata "Greenspire" - Greenspire Linden	EA
R611.1028	Deciduous Tree - Tilia tomentosa "Sterling Silver" - Silver Linden	EA
R611.1029	Deciduous Tree - Gleditsia triacanthos inermis "Imperial" - Imperial Locust	EA
R611.1030	Deciduous Tree - Acer rubrum "Armstrong" - Armstrong Red Maple	EA
R611.1031	Deciduous Tree - Acer platanoides "Cleveland" - Cleveland Norway Maple	EA
R611.1032	Deciduous Tree - Acer platanoides "Columnare" - Columnar Norway Maple	EA
R611.1033	Deciduous Tree - Acer platanoides "Crimson King" - Crimson King Norway Maple	EA
R611.1034	Deciduous Tree - Acer platanoides "Emerald Queen" - Emerald Queen Norway Maple	EA
R611.1035	Deciduous Tree - Acer saccharum "Green Mountain" - Green Mountain Sugar Maple	EA
R611.1036	Deciduous Tree - Acer campestre - Hedge Maple	EA
R611.1037	Deciduous Tree - Acer rubrum "Karpick" - Karpick Red Maple	EA
R611.1038	Deciduous Tree - Acer rubrum "October Glory" - October Glory Red Maple	EA
R611.1039	Deciduous Tree - Acer platanoides "Summershade" - Summershade Norway Maple	EA
R611.1040	Deciduous Tree - Quercus rubra - Northern Red Oak	EA
R611.1041	Deciduous Tree - Pyrus calleryana "Aristocrat" - Aristocrat Pear	EA
R611.1042	Deciduous Tree - Pyrus calleryana "Bradford" - Bradford Pear	EA
R611.1043	Deciduous Tree - Pyrus calleryana "Redspire" - Redspire Pear	EA
R611.1044	Deciduous Tree - Pyrus calleryana "White House" - White House Pear	EA
R611.1045	Deciduous Tree - Platanus x. acerifolia "Bloodgood" - Bloodgood London Plane	EA
R611.1046	Deciduous Tree - Eucommia ulmoides - Hardy Rubber Tree	EA
R611.1047	Deciduous Tree - Sophora japonica - Regent Scholar	EA

ITEM NO.	ITEM	PAY UNIT
R611.1048	Deciduous Tree - Amelanchier x. "Robin Hill" - Robin Hill Serviceberry	EA
R611.1049	Deciduous Tree - Amelanchier canadensis - Shadblow Serviceberry	EA
R611.1050	Deciduous Tree - Amelanchier - Springtyme Serviceberry	EA
R611.1051	Deciduous Tree - Zelkova serrata "Green Vase" - Green Vase Zelkova	EA
R611.1052	Deciduous Tree - Zelkova serrata "Village Green" - Village Green Zelkova	EA
R611.1053	Deciduous Tree - Malus "Donald Wyman" - Donald Wyman	EA
R611.1054	Deciduous Tree - Cercidiphyllum japonicum - Katsura Tree	EA
R611.1055	Deciduous Tree - Malus sutyzam - Sugartyme	EA
R611.20XX	Evergreen Tree - botanical name - common name	EA
R611.2001	Evergreen Tree - Pseudotsuga taxifolia - Douglas Fir	EA
R611.2002	Evergreen Tree - Pseudotsuga taxifolia - White Fir	EA
R611.2003	Evergreen Tree - Tsuga canadensis - Canadian Hemlock	EA
R611.2004	Evergreen Tree - Pinus nigra - Austrian Pine	EA
R611.2005	Evergreen Tree - Pinus sylvestris - Scotch Pine	EA
R611.2006	Evergreen Tree - Pinus strobus - White Pine	EA
R611.2007	Evergreen Tree - Picea glauca denoata - Black Hills Spruce	EA
R611.2008	Evergreen Tree - Picea pungeus - Colorado Spruce	EA
R611.2009	Evergreen Tree - Picea abies - Norway Spruce	EA
R611.2010	Evergreen Tree - Picea glauca - White Spruce	EA
R611.30XX	Deciduous Shrub - botanical name - common name	EA
R611.3001	Deciduous Shrub - Myrica pennsylvanica - Northern Bayberry	EA
R611.3002	Deciduous Shrub - Euonymus alata "Compacta" - Dwarf Burningbush	EA
R611.3003	Deciduous Shrub - Aronia melanocarpa - Black Chokeberry	EA
R611.3004	Deciduous Shrub - Cotoneaster apiculatus - Cranberry Cotoneaster	EA
R611.3005	Deciduous Shrub - Cotoneaster divaricatus - Spreading Cotoneaster	EA
R611.3006	Deciduous Shrub - Viburnum trilobum - American Cranberrybush	EA
R611.3007	Deciduous Shrub - Viburnum opulus - European Cranberrybush	EA
R611.3008	Deciduous Shrub - Forsythia suspensa - Weeping Forsythia	EA
R611.3009	Deciduous Shrub - Lonicera xylosteum "Hedge King" - Hedge King Honeysuckle	EA
R611.3010	Deciduous Shrub - Elaeagnus umbellata - Autumn Olive	EA

ITEM NO.	ITEM	PAY UNIT
R611.3011	Deciduous Shrub - Elaeagnus angustifolia - Russian Olive	EA
R611.3012	Deciduous Shrub - Ligustrum amurense - Amur Privet	EA
R611.3013	Deciduous Shrub - Ligustrum obtusifolium regelianum - Regal Border Privet	EA
R611.3014	Deciduous Shrub - Berberis spp - Barberry SPP	EA
R611.3015	Deciduous Shrub - Syringa spp - Lilac SPP	EA
R611.3016	Deciduous Shrub - Philadelphus spp - Mock-orange SPP	EA
R611.3017	Deciduous Shrub - Chaenomeles spp - Quince SPP	EA
R611.3018	Deciduous Shrub - Weigela spp - Weigela SPP	EA
R611.3019	Deciduous Shrub - Rhus aromatica - Fragrant Sumac	EA
R611.3020	Deciduous Shrub - Rhamnus frangula columnaris - Columnar Tallhedge	EA
R611.3021	Deciduous Shrub - Viburnum dentatum - Arrowwood Viburnum	EA
R611.3022	Deciduous Shrub - Viburnum prunifolium - Blackhaw Viburnum	EA
R611.3023	Deciduous Shrub - Viburnum plicatum tomentosum - Doublefile Viburnum	EA
R611.40XX	Evergreen Shrub - botanical name - common name	EA
R611.4001	Evergreen Shrub - Arborvitae occidentalis "Nigra" - Darkgreen Arborvitae	EA
R611.4002	Evergreen Shrub - Arborvitae occidentalis "Techny" - Mission Arborvitae	EA
R611.4003	Evergreen Shrub - Euonymus fortunei "Greenlane" - Greenlane Euonymus	EA
R611.4004	Evergreen Shrub - Ilex crenata - Japanese Holly	EA
R611.4005	Evergreen Shrub - Juniperus sabina "Blue Danube" - Blue Danube Juniper	EA
R611.4006	Evergreen Shrub - Juniperus horizontalis "Wiltonii" - Blue Rug Juniper	EA
R611.4007	Evergreen Shrub - Juniperus chinensis sargentii "Glauca" - Blue Sargent Juniper	EA
R611.4008	Evergreen Shrub - Juniperus chinensis "Glauca Hetzi" - Hetz Blue Juniper	EA
R611.4009	Evergreen Shrub - Juniperus chinensis "Pfitzeriana" - Pfitzer Juniper	EA
R611.4010	Evergreen Shrub - Pinus mugo - Mugo Pine	EA
R611.4011	Evergreen Shrub - Taxus cuspidata capitata - Capitata Yew	EA
R611.4012	Evergreen Shrub - Taxus cuspidata mana - Compact Japanese Yew	EA
R611.4013	Evergreen Shrub - Taxus media "Hicksii" - Hicks Yew	EA
R611.50XX	Vines and Ground Cover - botanical name - common name	EA
R611.5001	Vines and Ground Cover - Arctostaphylos uva-ursi - Bearberry	EA
R611.5002	Vines and Ground Cover - Coronilla varia - Crownvetch	EA

ITEM NO.	ITEM	PAY UNIT
R611.5003	Vines and Ground Cover - Lonicera japonica "Halliana" - Hall's Honeysuckle	EA
R611.5004	Vines and Ground Cover - Hedera helix baltica - Baltic Ivy	EA
R611.5005	Vines and Ground Cover - Hedera helix - English Ivy	EA
R611.5006	Vines and Ground Cover - Vinca minor - Myrtle	EA
R611.5007	Vines and Ground Cover - Pachysandra terminalis - Pachysandra	EA
R611.5008	Vines and Ground Cover - Vinca minor - Periwinkle	EA
R611.5009	Vines and Ground Cover - Euonymus fortunei "Colorata" - Purpleleaf Wintercreeper	EA
R614.04	Prune Existing Tree	EA
R614.05	Tree Removal - 6" up to 12" DBH	EA
R614.06	Tree Removal - 12" up to 18" DBH	EA
R614.07	Tree Removal - 18" up to 24" DBH	EA
R614.08	Tree Removal - 24" up to 30" DBH	EA
R614.09	Tree Removal - 30" up to 36" DBH	EA
R614.10	Tree Removal - 36" up to 42" DBH	EA
R614.11	Tree Removal - 42" up to 48" DBH	EA
R614.12	Tree Removal - 48" and over DBH	EA
R614.13	Tree Relocation - 1" up to 4" DBH	EA
R614.14	Tree Relocation - 4" up to 8" DBH	EA
R614.15	Prune Existing Plant	EA
R614.16	Plant Removal	EA
R614.17	Plant Relocation	EA
R614.18	Stump Removal - 6" up to 12" Diameter	EA
R614.19	Stump Removal - 12" up to 24" Diameter	EA
R614.20	Stump Removal - 24" up to 36" Diameter	EA
R614.21	Stump Removal - 36" up to 48" Diameter	EA
R614.22	Stump Removal - 48" Diameter and over	EA
R615.05	4" Bollard	EA
R615.06	6" Bollard	EA
R615.07	Pipe Bumper Rail	LF
R615.08	Reset Existing Pipe Bumper Rail	LF
R615.09	Ryerson Edging	LF
R615.10	Timber Curb	LF
R615.11	6" x 6" Timber Bollard	EA
R615.12	8" x 8" Timber Bollard	EA
R615.13	3/8" Galvanized Linked Chain	LF
R615.14	1/2" Galvanized Cable	LF
R615.15	Bench	EA
R615.16	Park Bench	EA
R615.17	Classic Victorian Bench	EA

ITEM NO.	ITEM	PAY UNIT
R616.01	Stone Tree Planter	SF
R616.02	Brick Tree Planter	SF
R616.03XX	X' x X' Frame and Grate Tree Planter	EA
R616.04XX	X' x X' Grate Tree Planter	EA
R616.05	Reset Existing Stone Tree Planter	SF
R616.06	Reset Existing Brick Tree Planter	SF
R616.07	Reset Existing Frame and Grate Tree Planter	EA
R616.08	Reset Existing Grate Tree Planter	EA
R619.01	Basic Maintenance and Protection of Traffic	LS
R622.01	2" Saw Cut - Asphalt	LF
R622.02	2" Saw Cut - Concrete	LF
R622.03	Full Depth Pavement Saw Cut	LF
R624.05	Concrete Gutter	LF
R624.06	Precast Concrete Gutter	LF
R624.07	Concrete Gutter - Gutter Replacement	LF
R626.02	Horizontal Control Survey Monument	EA
R626.03	Vertical Control Survey Monument	EA
R626.04	Adjust Existing Survey Monument	EA
R626.05	Remove Existing Survey Monument	EA
R626.06	New Frame and Cover	EA
R626.07	Reset Existing Frame and Cover	EA
R626.08	Brass Survey Marker Installation	EA
R642.01XX	X" White Paint Pavement Stripe	LF
R642.02XX	X" Yellow Paint Pavement Stripe	LF
R642.03	White Paint Pavement Letter	EA
R642.04	Yellow Paint Pavement Letter	EA
R642.05	White Paint Pavement Symbol	EA
R642.06	Yellow Paint Pavement Symbol	EA
R643.01	Parking Meter Post - Sidewalk Area	EA
R643.02	Parking Meter Post - over Structure	EA
R643.03	Parking Meter Post - Lawn Area	EA
R643.04	Sign Post Sleeve	EA
R653.01	Fire Alarm Base	EA
R653.02	Reset Existing Fire Alarm Pole	EA
R655.03	Manhole Frame and Cover - Casting	EA
R655.04	Type A Catch Basin Frame and Grate - Casting	EA
R655.05	Type B Catch Basin Frame and Grate - Casting	EA
R655.06	Type A Catch Basin Frame and Grate - Fabricated	EA
R655.07	Type B Catch Basin Frame and Grate - Fabricated	EA
R671.01	Cable	LF
R671.02	3" PVC Conduit	LF

ITEM NO.	ITEM	PAY UNIT
R671.03	3" PVC Conduit - in Roadway	LF
R671.04	3" Galvanized Steel Conduit - in Roadway	LF
R671.05	Replace Existing Conduit w/ 3" Galvanized Steel Conduit - in Roadway	LF
R671.06	2" PVC Conduit	LF
R671.07	2" PVC Conduit - in Roadway	LF
R671.08	2" Galvanized Steel Conduit - in Roadway	LF
R671.09	Replace Existing Conduit w/ 2" Galvanized Steel Conduit - in Roadway	LF
R671.10	Concrete Pullbox (24")	EA
R671.11	Concrete Pullbox (30")	EA
R671.12	Adjust Existing Concrete Pullbox	EA
R671.13	Relocate Existing Concrete Pullbox	EA
R671.14	Fiberglass Pullbox/Handhole	EA
R671.15	Adjust Existing Fiberglass Pullbox/Handhole	EA
R671.16	Relocate Existing Fiberglass Pullbox/Handhole	EA
R671.17	Metal Pole Base Foundation	EA
R671.18	Metal Pole Base Foundation Extension Adjustment	EA
R671.19	Metal Pole Base Foundation Adjustment	EA
R671.20	Fiberglass Pole Base Foundation	EA
R671.21	Fiberglass Pole Base Foundation Extension Adjustment	EA
R671.22	Fiberglass Pole Base Foundation Adjustment	EA
R671.23	Davit Pole - 20'	EA
R671.24	Davit Pole - 25'	EA
R671.25	Davit Pole - 30'	EA
R671.26	Davit Pole - 35'	EA
R671.27	Davit Pole - 20' Twin	EA
R671.28	Davit Pole - 25' Twin	EA
R671.29	Davit Pole - 30' Twin	EA
R671.30	Davit Pole - 35' Twin	EA
R671.31	Fiberglass Light Pole	EA
R671.32	Luminaire Installation for Fiberglass Pole	EA
R671.33	Luminaire Installation for Metal Pole	EA
R671.34	Relocate Existing Metal Light Pole - Cast-in-Place Base	EA
R671.35	Relocate Existing Fiberglass Light Pole - Cast-in-Place Base	EA
R671.36	Relocate Existing Metal Light Pole - Precast Base	EA
R671.37	Relocate Existing Fiberglass Light Pole - Precast Base	EA
R671.38	Connection to RG&E Wood Pole	EA
R671.39	Remove Existing Metal Light Pole and Base	EA
R671.40	Remove Existing Fiberglass Light Pole and Base	EA
R685.01XX	X" White Inlaid Plastic Pavement Marking Stripe	LF
R685.02XX	X" Yellow Inlaid Plastic Pavement Marking Stripe	LF

ITEM NO.	ITEM	PAY UNIT
R685.03	White Inlaid Plastic Pavement Marking Letter	EA
R685.04	White Inlaid Plastic Pavement Marking Symbol	EA
R685.05XX	X" White Overlaid Plastic Pavement Marking Stripe	LF
R685.06XX	X" Yellow Overlaid Plastic Pavement Marking Stripe	LF
R685.07	White Overlaid Plastic Pavement Marking Letter	EA
R685.08	White Overlaid Plastic Pavement Marking Symbol	EA
R687.05XX	X" White Alkyd Thermoplastic Pavement Marking Stripe	LF
R687.06XX	X" Yellow Alkyd Thermoplastic Pavement Marking Stripe	LF
R687.07	White Alkyd Thermoplastic Pavement Marking Letter	EA
R687.08	White Alkyd Thermoplastic Pavement Marking Symbol	EA

SECTION R900 WATER FACILITIES

R901.01XX	X" Ductile Iron Pipe Water Main Class 52	LF
R901.02XX	X" Ductile Iron Pipe Water Main Class 52 (Anchor Pipe)	LF
R901.03XX	X" Ductile Iron Pipe Water Main Class 56	LF
R901.04XX	X" Ductile Iron Pipe Water Main Class 52 (Including Polyethylene Encasement)	LF
R901.05XX	X" Ductile Iron Pipe Water Main Class 52 (Anchor Pipe, Including Polyethylene Encasement)	LF
R901.06XX	X" Ductile Iron Pipe Water Main Class 56 (Including Polyethylene Encasement)	LF
R901.07	Additional Ductile Iron Pipe Fittings	LB
R902.01XX	X" Gate Valve w/ Valve Box - Vertical Type	EA
R902.02XX	X" Gate Valve w/ Valve Box - Horizontal Type	EA
R902.03XX	Salvage Existing X" Valve	EA
R904.01XX	X" x X" Tapping Sleeve and Valve w/ Valve Box	EA
R904.02XX	X" x X" Tapping Saddle and Valve w/ Valve Box	EA
R905.01XX	X" Cutting-In Valve w/ Valve Box and Sleeve(s)	EA
R906.01XX	X" Insertion Sleeve	EA
R907.01	Connect New Water Main to Existing Water Main	EA
R908.01XX	Cut and Plug Existing X" Water Main	EA
R909.01	Furnish and Install New Valve Box	EA
R909.02	Furnish and Install New Valve Box (Including Excavation and Backfill)	EA
R909.03	Furnish and Install New Valve Box (Including Excavation, Backfill and Surface Restoration)	EA
R909.04	Remove Existing Valve Box	EA
R909.05	Remove Existing Valve Box (Including Excavation and Backfill)	EA
R909.06	Remove Existing Valve Box (Including Excavation, Backfill and Surface Restoration)	EA
R909.07	Adjust Valve Box to Grade - Extension Adjustment	EA
R909.08	Adjust Valve Box to Grade - Extension Adjustment (Including Excavation and Backfill)	EA

ITEM NO.	ITEM	PAY UNIT
R909.09	Adjust Valve Box to Grade - Extension Adjustment (Including Excavation, Backfill and Surface Restoration)	EA
R909.10	Adjust Valve Box to Grade w/ Adjustment Rings	EA
R909.11	Adjust Valve Box to Grade w/ Adjustment Rings Furnished by Water Bureau	EA
R909.12	Replace Valve Box Top Section	EA
R909.13	Replace Valve Box Top Section (Including Excavation and Backfill)	EA
R909.14	Replace Valve Box Top Section (Including Excavation, Backfill and Surface Restoration)	EA
R912.01XX	X" Service Tap at Main, Corporation Stop and Connection	EA
R912.02XX	X" Service Tap at Main, Corporation Stop and Connection (Including Excavation and Backfill)	EA
R912.03XX	X" Service Tap at Main, Corporation Stop and Connection (Including Excavation, Backfill and Surface Restoration)	EA
R912.04	Abandon Existing Water Service at Tap	EA
R912.05	Abandon Existing Water Service at Tap (Including Excavation and Backfill)	EA
R912.06	Abandon Existing Water Service at Tap (Including Excavation, Backfill and Surface Restoration)	EA
R913.01XX	New X" Copper Water Service	LF
R913.02XX	New X" Copper Water Service (Including Excavation and Backfill)	LF
R913.03XX	New X" Copper Water Service (Including Excavation, Backfill and Surface Restoration)	LF
R913.04XX	New X" Copper Water Service at Existing Appurtenances	LF
R913.05XX	New X" Copper Water Service at Existing Appurtenances (Including Excavation and Backfill)	LF
R913.06XX	New X" Copper Water Service at Existing Appurtenances (Including Excavation, Backfill and Surface Restoration)	LF
R913.07XX	Extend Existing Service w/ New X" Copper Water Service	LF
R913.08XX	Extend Existing Service w/ New X" Copper Water Service (Including Excavation and Backfill	LF
R913.09XX	Extend Existing Service w/ New X" Copper Water Service (Including Excavation, Backfill and Surface Restoration)	LF
R914.01XX	Furnish and Install New X" Curb Stop and Box at New Water Service	EA
R914.02XX	Furnish and Install New X" Curb Stop and Box at New Water Service (Including Excavation and Backfill)	EA
R914.03XX	Furnish and Install New X" Curb Stop and Box at New Water Service (Including Excavation, Backfill and Surface Restoration)	EA
R914.04XX	Furnish and Install New X" Curb Stop and Box at Existing Water Service	EA

ITEM NO.	ITEM	PAY UNIT
R914.05XX	Furnish and Install New X" Curb Stop and Box at Existing Water Service (Including Excavation and Backfill)	EA
R914.06XX	Furnish and Install New X" Curb Stop and Box at Existing Water Service (Including Excavation, Backfill and Surface Restoration)	EA
R914.07XX	Furnish and Install New X" Curb Stop	EA
R914.08XX	Furnish and Install New X" Curb Stop (Including Excavation and Backfill)	EA
R914.09XX	Furnish and Install New X" Curb Stop (Including Excavation, Backfill and Surface Restoration)	EA
R914.10	Replace Existing Curb Box Assembly	EA
R914.11	Replace Existing Curb Box Assembly (Including Excavation and Backfill)	EA
R914.12	Replace Existing Curb Box Assembly (Including Excavation, Backfill and Surface Restoration)	EA
R914.13	Adjust Existing Curb Box	EA
R914.14	Adjust Existing Curb Box (Including Excavation and Backfill)	EA
R914.15	Adjust Existing Curb Box (Including Excavation, Backfill and Surface Restoration)	EA
R914.16	Relocate Existing Curb Box Assembly	EA
R914.17	Relocate Existing Curb Box Assembly (Including Excavation and Backfill)	EA
R914.18	Relocate Existing Curb Box Assembly (Including Excavation, Backfill and Surface Restoration)	EA
R914.19	Remove Existing Curb Box Assembly	EA
R914.20	Remove Existing Curb Box Assembly (Including Excavation and Backfill	EA
R914.21	Remove Existing Curb Box Assembly (Including Excavation, Backfill and Surface Restoration)	EA
R914.22	Adjust Existing Water Meter Box	EA
R914.23	Adjust Existing Water Meter Box (Including Excavation and Backfill)	EA
R914.24	Adjust Existing Water Meter Box (Including Excavation, Backfill and Surface Restoration)	EA
R914.25	Remove Existing Water Meter Box	EA
R914.26	Remove Existing Water Meter Box (Including Excavation and Backfill)	EA
R914.27	Remove Existing Water Meter Box (Including Excavation, Backfill and Surface Restoration)	EA
R915.01XX	Relocate X' Water Service Meter	EA
R916.01XX	X" Temporary Bypass Pipe	LF
R916.02	Temporary Service Connection - 2" and Smaller	EA
R916.03	Temporary Service Connection - Larger than 2"	EA
R916.04	Temporary Fire Hydrant	EA
R917.01	New Hydrant	EA

ITEM NO.	ITEM	PAY UNIT
R917.02	New Hydrant (Including Removal of Existing Hydrant)	EA
R917.03	New Screw-In Type Replacement Hydrant (Including Removal of Existing Hydrant)	EA
R917.04	Relocate Existing Hydrant	EA
R917.05	Remove Existing Hydrant	EA
R917.06	Hydrant Marking Post	EA
R917.07	6" Hydrant Extension Kit	EA
R917.08	12" Hydrant Extension Kit	EA
R917.09	18" Hydrant Extension Kit	EA
R917.10	24" Hydrant Extension Kit	EA

SECTION R203 - EXCAVATION AND EMBANKMENT

R203 GENERAL

The work shall conform to the requirements of NYSDOT Section 203 with the following modifications:

R203-1 Description

Replace NYSDOT Section 203-1.01 in its entirety with the following:

R203-1.01 Unclassified Excavation

Estimated limits and descriptions of subsurface deposits, formations and facilities which may be shown on the plans, are supplied in accordance with Paragraph 5.2.1, Article 5 of the General Terms and Conditions of the City of Rochester Standard Constuction Documents.

Add a new subsection directly after NYSDOT Section 203.17 as follows:

R203-1.18 Rock Excavation

Rock excavation consists of boulders, concrete and masonry exceeding 1/2 cubic yard in volume; and ledge rock which cannot, in the opinion of the Project Manager, be removed without blasting or the use of pneumatic hammers. Concrete pavements and pavement foundations, and sewers and their appurtenances will not be considered rock. Rock excavation for trenches or test pits will be included in Section R206.

R203-2 Materials

Add new subsections directly after NYSDOT Section 203-2.04, as follows:

R203-2.05 Select Granular Backfill - Pipe

Materials shall consist of sand and gravel, approved blast furnace slag, or stone. All materials furnished shall be well graded from coarse to fine and free from organic or other deleterious materials.

A. Gradation

Sieve Size	Percent Passing By Weight
3 inch	100
2 inch	90-100
1/4 inch	30-65
No. 40	5-40
No. 200	0-10

B. Soundness

Material will be accepted on the basis of a Magnesium Sulfate Soundness Loss after 4 cycles of 20 percent or less.

C. Plasticity Index

The plasticity index of the material passing the No. 40 mesh sieve shall not exceed 5.0.

D. Elongated Particles

Not more than 30 percent by weight, of the particles retained on a 1/2 inch sieve shall consist of flat or elongated particles. A flat or elongated particle is defined as one which has its greatest dimension more than 3 times its least dimension. Acceptance for this requirement will normally be based on a visual inspection by the Project Manager. When the City elects to test for this requirement, material with a percentage greater than the allowable 30 percent, will be rejected.

All material shall meet the specified gradation prior to placement. All processing shall be completed at the source.

R203-2.06 Select Granular Backfill - Polyvinyl Chloride Pipe

The material shall conform to the requirements of Subsection R203-2.02, except that the gradation shall be as follows:

Sieve Size	Percent Passing By Weight
2 inch	100
1/4 inch	30-65
No. 40	5-40
No. 200	0-10

This material shall be used for backfilling of trenches when polyvinyl chloride pipe is used.

R203-2.07 Stone Bedding

Material furnished shall be size Designation 1, per NYSDOT Section 703-02, Table 703-4 and shall meet all of the requirements of NYSDOT Section 703-02.

Stone bedding shall meet the following gradation requirements:

Sieve Size	Percent Passing By Weight
1 inch	100
1/2 inch	90-100
1/4 inch	0-15

R203-2.08 Sand

Sand shall consist of clean, hard, durable, uncoated particles, free from lumps of clay and all deleterious substances.

When dry, the sand shall meet the following gradation requirements:

Sieve Size	Percent Passing By Weight
1/4 inch	100
No. 50	0-35
No. 100	0-10

The sand may be determined to be unacceptable if it contains loam or silt in excess of 10 percent of the total volume.

R203-3 Construction Details

Add a new subsection directly after NYSDOT Section 203-3.20, as follows:

R203-3.21 Select Granular Backfill, Stone Bedding, and Sand

Select granular backfill, stone bedding, and sand shall be placed as shown on the plans. Compaction shall comply to the requirements of NYSDOT Section 203-3.12.

Replace NYSDOT Section 203-3.03: 1) in its entirety with the following:

R203-3.03 Scheduling of Work to Minimize Soil Erosion and Water Pollution

1) The work shall be progressed in such manner that the exposed, unprotected surface area of any earth material that is subject to erosion by wind or water, will not exceed a total of 10,000 square feet at any given time. Work progression shall include any special soil erosion, water and air pollution measures required in the Supplementary Conditions, and:

R203-4 Method of Measurement

Add new subsections directly after NYSDOT Section 203-4.14 as follows:

R203-4.15 Rock Excavation

The quantity to be measured for payment shall be the number of cubic yards of rock excavated, as computed in the original position.

R203-4.16 Select Granular Backfill, Stone Bedding and Sand

The quantity to be measured for payment shall be the number of cubic yards of material placed, as measured in the completed work within the payment lines.

R203-5 Basis of Payment

Add new subsections directly after NYSDOT Section 203-5.06 as follows:

R203-5.07 Rock Excavation

The unit price bid shall include the cost of: excavation; disposal of the excavated material; blasting; and furnishing all labor, material and equipment necessary to complete the work.

R203-5.08 Select Granular Backfill, Stone Bedding and Sand

The unit price bid shall include the cost of: furnishing, placing and compacting the material; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R203.22	Rock Excavation and Disposal	Cubic Yard
R203.23	Select Granular Backfill (Pipe)	Cubic Yard
R203.24	Select Granular Backfill (PVCP Pipe)	Cubic Yard
R203.25	Stone Bedding	Cubic Yard
R203.26	Sand	Cubic Yard

SECTION R204 - MILLING

R204-1 DESCRIPTION

The work shall consist of the cold mechanical milling of the existing street pavement surface as shown on the drawings and as directed by the Project Manager.

R204-2 MATERIALS

R204-2.01 General

Sweepers, loaders and trucks of sufficient number and size suitable for handling the asphalt millings shall be provided. All equipment shall be in good repair and be capable of removing all of the milled material after each day's operation. No loose material will be permitted to remain on the milled surface.

R204-2.02 Milling Equipment

The milling machine shall be especially designed and built for milling flexible pavements, and possess the ability to mill concrete and brick surfaces when encountered under bituminous surfaces. It shall be self-propelled and have the means for milling without tearing or gouging the underlying surface and be capable of blading the cuttings into a windrow. The machine shall consist of a 30 inch minimum width cutting drum with carbide tip cutting teeth. Variable lacing patterns shall be provided to permit a rough grooved or smooth surface. The striations produced by the lacing patterns shall not be greater than 3/8 inch deep. The machine shall be capable of being operated at speeds from 10 to 40 feet per minute, and designed so that the operator can observe the milling operation at all times without leaving his control area. The machine shall be adjustable and shall be able to provide 0 to 3 inch deep cut in one pass. It also shall be capable of cutting the surface immediately adjacent to the existing vertical curb face.

R204-3 CONSTRUCTION DETAILS

R204-3.01 General

Hours of work are subject to control by the Project Manager, with no work being permitted after sunset.

The Project Manager has the right to control and change the order in which the work shall be done by giving the Contractor a revised list prior to starting any one street. Prior to starting work on any street, the Project Manager will advise the Contractor of the amount of removal to be done in inches for each pass. The Project Manager will provide the milling limits by marking the pavement before any milling operation begins. After work starts, the depth of the cut may be varied to suit field conditions.

On streets requiring differential or variable depth milling, the depth of milling will vary at the center of the pavement, at the curb, and at other locations along the street. Depths will be as indicated on the plans or controlled by the theoretical grade line and cross slope as required. Milling cut sheets shall be submitted at 25 foot intervals to the Project Manager after the milling work has been completed, and prior to placement of any truing and leveling course or final paving.

Prior to beginning the work, and at the request of the Project Manager, a test section of at least 200 feet by 10 feet shall be constructed, and the ability of the equipment, workmanship, procedures and methods used to accomplish the work shall be satisfactorily demonstrated to the Project Manager. In the event the Project Manager does not approve of the test section, the milling operation shall be suspended until proper adjustments are made to the equipment and methods of construction to construct a satisfactory test section.

Prior to the start of the milling operation, the existing surface shall be power swept to remove any material lying on the surface such as debris, mud, sand or any other deposited material. All materials accumulated during the sweeping operation shall be disposed of separately and shall not be mixed with the milled materials. The power sweeper shall contain a mechanism to confine any dust which may evolve during the sweeping operation.

The milled surface shall be free from tears, gouges, shoves, breaks or excessive grooves. The surface tolerance shall be such that when a 10 foot straight edge is laid laterally, the variance shall be less than 3/8 inch and when the 10 foot straight edge is laid longitudinally, the variance shall be less than 3/16 inch.

Manholes, catch basins and valve boxes shall be adequately covered to prevent any milled materials from entering them. All milled materials that enter any manhole, catch basin or valve box shall be removed.

Sidewalks, trees, shrubbery, manholes, catch basins, curbs, vault covers, valve boxes, hydrants and all other items shall be protected from any damage that may be caused by construction operations.

R204-3.02 Operations

When milling around existing manholes, catch basins, valve boxes, vaults, etc., the Contractor has the option of how close to mill to these appurtenances. Any existing unmilled pavement left around manholes, catch basins, valves, or other appurtenances shall be removed by hand. Removal by hoe ramming is not permitted. Cold patch asphalt or fresh millings shall be placed at a 1 on 12 slope, at all manholes, catch basins, and valve boxes which are exposed 1 inch or more, after existing pavement has been removed. No manhole, catch basin, or valve box shall be left unpadded overnight unless a lighted barricade is placed around the exposed appurtenance.

All adjacent milled surfaces, or milled surfaces adjacent to unmilled surfaces, shall not have a difference in elevation greater than 1 inch at the end of each work day. All adjacent surfaces either parallel or transverse to the curb line, shall be padded with cold patch asphalt or fresh millings at a 1 on 12 slope, or milled at a 1 on 12 slope at the end of each work day.

All supplementary work such as hand chiseling and clean up operations, shall be completed within two working days after the milling operations has been completed on any particular street block. The milled surface shall be swept at the end of each day's operation. Upon completion of the milling operation, the milled surface shall be kept free of mud, dust or other foreign material and shall be cleaned in a satisfactory manner by the Resurfacing Contractor prior to the application of a new wearing course.

R204-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of square yards of pavement milled. No deductions will be made for minor areas not milled such as catch basins, manholes, and valve boxes.

R204-5 BASIS OF PAYMENT

R204-5.01 General all Items

The unit bid price shall include the cost of: cleaning pavement; maintenance of traffic; milling; removal and disposal of the milled materials; hand work around structures and along the curb; furnishing, placing and maintaining temporary pavement material where required; protection of sidewalks, trees, shrubbery, manholes, curbs, vault covers, valve boxes and hydrants; all survey and measurements necessary to assure the removal of material to the depths required; survey and stake out for milling cut sheets; and furnishing all labor, material and equipment necessary to complete the work.

The resurfacing Contractor shall install any valve box adjustment rings which are furnished by the Water Bureau.

R204-5.02 Milling-Variable Depth

Payment will be made for the total area of pavement milled, regardless of the depth of the milling.

R204-5.03 Milling - 2", 3", 4" and Over Thickness

Payment will be made for the thickness of material removed as required. No additional payment will be made for removal of any material at a thickness greater than that required. Removal of asphalt up to 2 inches, or 3 inches and greater, will be measured and paid under separate bid items. Where removal at a thickness other than the one indicated in the Proposal is ordered by the Project Manager, payment will be made at the next higher increment of thickness. Any additional milling depth over the largest depth given in the Proposal will be paid for at 20 percent

of the 2 inch milling bid price for each additional 1/2 inch depth required. Payment will be under the appropriate bid item, regardless of the number of passes required to reach the specified depth. Where differential milling is required and depth of removal will vary across the width of the machine, payment will be made for the average section specified across the width of the machine.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R204.01	Milling - Variable Depth	Square Yard
R204.02	Milling - 2" Thickness	Square Yard
R204.03	Milling - 3" Thickness	Square Yard
R204.04	Milling - 4" and Over Thickness	Square Yard

SECTION R205 - PAVEMENT BASE REPAIR

R205-1 DESCRIPTION

The work shall consist of the excavation, removal, disposal, and reconstruction of sections of existing pavement base, in locations as shown on the plans and as directed by the Project Manager.

R205-2 MATERIALS

R205-2.01 Select Granular Fill

Select granular fill shall meet the requirements of Section R203.

R205-2.02 Asphalt

Asphalt materials shall meet the requirements of NYSDOT Section 403, for asphalt base and binder.

R205-2.03 Concrete

Concrete shall meet the requirements of NYSDOT Section 503, for Class C concrete.

R205-3 CONSTRUCTION DETAILS

R205-3.01 General

In areas where the existing pavement base has failed, the deteriorated base shall be replaced prior to the resurfacing of the roadway.

The exact limits of removal will be as established by the Project Manager. No payment will be made for replacement made outside these limits. Prior to starting any excavation, the existing base shall be saw cut to its full depth with a concrete saw at all work limit lines.

The existing roadway material shall be removed to a minimum depth of 1 foot 6 inches to eliminate the area of base failure.

When excavating material from the area to be replaced, the material shall be excavated to neat lines. The cut shall be clean, dry and shaped so that a square shoulder in the direction of traffic is provided against which the patch shall be placed.

R205-3.02 Concrete Base Repair

Select granular fill shall be placed to bring the subbase grade to a point 10 inches below the existing pavement surface. Backfilling of the cavity shall include a minimum 8 inch thick concrete base course with a 2 inch asphalt binder course placed on top of the concrete base. An asphalt tack coat shall be applied on top of the concrete base before the binder course is placed.

All backfill material, including binder, shall be properly compacted. For small areas, either a hand operated vibrating tamper or a power jumping jack shall be used for compaction purposes.

R205-3.03 Asphalt Base Repair

Select granular fill shall be placed to bring the subbase grade to a point 10 inches below the existing pavement surface on commercial streets, and 7 inches below the existing pavement surface on residential streets. Backfilling of the cavity shall include an 8 inch thick asphalt base course for commercial streets placed in two 4 inch lifts; and a 5 inch asphalt base course for residential streets. A 2 inch asphalt binder course shall be placed on top of the asphalt base course.

All backfill material, including asphalt base and binder, shall be properly compacted. For small areas, either a hand operated vibrating tamper or a power jumping jack shall be used for compaction purposes.

R205-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of square yards of pavement base repaired.

R205-5 BASIS OF PAYMENT

R205-5.01 General All Items

The unit price bid per square yard shall include the cost of: full depth saw cutting; excavation and disposal of the existing material; furnishing, placement and compacting of the select granular fill; concrete or asphalt base course; tack coat; binder; and furnishing all labor, material and equipment necessary to complete the work.

R205-5.02 Asphalt Base Repair

With the Project Manager's approval, asphalt binder material may be substituted for asphalt base material, at no additional cost to the City.

R205-5.03 Select Granular Fill

Select granular fill necessary for excavations which are more than 1 foot 6 inches below the existing pavement surface shall be paid under the appropriate item in Section R203.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R205.01	Concrete Base Repair	Square Yard
R205.02	Asphalt Base Repair - Commercial	Square Yard
R205.03	Asphalt Base Repair - Residential	Square Yard

SECTION R206 - TRENCH AND CULVERT EXCAVATION

R206-1 DESCRIPTION

The work shall consist of the excavation required for trenches, culverts, catch basins, manholes, conduit and direct burial cable in locations as shown on the plans and as directed by the Project Manager.

R206-2 MATERIALS

None specified.

R206-3 CONSTRUCTION DETAILS

206-3.01 General

The appropriate construction details specified for Excavation and Embankment in NYSDOT Section 203-3.01 through and including 203-3.12, and 203-3.15 shall apply to the work specified in this section.

The excavation shall be dewatered when necessary and kept free from water, snow and ice during construction.

Special care shall be taken not to disturb the bottom of the excavation, nor to remove the material at final grade, until just before the catch basin or manhole is placed.

All excavation operations shall be carried out in a safe and prudent manner so that the worker, public, and adjacent property will be protected from unreasonable hazard. All applicable local, State and Federal requirements shall be observed, and all necessary permits shall be acquired by the Contractor.

Trenches that are left open overnight and on nonworking days, shall be adequately protected per NYSDOT Section 107-05E, Guarding and Protection.

Instead of using sheeting, and only with written approval from the Project Manager, the excavation may be opened with the sides sloped to a stable slope not steeper than that allowed by the the Title 29 Code of Federal Regulations, Part 1926, Safety and Health Regulations for Construction (OSHA). Taking this option, however, does not relieve the Contractor of its responsibilities as stated in this subsection. Where permitted to do this, the materials used and method of construction outside the payment lines shall be the same as those required for adjacent zones within the payment lines.

When excavation is required for the installation of conduit or direct burial cable, the Project Manager shall be notified upon completion of the excavation. No conduit or cable shall be placed in the excavation until the Project Manager has approved the depth and cross section of the trench.

No more than 200 linear feet of trench shall be allowed to be open or impassable at any one time in vehicular and pedestrian areas. All trench areas in excess of 200 linear feet in length shall be, plated or backfilled and restored with a temporary or permanent pavement surface to an elevation sufficient to maintain a safe, smooth, and dust free traveled way.

R206-3.02 Replacement of Pavement Structure Courses

When placing conduit, direct burial cable or utilities, and the existing pavement, subgrade, subbase, or shoulder courses are removed, such courses shall be replaced in kind and character in order to maintain a uniform road section.

R206-3.03 Disposal of Excavated Material

The provisions of NYSDOT Subsections 203-3.06 and 203-3.07 shall apply to all material excavated under this section which is not used as backfill.

R206-3.04 Rock Excavation in Trenches and Test Pits

Rock excavation in trenches consists of boulders, concrete and masonry exceeding 1/2 cubic yard in volume; and ledge rock which cannot, in the opinion of the Project Manager, be removed without blasting or the use of pneumatic hammers. Concrete pavements and pavement foundations, and sewers and their appurtenances will not be considered rock.

All blasting shall be done in accordance with all State and local laws, ordinances, and regulations relative to rock blasting. Attention is also directed to any requirements in the Supplementary Conditions concerning blasting.

R206-4 METHOD OF MEASUREMENT

R206-4.01 General

The quantity to be measured for payment shall be the number of cubic yards of material excavated. Work performed beyond any designated payment line will not be included in the computation of quantities for the item involved.

R206-4.02 Trench and Culvert Excavation

Unless otherwise shown on the plans, payment lines for excavation of pipe and culvert lines, catch basins, and manholes will be determined as follows:

A. Bottom Payment Line - The elevation of the bottom payment line shall be the elevation of the bottom of the cradle of the pipe, conduit, or culvert, and the bottom of the stone foundation course for catch basins or manholes.

B. Top Payment Line - The top payment line shall be the top of the existing surface at the time of excavation.

C. Side Payment Lines - The side payment lines of the excavation shall be vertical and extend out 12 inches from the perimeter of the pipe or culvert to the bottom payment line, regardless of whether sheeting is or is not required or used.

For utility lines, exclusive of conduit and cable lines, of less than 12 inch diameter, the excavation width shall be the actual bottom width necessary, to properly perform the installation work required, or 3 feet, whichever is less.

For pipes, conduits, or culverts of nominal horizontal dimensions of 12 to 144 inches, the width of the excavation at the bottom payment line shall be the nominal inside horizontal dimension of pipe, conduit, or culvert plus 4 feet, or 3 times the nominal inside horizontal dimension, whichever is less. For pipes with a nominal horizontal dimension greater than 144 inches, the width will be as shown on the appropriate detail drawings, or in the Contract Documents for concrete pipe, with 2 times the minimum wall thickness being added to the preceding.

D. Payment Lines for Catch Basins and Manholes - Payment lines for catch basins and manholes shall be vertical from the bottom of the footing and extend out 1 foot 6 inches from the perimeter of the structure. The top payment line shall be the same as outlined under paragraph B.

R206-4.03 Rock Excavation

Volumes of boulders, concrete, and masonry to be paid for under this item shall be as measured by the Project Manager in the original position.

R206-4.04 Conduit Excavation and Backfill

The quantity to be measured for payment shall be the number of linear feet measured along the center of the conduit or cable placed. The linear foot measurement shall be in accordance with the following method:

A. Wherever a pair or group of conduits or cables are physically connected together, they shall be considered as a single conduit or cable.

B. Wherever conduit or cable in the same trench are physically separated laterally by a minimum of 6 inches from adjacent conduit or cable, the linear foot measurement shall be made along the center of each conduit or cable.

C. Wherever a pair or group of conduits or cable in the same trench are physically separated laterally by less than 6 inches of adjacent conduit or cable, the linear foot measurement for those conduits or cable shall be made along the center of that pair or group.

R206-5 BASIS OF PAYMENT

R206-5.01 Trench and Culvert Excavation

The unit price bid per cubic yard shall include the cost of: guarding and protection required to protect the public; saw cutting; excavation; backfilling of the trench when locally excavated material is used; disposal of excavated material; keeping the excavation dewatered as necessary and free from earth, water, ice and snow during construction; and furnishing all labor, material and equipment necessary to complete the work.

The cost of temporary sheeting and shoring shall generally be included in the price bid for all items in this section. No separate payment will be made for temporary sheeting, except where specifically required on the plans, and as indicated in the Contract Documents. Temporary sheeting and shoring shall be as required by the plans, specifications, Title 20 Code of Federal Regulations, Part 1926, Safety and Health Regulations for Construction (OSHA), and by the Project Manager.

All hand or tunnel excavation in and around water lines, gas lines, sewers, steam lines, electric conduit, telegraph conduit, telephone conduit, tree roots, pipe joints, and curbs shall be included in the price bid for all items in this section. Conditions that prohibit blasting of rock will not warrant additional payment under rock excavation for trenches or test pits.

Progress payments will be made after the excavation has been completed, and prior to the completion of other work included under this item, including but not limited to pumping, fencing and backfilling. Payment will be made, at the unit price bid.

R206-5.02 Cofferdams

Payment for cofferdams required by the plans, specifications, Title 29 Code of Federal Regulations, Part 1926, Safety and Health Regulations for Construction (OSHA), and by the Project Manager, will be made under NYSDOT Section R552.

Where cofferdams are specified for structure excavation, the work required to keep the site free from earth, water, ice and snow during construction shall be included in the item for cofferdams.

R206-5.03 Replacement of Pavement Structure Courses

With exception of the conduit excavation and backfill item, the work of replacing pavement, subcourses and shoulder courses shall be paid for and performed under the provisions of their respective items and subsections.

R206-5.04 Conduit Excavation and Backfill

The unit price bid per linear foot shall include the cost of: saw cutting; excavation; backfill; surface restoration; disposal of excavated material; compaction; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R206.04	Trench and Culvert Excavation	Cubic Yard
R206.05	Trench and Culvert Rock Excavation	Cubic Yard
R206.06	Conduit Excavation and Backfill	Linear Foot
R206.07	Excavation for Test Pits	Cubic Yard
R206.08	Rock Excavation for Test Pits	Cubic Yard

SECTION R207 - PAVEMENT FABRIC

R207-1 DESCRIPTION

The work shall consist of the installation of an asphaltic nonwoven polyester fabric for crack and joint repair as shown on the plans and as directed by the Project Manager.

R207-2 MATERIALS

R207-2.01 Fabric

The material shall be a high density asphalt mastic sandwiched between two layers of nonwoven polyester fabric such as PavePrep, as manufactured by PavePrep Corporation, or approved equivalent; and shall meet the following properties:

Density	80 Lbs/CF	ASTM E12-70
Weight	0.9 Lbs/SF	
Caliper (Retains 95% caliper after loading)	0.135 Inches	ASTM D1777
Absorption	1% max.	ASTM D517-68
Brittleness	Pass	ASTM D517-68
Softening Point (Mastic)	200°F min.	ASTM D2398-68
Cold Flex (2" x 5" Specimen 180°F bend on 2" Mandrel - 0°F)	No Cracking	
Heat Stability (2" x 5" Specimen Hung Vertically in a in a Mechanical Convection Oven - 2 Hours - 190°F)	No Dripping or Delamination	
Polyester Reinforcement: Cycles to Break (Single Fiber)	2,100,000 plus	
Flammability (Self-Extinguishing, no burn rate when tested in accordance with Federal DOT Specification 302)		
Per cent Elongation	100%	Instron
Tensile Strength	1000 Lbs/Sq Inch	Instron
Width	20 Inches min.	

R207-2.02 Tack Coat

Tack coat that is to be applied to the pavement surface shall be Asphalt Cement Grade AC-20, meeting the requirements of AASHTO M226. Higher penetration asphalts (i.e. CRS-2 or RS-2) or heavier coverage may be required for cold weather applications, in severely cold climates, or for application on milled surfaces.

R207-3 CONSTRUCTION DETAILS

R207-3.01 General

The fabric shall be installed in strict accordance with the manufacturer's latest instructions and as approved by the Project Manager.

R207-3.02 Surface Preparation

The surface upon which the fabric is to be placed shall be cleaned and kept cleaned of all dirt, water, vegetation and any other extraneous material. Cracks that are larger than 1-1/4 inch in width and all holes shall be cleaned of all dirt and loose material, and then filled with an acceptable cold or hot asphalt concrete material.

207-3.03 Tack Coat Application

The tack coat is to be applied uniformily by either power spray units or pour pots. The minimum application temperature for AC-20 is 290°F. It is important when applying the tack coat to remember that the edges of the fabric are to be well bonded to the existing pavement surface.

A mechanical distributor or motorized tar kettle, equipped with a hand held wand, should be used for applying the tack coat. A pour pot may be used for applying the tack coat when use of the mechanical distributor or motorized tar kettle is not practical, or if they are unavailable. Apply the tack coat in a ribbon effect when using a pour pot.

In warm weather conditions (60°F and rising), the tack coat shall be applied at the rate of 0.10 gallons per square yard. In cold weather conditions (45°F and rising), the tack coat shall be applied at a rate of 0.10 to 0.20 gallons per square yard. In no case is the rate of application to exceed 0.25 gallons per square yard.

The width of the tack coat application is to be the width of the material plus 2-3 inches, and shall be applied no further in advance of the fabric placement than can be accomplished without losing the adhesive abilities of the tack. In cold weather, the advance application distance is to be no more than 5 feet.

In certain applications a high solids emulsion, such as CRS-2 or RS-2, may be used as a tack, but caution must be exercised to let the emulsion break prior to embedment of the fabric. When using an emulsion tack, the overspray area must not exceed 2 inches.

R207-3.04 Sand

Although not required, small amounts of washed sand may be used to blot excess asphalt to facilitate movement of traffic or construction equipment over the fabric, prior to the asphalt overlay. Hot mix asphalt can be sanded out on the fabric ahead of the paver, if the fabric is sticking the paver or to truck tires.

R207-3.05 Fabric Placement

No special equipment is needed for handling rolls of fabric. A steel bar can be inserted through the core of the roll, and then suspended in any manner from the back of a truck for easy roll-off, or rolled along the crack manually.

Razor blade knives should be provided to cut the fabric. A hand roller may be used to facilitate contact during cold weather applications. Hand rolling is not necessary during warm weather.

Air and pavement temperatures during fabric installation are to be sufficiently warm to allow adequate tacking. Fabric installed in cold weather is to be overlayed as soon as it is reasonably possible. The combination of cold brittle tack and traffic, may cause some breaking loose of the fabric.

The fabric shall be placed into the tack prior to the time the asphalt tack coat has cooled and lost its tackiness. The woven polyester side of the fabric should be placed up (exposed to traffic).

Where transverse and longitudinal joints meet, the fabric may be butted or overlapped. Overlapping is mandatory on bridge decks, or where intentional waterproofing is desired. Where overlapping is used, additional tack will required to bond the two fabric areas together.

Cornering can be accomplished without sectioning the fabric by walking the gathered fabric to one spot, slicing the bubble out with a razor knife, and then tacking the overlap.

Hot mix asphalt overlay can immediately follow placement of the fabric. If required, the overlay can be delayed and the area reopened to traffic.

R207-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of square feet of fabric installed.

R207-5 BASIS OF PAYMENT

The unit price bid per square foot shall include the cost of: furnishing and placing asphaltic materials; fabric; crackfiller; AC-20 tack coat; cleaning, repairing, filling joints and cracks; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R207.05	Polyester Fiber Fabric Reinforcement	Square Foot

SECTION R404 - RECYCLED ASPHALT CONCRETE PAVEMENT

R404-1 DESCRIPTION

The work shall consist of constructing a hot, plant mixed recycled asphalt concrete pavement on a prepared base in reasonable close conformity with the required lines, grades, thickness and typical sections as shown on thc plans and as directed by the Project Manager.

R404-2 MATERIALS

R404-2.01 General

The materials furnished shall conform to the requirements of NYSDOT Section 401, Table 401-1 for Type 1 base, Type 3 binder, Type 7F top.

R404-2.02 Composition of Mixtures

The virgin materials such as coarse aggregate, fine aggregate and mineral filler required to meet gradation and composition requirements, shall consist of material conforming to the requirements of NYSDOT Sections 703-01, 703-02 and 703-08.

The type and grade of bituminous material shall be as specified in NYSDOT Table 401-1, and shall meet the requirements of NYSDOT Section 702.

All other requirements of NYSDOT Section 401 shall be met except for the following modifications:

A. The bituminous mix shall be composed of a mixture of salvaged material, new aggregate (coarse aggregate, fine aggregate and mineral filler, if required) and bituminous material.

B. The blend percentages of salvaged material shall not exceed 50 percent.

C. The bituminous material added can be grade AC-5 meeting the requirements of NYSDOT Material Designation 702-0200 except that the maximum penetration for 77F, 100g, 5s, shall be 170.

D. The salvaged material shall not be contaminated by foreign materials.

E. Only an approved drum mix plant shall be used where the salvaged material shall be fed into the drum so that it will not come in direct contact with the burner flame. Mixing with the new aggregate shall occur before the bituminous material introduction point.

F. The moisture content of the mixture upon discharge from the mixer shall not exceed 1.5 percent.

R404-3 CONSTRUCTION DETAILS

The construction details shall comply with the requirements specified in NYSDOT Section 401.

R404-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of tons of compacted material installed.

R404-5 BASIS OF PAYMENT

The unit price bid per ton shall include the cost of: furnishing and placing recycled asphalt material; including asphalt cement; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R404.01	Recycled Asphalt Base Course	Ton
R404.02	Recycled Asphalt Binder Course	Ton
R404.03	Recycled Asphalt Top Course	Ton
R404.04	Recycled Asphalt Concrete - Truing and Leveling Course	Ton

SECTION R406 - PAVEMENT KEY

R406-1 DESCRIPTION

The work shall consist of constructing pavement keys in locations as shown on the plans and as directed by the Project Manager.

R406-2 MATERIALS

None specified.

R406-3 CONSTRUCTION DETAILS

The construction of pavement keys shall consist of cutting and removing a portion of the existing pavement to the required depth and width.

No pavement key shall be left void of material overnight. The Contractor may leave the existing key material in place until the resurfacing operation begins.

The pavement key shall be required to be used for the following situations:

A. At the beginning and end of each individual milling and resurfacing project.

B. At intersecting streets where a transition from the existing roadway to a new resurfaced roadway is required.

C. At select driveway entrances only as ordered by the Project Manager.

R406-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of linear feet of pavement keyed, as measured along one saw cut edge of the pavement key.

R406-5 BASIS OF PAYMENT

The unit price bid per linear foot shall include the cost of: cutting out the existing roadway material; removing and disposing of the material; and furnishing all labor, material and equipment necessary to complete the work.

Asphalt replacement will be paid for separately under the appropriate item in Sections R404 and NYSDOT Section 403.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R406.01	Pavement Key	Linear Foot

SECTION R407 - TACK COAT

R407-1 DESCRIPTION

The work shall consist of preparing and treating an existing bituminous or portland cement concrete surface with bituminous tack coat in reasonably close conformity with the limits as shown on the plans and as directed by the Project Manager.

R407-2 MATERIALS

The bituminous tack coat shall meet the requirements of NYSDOT Section 702 for the following designation:

Asphalt Emulsion for Tack Coat 702-90

R407-3 CONSTRUCTION DETAILS

R407-3.01 Equipment

The Contractor shall provide a distributor for applying the tack coat. The distributor shall be designed, equipped, maintained and operated so that the tack coat can be heated and applied uniformly on variable widths of surface up to 15 feet at readily determined and controlled rates from 0.03 to 2.0 gallons per square yard, with uniform pressure, and with an allowable variation from any specified rate not to exceed 0.02 gallons per square yard. Distributor equipment shall include a tachometer, accurate metering device or a calibrated tank, and a thermometer for measuring temperatures of tank contents. Distributors shall be equipped with a power unit for the pump, and full circulation spray bars adjustable laterally and vertically.

The distributor may be equipped with an attached bristle broom designed such that it drags on the pavement behind the spray bars. If the broom is used, it shall be adjustable laterally and vertically so that the full width of the applied tack coat is broomed uniformily onto the pavement surface.

Distributors shall be equipped with an approved bituminous material sampling valve. When samples are taken through such valves, they shall be considered representative of all material in the tank.

Smaller power spray units of hand spray equipment will be permitted only in areas where the use of a distributor is impractical.

R407-3.02 Application of Bituminous Material

The tack coat shall be uniformily applied by a pressure distributor to a prepared clean pavement. The tack coat shall be applied to offer the least inconvenience to traffic and to permit one-way traffic, where practical, to prevent pickup or tracking of the bituminous material.

Tack coat shall not be applied on a wet pavement surface or when the pavement surface temperature is below 45°F. The application rate shall be 0.03 to 0.07 gallons per square yard, as required.

R407-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of square yards of pavement surface treated, or the number of gallons of asphalt emulsion for tack coat. The number of gallons shall be as measured at 60°F.

R407-5 BASIS OF PAYMENT

The unit price bid per square yard or gallon shall include the cost of: furnishing and placing asphalt emulsion; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R407.02	Tack Coat	Square Yard
R407.03	Tack Coat	Gallon

SECTION R408 - COATING BITUMINOUS PAVEMENT

R408-1 DESCRIPTION

The work shall consist of applying a coal tar pitch emulsion for coating bituminous pavements as shown on the plans and as directed by the Project Manager.

R408-2 MATERIALS

R408-2.01 General

The material shall be homogenous and show no separation or coagulation of components that cannot be overcome by moderate stirring. It shall be capable of application and complete coverage by squeegee, brush, or by approved mechanical methods, to the surface of bituminous pavements at a spreading rate of 1.5 to 2.5 gallons per 100 square feet in two coats. The emulsion shall be prepared from straight run high temperature coke oven tar. Petroleum tar and oil, and water gas tars shall not be used.

R408-2.02 Chemical and Physical Requirements

A. General. The material shall conform to the following requirements prior to fortification with antifreeze:

	Maximum Percent	Minimum Percent
Water	53	–
Nonvolatile	–	47
Ash of Nonvolatiles	40	30
Solubility of Nonvolatiles in CS2	–	20
Specific Gravity at 75°F	–	1.2

B. Drying Time. The coating shall exhibit "final set" in not more than 8 hours.

C. Adhesion and Resistance to Kerosene. The cured coating shall exhibit no penetration or loss of adhesion.

D. Adhesion and Resistance to Water. The cured coating shall exhibit no blistering, loss of adhesion, or tendency to reemulsify.

E. Resistance to Heat. The cured coating shall show no sign of blistering, sagging, or slipping when heated at 175°F, for 2 hours.

F. Flexibility. The coating shall show no flaking, cracking, or loss of adhesion to the surface.

G. Resistance to Impact. The coating shall exhibit no chipping, flaking, cracking, or loss of adhesion extending more than 1/4 inch beyond the periphery of the area of impact. This requirement may be waived at the discretion of the Project Manager, provided the supplier can furnish a certification of satisfactory field performance record of not less than 3 years.

H. Resistance to Volatilization. Resistance to volatilization shall be determined in accordance with ASTM D1010, except that the residue from the procedure outlined in Section 6 shall be heated in an oven at 520°F for 30 minutes. The loss in weight shall not exceed 10 percent.

I. Wet Film Continuity. Emulsion, when wet, shall be uniformly smooth, nongranular consistency free from coarse particles.

J. Resistance to Freezing. When specified, emulsion shall be fortified with antifreeze and be capable of exposure for 24 hours at 0°F and when warmed to 75°F shall return to a homogeneous consistency with stirring.

R408-2.03 Tests and Control Methods

Material tests and quality control pertaining to the work of this section will be performed in conformance with the requirements of ASTM D1010, D466, D529, and D244.

R408-3 CONSTRUCTION DETAILS

Existing area shall be thoroughly cleaned by use of hand brooms or mechanical sweepers and all existing cracks shall be cleaned and filled per NYSDOT Section 633.

Emulsion shall be applied per manufacturer's recommendations, and as approved by the Project Manager.

R408-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of square yards of surface area coated.

R408-5 BASIS OF PAYMENT

The unit price bid per square yard shall include the cost of: furnishing and applying the emulsion; cleaning existing pavement; filling existing cracks; and furnishing all labor, material and equipment necessary to complete the work.

Payment shall be made under:

ITEM NO.	ITEM	PAY UNIT
R408.01	Seal Coat	Square Yard

SECTION R412 - TEMPORARY PAVEMENT

R412-1 DESCRIPTION

The work shall consist of the construction of a temporary pavement for pedestrian or vehicular traffic as shown on the plans and as directed by the Project Manager.

R412-2 MATERIALS

R412-2.01 Asphalt

Any of the following materials may be used:

A. Asphalt concrete - Type 3 binder course conforming to NYSDOT Section 403.
B. Recycled asphalt binder course conforming to Section R404.
C. Recycled asphalt top course conforming to Section R404.
D. Asphalt cold patch.

R412-2.02 Asphalt Millings

Asphalt millings shall be the product of milling of asphalt concrete roadways. Asphalt millings shall be free of organic materials, gravel, crushed stone or any other material not a direct product of a milling process.

R412-2.03 Subbase Course

Subbase course, Type 1 or 2 shall conform to NYSDOT Section 304.

R412-3 CONSTRUCTION DETAILS

A temporary pavement shall be provided where ordered by the Project Manager to accommodate vehicular or pedestrian traffic with 24 hours after written notice by the Project Manager. The temporary pavement shall be kept reasonably smooth and hard at all times, shall be well drained, free of potholes, bumps, irregularities, and depressions. The necessary equipment and personnel to attain and maintain a satisfactory riding surface shall be available and used as needed, at all times. Special attention to maintenance of the temporary pavement shall be given during weekends, holidays, and during the winter season.

The specified asphalt material shall be placed in accordance with the appropriate construction details as outlined in NYSDOT Section 403 and Section R404.

The subbase course shall be placed in accordance with the appropriate construction details as outlined in NYSDOT Section 304.

Asphalt cold patch and asphalt millings shall be placed only when hot mix asphalt is not available due to weather restrictions or as directed by the Project Manager.

Upon completion of the period that the temporary pavement will be required, the asphalt material and subbase course shall be removed and disposed of in accordance with the appropriate construction details as outlined in Section R203.

R412-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of square feet of temporary pavement installed and removed.

R412-5 BASIS OF PAYMENT

R412-5.01 Temporary Pavement

The unit price bid per square foot shall include the cost of: furnishing and placing asphalt material; maintaining the temporary pavement; furnishing and placing additional milling to maintain a smooth riding surface; removing and disposing of the asphalt millings; and furnishing all labor, material and equipment necessary to complete the work.

R412-5.02 Temporary Pavement With Subbase

The unit price bid per square foot shall include the cost of: furnishing and placing asphalt material and subbase course; maintaining the temporary pavement; furnishing and placing additional asphalt material to maintain a smooth riding surface; removing and disposing of the asphalt material and subbase course; and furnishing all labor, material and equipment necessary to complete the work.

R412-5.03 Asphalt Millings

The unit price bid per square foot shall include the cost of: furnishing and placing asphalt millings; maintaining the temporary pavement; furnishing and placing additional millings to maintain a smooth riding surface; removing and disposing of the asphalt millings; and furnishing all labor, material and equipment necessary to complete the work.

R412-5.04 Asphalt Milling Pavement with Subbase

The unit price per square foot shall include the cost of: furnishing and placing asphalt millings and subbase course; maintaining the temporary pavement; furnishing and placing additional millings to maintain a smooth riding surface; removing and disposing of the asphalt millings and subbase course; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R412.01	Temporary Pavement	Square Foot
R412.02	Temporary Pavement with Subbase	Square Foot
R412.03	Temporary Pavement - Asphalt Milling Pavement	Square Foot
R412.04	Temporary Pavement - Asphalt Milling Pavement with Subbase	Square Foot

SECTION R504 - PORTLAND CEMENT CONCRETE

R504-1 DESCRIPTION

The work shall consist of furnishing portland cement concrete.

R504-2 MATERIALS

R504-2.01 Composition of Mixtures

The portland cement concrete shall consist of a homogenous mixture of cement, fine aggregate, coarse aggregate, water and admixtures proportioned and mixed according to these specifications.

The portland cement concrete used shall be the class of concrete indicated and shall have the following minimum strength classifications:

Class	Minimum 28-day Compressive Strength Pounds per Square Inch
K	3500
L	2000

R504-2.02 Portland Cement

Portland cement shall conform to the requirements of NYSDOT Section 701-01. Type 1 or 2 portland cement may be used, except where otherwise required and approved by the Project Manager.

R504-2.03 Admixtures

Admixtures shall conform to the requirements of NYSDOT Section 711-08.

R504-2.04 Water

Water shall conform to the requirements of NYSDOT Section 712-01.

R504-2.05 Concrete Sand

Concrete sand shall conform to the requirements of NYSDOT Section 703-01, except as modified herein.

When dry, the fine aggregate for portland cement concrete shall conform to the following gradation requirements:

Sieve Size	Percent Passing by Weight
3/8 inch	100
No. 4	95-100
No. 8	80-100
No. 16	50-85
No. 30	25-60
No. 50	10-30
No. 100	2-8

R504-2.06 Coarse Aggregate

Coarse aggregate shall conform to the requirements of NYSDOT Section 703-02, except as modified herein.

Gradation:

Sieve Size	Percent Passing By Weight Type CA 4
1-1/2 inch	100
1 inch	95-100
1/2 inch	25-60
No. 4	0-10
No. 8	0-5

R504-3 CONSTRUCTION DETAILS

R504-3.01 General

Construction details shall conform to the requirements of NYSDOT Section 501-3, except as modified herein.

R504-3.02 Concrete Mixtures

Concrete Class	Cement (Pounds Per CubicYard)	Air Content Percent	Slump Range (Inches)	Type of Coarse Aggregate Gradation	Primary Use
K	564	5-7	2 to 3	CA 4	General Purpose
L	329	3-5	0 to 2	CA 4	Curb Cradle

The criteria are given for design information and the data is based on fine aggregate fineness modulus of between 2.50 and 3.00. The mixture proportions shall be determined using actual conditions for fineness modulus and bulk specific gravities (saturated surface dry for aggregates).

The Contractor, in cooperation with the concrete supplier and as approved by the Project Manager, shall determine the mix proportions for all concrete. The proportions of ingredients shall be such as to produce a mixture which can be satisfactorily placed and consolidated by the methods employed.

R504-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of cubic yards of concrete placed.

R504-5 BASIS OF PAYMENT

The unit price bid per cubic yard shall include the cost of: furnishing and placing portland cement concrete; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R504.01	Class K Concrete	Cubic Yard
R504.02	Class L Concrete	Cubic Yard

SECTION R505 - BRICK PAVEMENT RESTORATION

R505-1 DESCRIPTION

The work shall consist of the restoration of an existing brick pavement to its original section as shown on the plans and as directed by the Project Manager.

R505-2 MATERIALS

R505-2.01 Brick

A. Existing Brick Pavers

Existing brick pavers shall be those either excavated from the site or provided from another location. If existing brick pavers are provided from another location, the brick pavers shall conform in size and color to the existing brick pavers on the street being restored.

B. New Brick Pavers

1. New brick pavers shall be vitrified paving brick, hard, tough, evenly burned, thoroughly annealed, regular in size and shape, and shall conform in size and color to the existing brick pavers on the street being restored. When broken they shall show uniformity of texture and structure and shall be free from open or market laminations. All brick so kiln marked or distorted in burning as to lay unevenly in the pavement shall be rejected.

2. The brick shall have a permanent and reasonably uniform color. The City reserves the right to specify the color of the brick to be used.

3. The paving brick shall conform to the requirements of ASTM C-7 except as modified herein:

Certified copies of test results by an approved laboratory shall be furnished for the brick to be used.

4. Special brick, for hillside grades of 6 percent or over, shall have one or more longitudinal edges or faces chamfered or grooved not more than 3/4 inch.

5. It shall be the right of the City to thoroughly inspect the brick subsequent to delivery at the place of use, and prior to, during or after laying and rolling. The City will reject and require the Contractor to cull out all rejected brick, under the provisions of the Standard Specifications for Paving Brick of ASTM, covered under "Visual Inspection".

6. The brick shall be handled carefully during hauling, unloading and laying, so as to prevent spalling or otherwise damaging the brick. Brick shall be hauled to the site of the improvement and neatly piled outside the roadway until such time, as will best expedite the work without damage to the subbase or base. Precaution shall be taken to prevent mud, dirt or other material from collecting on the brick. Should this occur, the brick shall be cleaned before it is laid in the pavement.

7. The brick shall not be delivered on or adjacent to any improvement on which the brick is to be used until a written statement has been received from the Project Manager, that the brick has been inspected and passed the required tests. Decisions relative to each carload will be made when practicable within 24 hours of notice. Permission to deliver brick on line of work shall not be considered a final inspection in any respect.

R505-2.02 Mortar

Mortar for brick paving shall meet the requirements outlined in NYSDOT Section 705-20, except that the proportion of portland cement NYSDOT Section 701-01, to mortar sand NYSDOT Section 703-03, shall be 1:3 by volume.

R505-2.03 Concrete

Concrete shall be Class C, conforming to the requirements of NYSDOT Section 503.

R505-2.04 Gravel

Gravel shall be Type 1 conforming to the requirements of NYSDOT Section 304.

R505-3 CONSTRUCTION DETAILS

R505-3.01 General

All edges of the existing pavement area to be excavated shall be saw cut before being removed. All saw cuts shall be full depth and shall be made by using a concrete saw only, no other saw shall be allowed to perform this operation.

All existing subgrade material that is determined by the Project Manager to be undesirable, shall be removed and replaced with gravel

A brick pavement surface shall be constructed on top of an 8 inch unreinforced cement concrete base, and a 6 inch gravel subbase.

R505-3.02 Brick Pavement

The brick pavement shall be constructed in conformance with the existing pattern, joints, grade, and crown to match the existing section, to provide a uniformly even surface. No brick pavers shall be laid or grouted in freezing weather. Only full bricks shall be set or replaced.

Brick pavers shall be laid on a 1 inch bed of mortar. Prior to placing the brick pavers, the brick pavers shall be saturated surface dry, and the mortar moistened with water.

A dry mixture of mortar for brick paving shall be swept over the brick pavers until the joints are completely filled. The joints shall be lightly fogged with water. Brick pavers shall be cleaned of excess mortar, and joints finished prior to the mortar setting up. All brick paving shall be kept moist for 4 calendar days after filling the joints with mortar. After the 4 day curing period, removal of remaining mortar film may be accomplished by the use of a light acid wash (10 percent solution of hydrochloric or muriatic acid) followed by flushing clean with water. Care shall be taken to avoid the use of acid in areas where runoff could damage trees or vegetation.

R505-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of square feet of brick pavement restored.

R505-5 BASIS OF PAYMENT

R505-5.01 Brick Pavement Restoration

The unit price bid per square foot shall include the cost of: removing, salvaging, cleaning, and resetting existing brick pavers; installing new brick pavers; excavation including hand excavation; saw cutting; mortar bed; joint filler; unreinforced cement concrete base; gravel subbase; removing, replacing and disposing of undesirable subgrade material; and furnishing all labor, material and equipment necessary to complete the work.

R505-5.02 New Brick Pavers

The unit price bid per square foot shall include the cost of: furnishing new brick pavers to be used for brick pavement restoration.

Payment shall be made under:

ITEM NO.	ITEM	PAY UNIT
R505.01	Restore Existing Brick Pavement	Square Foot
R505.02	New Pavers for Brick Pavement	Square Foot

SECTION R590 - WINDOW WELL

R590-1 DESCRIPTION

The work shall consist of the reconstruction of existing window wells as shown on the plans and as directed by the Project Manager.

R590-2 MATERIALS

Frames and grates shall be Irving Steel close mesh Type CM-1 Steel Grating with bearing bars 3/16 by 1 inch, as manufactured by IKG Industries, or approved equivalent.

Window wells shall be either precast concrete or Class A cast-in-place concrete conforming to NYSDOT Section 555.

Bituminous material for waterproofing the exterior of the window well shall conform with ASTM D41 for asphalt primer and ASTM D449 Type A for hot asphalt. Epoxy materials for waterproofing the interior of the window well shall conform to the specification in NYSDOT Section 717-01.

Reinforcing bars shall conform with NYSDOT Section 709-03 Grade 40.

Gravel shall be subbase course Type 1 conforming to NYSDOT Section 304.

R590-3 CONSTRUCTION DETAILS

Sizes and dimensions of the window well shall be as shown on the detail drawings and as approved by the Project Manager.

R590-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of window wells reconstructed.

R590-5 BASIS OF PAYMENT

The unit price bid per each window well shall include the cost of: removing the existing window well; all excavation and backfill; gravel; Class A concrete; frame and grate; weeps; reinforcing bars; bituminous material; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R590.01	Window Well	Each

SECTION R591 - SIDEWALK HATCH

R591-1 DESCRIPTION

The work shall consist of the installation of a sidewalk hatch over an existing areaway/vault cellar entrance as shown on the plans and as directed by the Project Manager.

R591-2 MATERIALS

Sidewalk hatches shall be of the size and type as indicated on the detail drawings.

R591-3 CONSTRUCTION DETAILS

It shall be the Contractor's responsibility to notify and coordinate the work with the Owner of the structure. The hatch cover shall be installed in accordance the manufacturer's instructions and as approved by the Project Manager. The hatch cover shall be installed on walls constructed to dimensions of the hatch frame. The hatch frame is to be set to the finished sidewalk grade and anchored within the sidewalk pour.

R591-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of sidewalk hatches installed.

R591-5 BASIS OF PAYMENT

The unit price bid per each sidewalk hatch shall include the cost of: furnishing and installing the sidewalk hatch; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R591.01XX	X' x X' Sidewalk Hatch (Street Address)	Each

SECTION R592 - AREAWAY ABANDONMENT

R592-1 DESCRIPTION

The work shall consist of the abandonment of areaways as shown on the plans and as directed by the Project Manager.

R592-2 MATERIALS

Backfill material shall be select structure fill in conformance with the requirements of Section R203.

Concrete for plugging drains and for walls and slabs shall be Class A, in conformance with the requirements of NYSDOT Section 555.

Concrete blocks shall be of the hollow type and shall be in conformance with the requirements of ASTM C90-75, Grade N.

Reinforcing steel shall conform to the requirements of NYSDOT Section 709-01.

Concrete block wall joint reinforcement shall be truss type, standard weight and hot dipped galvanized in accordance with ASTM A153 Class B-2. Material shall be similar and equal to DUR-O-WALL, TRUSS, standard weight.

Concrete grouting material shall conform to the requirements of NYSDOT Section 701-05.

Structural steel for beams shall conform to the requirements of NYSDOT Section 715-01, ASTM A36.

Waterproofing shall conform to the specifications for rapid curing liquid asphalt RC-250, RC-800 with or without additives; or asphalt emulsion RS-2; as designated in NYSDOT Section 702, Material Designations 702-12 thru 702-15 and 702-3101, per Tables 702-3 and 702-5.

Joint material for sealing the formed sidewalk/face of building joint shall be 1" asphalt impregnated filler strip conforming to NYSDOT Section 705.

Expansion joint material used between the top of walls and concrete slabs shall conform to the requirements of NYSDOT Section 705-07.

Waterstop shall be supplied in the shapes as shown on the detail drawings and shall conform to the requirements of NYSDOT Section 705-11.

Water service pipe 2 inches and smaller shall be copper tubing conforming to the requirements of ASTM B88, Type K. Joints shall be flared type. Couplings for connecting new copper tubing to existing pipe shall conform to the material requirements of Section R913.

Water service larger than 2 inches shall be ductile iron pipe Class 52. Couplings for connecting new ductile iron pipe to existing pipe shall be solid sleeve and shall conform to the material requirements of Section R901.

Valves shall be Crane, Ford, Powell, Jenkins, or approved equivalent, solid wedge rising stem gate valves except drain valves which shall be globe type with composition discs, hose ends, caps and chains. Valves shall be properly tagged, with tags fastened on valve stem.

R592-3 CONSTRUCTION DETAILS

R592-3.01 General

It shall be the Contractor's responsibility to notify and coordinate the vault work with the Owner of the vault and utility companies. The sidewalk frame and cover shall be removed and disposed of in accordance with the plans. When work is in progress, the vault opening shall be fenced in or covered to prevent the public from entering the vault, however, access to the building shall be maintained during regular business hours. Care shall be taken not to disturb nearby vaults and utilities that are to remain. Photographs shall be required both before and after construction to protect the interests of all parties involved with this work.

The vault entrance shall be secure at all times and the exposed vault weather tight so as to prevent damage to the vault's contents.

All utilities and equipment shall be protected and maintained in their existing and relocated positions during progression of the work.

Interior frames, supports and debris shall be removed from the vault and dispose of them off the site.

Two sets of colored photographs shall be taken of the existing vault prior to the start of construction. The number of photographs taken shall be adequate to depict both the structural integrity and the overall general condition of the vault. Upon completion of the work, two additional sets of colored photographs shall be taken. The number of photographs taken shall be adequate to depict the work accomplished. One set of each series of photographs shall be given to the Project Manager with remaining set be retained by the Contractor for its personal records.

Field measurements shall be made to verify all dimensions which may affect installation of work, before shop drawings are made or fabrication performed.

All existing load bearing steel which is to remain shall be adequately supported during abandonment and backfill of the areaway. Support methods and practices shall comply with AISC Specifications and Code of Standard Practice.

Shop drawings shall be submitted for the relocation of all utilities to the Project Manager for approval. Proposed relocations are to be coordinated with the appropriate utility company.

Existing drains to be abandoned in place shall be filled and plugged with Class K concrete.

Reinforced concrete or hollow concrete block walls and slabs shall be constructed as required. The outside surface of the completed wall shall receive two coats of waterproofing material. Shop drawings of concrete formwork shall be submitted to the Project Manager for approval, at least 2 weeks prior to pouring the concrete in the forms. Wood or stay-in-place metal forms, properly sized and supported for the expected load may be utilized.

A precast concrete option may be substituted for the cast-in-place concrete structural slabs that are shown on the plans. Design calculations, signed by a Professional Engineer licensed to practice in New York State, shall be submitted to the Project Manager for approval for this option. Shop drawings for the approved precast option shall be submitted to the Project Manager for approval, at least 2 weeks prior to ordering the material to be fabricated.

All walls shall be anchored at the bottom and sides.

Concrete floor slabs shall be broken up with slabs being broken into pieces having an area no greater than 2 feet square with well defined cracks through the full depth of the slab.

The vault walls to be abandoned shall be demolished to a depth of 4 feet below the final ground elevation. The existing cellar walls, columns and beams providing support to the perimeter of the building shall be left undisturbed. The backfill shall be select structure fill meeting the requirements of, and placed in conformance with Section R203.

R592-3.02 Water Services

Water meters shall be relocated from the areaway to inside the main basement wall prior to abandonment of the areaway. Such relocation shall be coordinated with the Owner and the Water Bureau Meter Department.

Furnish and install all piping systems as required. All materials shall be new and free from defects and imperfections. All piping shall be cleaned of pipe cutting oil prior to erection and shall be reamed after cutting to remove burrs and rough edges.

The piping runs for the vaults as shown on the plans are diagrammatic and intended to show the runs, risers, etc., which are required. It is not the intent of the plans to show each offset, which may be required due to job conditions. Install the piping in as close conformance to plans as possible, furnishing any additional offsets, drips, risers, etc., which may be required.

All pipe shall be cut accurately to measurements established at the building, and shall be worked into place without springing or forcing.

All piping to remain shall be properly supported, prior to backfilling of areaway.

R592-3.03 Gas Services

Gas meters shall be relocated by the utility company from the areaway to inside the main basement wall prior to abandonment of the areaway. Such relocation shall be coordinated with the utility company and the Owner.

Necessary piping and reconnection of the gas service to the relocated meter shall be done by the utility company.

All piping to remain shall be properly supported, prior to backfilling of areaway.

R592-3.04 Electric and Telephone Services

The Contractor shall relocate transformers or panels from the areaway to inside the main basement wall prior to abandonment of the areaway. The relocation shall be coordinated with the Owner and the utility companies. Necessary rewiring of the transformers or panels following relocation, shall be done by the utility company.

All piping to remain shall be properly supported, prior to backfilling of areaway.

R592-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be on a lump sum basis for the work completed for each areaway.

R592-5 BASIS OF PAYMENT

The lump sum price bid shall include the cost of: notifying and coordinating the work with the vault Owner and utility companies; preventing the public from entering the vault; weather protection; removing and disposing of debris from the vault; relocating utilities as directed; demolishing vault walls; breaking floor slabs; photographs; furnishing and placing the concrete, steel reinforcement, grout and waterproofing material; backfilling; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R592.01XX	Areaway Abandonment (Street Address)	Lump Sum

SECTION R593 - EXCAVATION OVER EXISTING AREAWAY ROOF

R593-1 DESCRIPTION

The work shall consist of the careful removal of the existing sidewalk or pavement covering existing areaways that are scheduled to remain as shown on the plans and as directed by the Project Manager.

R593-2 MATERIALS

None specified.

R593-3 CONSTRUCTION DETAILS

Photographs shall be required both before and after construction to protect the interests of all parties involved with the work. Prior to any work in the immediate area around the affected areaway, preconstruction inspections shall be conducted. These inspections shall be done initially, and later repeated as follows:

Preconstruction inspections shall be made by qualified specialists retained for this purpose to observe and photograph the condition of existing structure and facilities within the areaway and immediate vicinity. The preconstruction inspections shall include diagrams and colored photographs of all walls, partitions, support beams, columns, floors, ceilings and equipment, showing existing cracks, leakage and structural deficiencies, both major and minor. One copy of the preconstruction inspection report, including one copy of the photographs, all diagrams, drawings and other pertinent information shall be submitted to the Project Manager prior to start of construction. Any damage shall be repaired by the Owner prior to construction.

After the preconstruction inspection, the existing material shall be carefully excavated and removed in areas to the depths as shown on the plans. The method of excavation and equipment to be used shall be reviewed by the Project Manager.

The areaway shall be protected during construction so that it will not become damaged by weather, traffic, vandals or other construction. This shall include adequate covering of the top of the areaway so that storm water does not enter the fill material over the areaway roof, and adequate barriers to keep vehicles off the areaway roof. Construction equipment that would impose a load in excess of 300 pounds per square foot, or wheel load in excess of 2000 pounds, will not be allowed to be on the sidewalk area over an areaway at any time during construction, unless proper shoring of the areaway roof is installed to support the additional load. Approval by the City does not absolve the Contractor's responsibility to protect the areaway from damage and to repair any damage to the areaway which was caused by the Contractor.

The Contractor shall provide and maintain temporary access to all entranceways to the building during the work.

Reinspection of the existing areaway shall be made upon completion of the work and shall adhere to the procedures required for preconstruction inspections. One copy of the reinspection report complete with photographs, diagrams, drawings and other information shall be submitted to the Project Manager.

It is the intent of the City that prior to work on the sidewalk a separate contract will be let either by the City or Owner to construct sufficient additional permanent shoring of the areaway roof steel beams to safely permit the above required live loading and existing dead load to meet or exceed the current Engineering Standards and Procedures for Areaways.

R593-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be on a lump sum basis for the work completed for each areaway.

R593-5 BASIS OF PAYMENT

The lump sum price bid for this item shall include the cost of: excavation and disposal of the existing material; temporary access to all entranceways along the areaway; all inspections, reports, photographs; repairs to the existing areaways if damaged by the construction work; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R593.01XX	Excavation Over Existing Areaway Roof (Street Address)	Lump Sum

SECTION R601 - SEWER LATERAL AND CONNECTION

R601-1 DESCRIPTION

The work shall consist of installing and connecting extra-strength vitrified clay pipe, polyvinyl chloride pipe, and extra-heavy cast iron soil pipe, laterals, and risers as shown on the plans and as directed by the Project Manager.

R601-2 MATERIALS

R601-2.01 Extra-Strength Vitrified Clay Pipe

A. Extra-strength vitrified clay pipe shall conform to the requirements of ASTM C700.

B. Joints for vitrified clay pipe and fittings shall be compression joints conforming to the requirements of ASTM C425.

C. Couplings shall consist of an elastomeric sleeve with shear rings and corrosion resistant tension bands and tightening mechanism and shall conform to the requirements of ASTM C594.

D. Epoxy mortar shall be Sikadur Gel Epoxy Mortar as manufactured by Sika Chemical Corporation, or approved equivalent.

R601-2.02 Polyvinyl Chloride Pipe and Fittings

A. Polyvinyl chloride pipe (PVCP) shall be SDR21 conforming to the requirements of ASTM D2241. All fittings shall conform to the requirements of ASTM D3139 and F477, DWV, Schedule 40.

B. Sealing gaskets shall be molded or extruded, and spliced from a high grade properly vulcanized elastomeric compound, consisting of either a synthetic or natural rubber based polymer and shall conform to the requirements of ASTM F477.

C. Epoxy mortar shall be Sikadur Lo-Mod Gel Epoxy Mortar (Sikastix 360) as manufactured by Sika Chemical Corporation, or approved equivalent.

R601-2.03 Extra-Heavy Cast Iron Soil Pipe

A. Extra-heavy cast iron soil pipe shall conform to the requirements of commercial standard CS-188, extra heavy weight, ASTM A74-75.

B. Cast iron soil pipe for cleanouts shall be 4 inch inside diameter extra-heavy weight, with molten lead and jute joints and shall meet requirements of ASTM A74-75.

C. Joints for cast iron soil pipe shall be push on neoprene gasketed joints conforming to ASTM C564.

R601-2.04 Lateral Markers

Wooden lateral end markers shall be 2 by 4 hemlock stakes.

R601-2.05 Concrete

Concrete shall be Class K conforming to Section R504.

R601-2.06 Stone Bedding

Stone bedding shall conform to Section R203.

R601-2.07 Select Granular Backfill

Select granular backfill shall conform to Section R203.

R601-2.08 Select Backfill

Select backfill material shall be locally excavated material. It shall consist of hard durable materials, free of organic material, debris, excessive clay, frozen material and stone with any dimension greater than 4 inches.

R601-2.09 Surface Restoration Materials

Unless otherwise indicated on the plans and as ordered by the Project Manager, the following materials shall be used:

A. Gravel subbase course shall be Type 1 conforming to the requirements of NYSDOT Section 304.

B. Crushed stone base course shall be Type 2 conforming to the requirements of NYSDOT Section 304.

C. Concrete foundation for pavement shall be Class C conforming to the requirements of NYSDOT Section 503.

D. Asphalt base course shall be Type 1 conforming to the requirements of NYSDOT Section 403.

E. Asphalt binder course shall be Type 3 conforming to the requirements of NYSDOT Section 403.

F. Asphalt wearing surface shall be Type 7F conforming to the requirements of NYSDOT Section 403.

G. Concrete for sidewalks and driveways shall be Class K conforming to the requirements of Section R608.

H. Asphalt for driveways shall conform to the requirements of Section R608.

I. Curbs shall be granite Type A conforming to the requirements of Section R609.

J. Seeding shall conform to the requirements of Section R610.

K. Topsoil shall conform to the requirements of NYSDOT Section 613.

L. Concrete gutters shall conform to the requirements of Section R624.

R601-3 CONSTRUCTION DETAILS

R601-3.01 Sewer Laterals

A. General

Pipe and fittings shall be handled carefully in loading and unloading. They shall be lifted by hoists and lowered on skidways in such a manner as to avoid shock. Derricks, ropes or other suitable equipment shall be used for lowering the pipe into the trench. Pipe and fittings shall not be dropped or dumped.

Pipe shall be stored on a flat surface so the barrel is evenly supported. Pipe should not be stacked higher than 4 feet. For extended storage, pipe shall be covered with an opaque material to shield it from the sun's rays. Bells are to be stacked in opposing directions on alternate rows so they are not supporting the full load.

Pipe and fittings shall be selected so that there will be as small a deviation as possible at the joints and so that inverts present a smooth surface. Pipe and fittings which do not fit together to form a tight joint will be rejected.

Pipe and fittings shall be fitted together and matched so that when laid they will form a sewer with a smooth and uniform invert. The interior of the pipes shall be cleared of all dirt and foreign materials as the work progresses.

Pipe shall be cut with approved power saws which will produce a clean, true cut, free from irregularities, and with a smooth end at right angles to the axis of the pipe. Cut ends shall be beveled.

Joints shall be installed in accordance with the manufacturer's recommendations and as approved by the Project Manager. The Project Manager shall be provided with a copy of the manufacturer's latest instructions for installing joint material at least 2 weeks prior to installation.

B. Installation

Each pipe and fitting shall be inspected before it is lowered into the trench. All pipe shall be laid with ends abutting and true to line and grade with bells upstream, and shall have a full, firm, even bearing. Lateral pipe shall be laid to a minimum grade of 1/4 inch per foot. No length of pipe shall be laid until the previous length has had sufficient backfill material placed and compacted about it to secure it firmly in place to prevent any disturbance. The open ends of pipe shall be securely plugged whenever pipe laying is not in progress. Under no conditions shall pipe be laid in water, and when trench conditions or weather are unsuitable for such work.

Pipe laying shall begin at the sewer main, structure, or other appurtenance. A sufficient number of short lengths of pipe shall be furnished, in order that wyes may be properly placed in the main sewer line for proper alignment of the connection of the lateral to the wye.

Where an existing pipe or cut crosses the trench at an elevation which conflicts with the proposed grade for the new lateral pipe, either the grade for the new lateral pipe shall be changed or the existing pipe shall be relocated. Written approval must be received from the Project Manager before continuing this phase of the work. The new lateral pipe shall have a clearance from the existing pipe of not less than 6 inches. The space between the two pipes shall be solidly filled with compacted sand. Before the trench is refilled, the existing pipe shall be permanently supported.

The trench shall be excavated to the required alignment and depth. Excavation shall conform to the requirements of Section R206. A survey stakeout shall be done at maximum 50 foot intervals to provide grade and alignment control.

Pipe and fittings shall be installed and connected as required. Pipe and fittings shall be installed in accordance with the requirements of ANSI/ASTM C12, according to manufacturer's latest instructions and as approved by the Project Manager. Pipe and fittings shall be handled carefully to guard against damage to the pipe, joints, or exterior and interior coatings.

Appropriate measures shall be taken to prevent dirt, debris and surface water from entering the pipe. Unconnected pipe ends shall be plugged with a watertight plug at the close of each day's work, whenever work is discontinued for any length of time, or when laying conditions indicate that foreign matter may enter the pipe.

Where the trench bottom is determined to be unstable, all unsuitable material shall be removed to a width and depth as ordered by the Project Manager. Unsuitable material shall be disposed of and replaced with an approved material.

When rock is encountered, all rock shall be removed to provide minimum clearance around the pipe exterior of 12 inches along the sides of the pipe and 6 inches along the bottom of the pipe.

Surface water, ground water, mud and other foreign material shall be prevented from entering the existing sewer system during construction, by plugging, pumping, bailing and any other work necessary.

Ends of new pipe or fittings to be connected in the future shall be capped with a plug and marked with a wooden post. The wooden post shall be placed at the ends of all plugged sewer laterals. The marker shall consist of a 12 foot long, 2 by 4 timber placed at the invert of the lateral end to mark its location and depth. The top of the marker shall have the word "SANITARY" for sanitary laterals or "STORM" for storm laterals stenciled on it with green paint. The letters shall be 1-1/2 inches in size. If the end of the lateral is more than 10 feet deep, the length of the 2 by 4 timber marker shall be increased by 4 foot increments until at least 2 feet of the marker is above ground. The exact length of the marker shall be painted on the portion of the marker which extends above finished surface grade.

The ends of all plugged laterals shall be referenced with direct physical ties. The references and invert elevations of the lateral ends shall be filed with the Project Manager.

R601-3.02 Sewer Lateral Risers

A channel of sufficient size shall be excavated and a hole, cored or drilled in the side of the sewer to receive the riser pipe and concrete encasement. A short section of lateral pipe shall be inserted in the tee branch followed by a 45^{o} bend. Straight, vertical pipe followed by either two 45^{o} or three 30^{o} bends shall then be placed to the depth and location required to connect to an existing lateral, or the design invert of a new lateral.

The entire riser from the tee or saddle branch, including the circumference of the existing sewer at the branch, to the end of the upstream bends shall be encased in a 6 inch minimum cover of concrete. Temporary blocking and ties may be used when placing concrete.

R601-3.03 Bedding

A. General

Bedding materials shall be of the type specified, and shall be placed according to the lines and limits indicated on the detail drawings. The lines and limits may be changed by the Project Manager in cases of unusual conditions being encountered at the site. All bedding material shall provide a uniform and continuous support beneath the pipe at all points.

B. Concrete Bedding and Encasement

Pipe to be bedded or encased in concrete shall be placed at proper line and grade on temporary wood or brick supports with wood wedges. Flotation or lateral displacement of the pipe shall be prevented from occurring during concrete placement. Concrete shall be placed uniformly at each side of the pipe in its final position. An approved vibrator shall be used when placing the concrete. Backfilling shall be delayed until concrete has sufficiently set to support backfill placement and load.

C. Stone Bedding

Bedding shall be prepared so that after installation the pipe will be true to line and grade. Bedding shall be compacted prior to pipe installation according to the requirements of Section R203 and shaped to the outside curvature of the pipe. Should full bearing or proper grade or alignment not be achieved, the pipe will be removed and the bedding regraded. Any additional bedding material required shall be compacted and reshaped. Upon installation of the pipe, bedding material shall be placed and compacted at the pipe haunches on each side of the pipe.

D. Existing Material

The suitability of existing material to be used for pipe bedding shall be as approved by the Project Manager. Existing material used as bedding shall be free of organic material, brush, or other debris, and stones larger than 1 inch. Existing bedding shall be shaped to the outside curvature of the pipe prior to installation of the pipe.

R601-3.04 Backfill

The pipe trench shall be backfilled with the materials indicated on the detail drawings. Unless otherwise indicated on the detail drawings, backfill under paved areas shall be select backfill. Select backfill shall be placed according to the requirements of Section R203. When select backfill material is used, it shall be placed according to the requirements of NYSDOT Section 203-3.15, except that lift thickness of the material shall not exceed 8 inches.

R601-3.05 Lateral Connections

A. General

Connections to stubs, ends of existing lateral pipe, or risers shall be made at an existing joint. The existing sewer shall be exposed, existing plugs or covers removed, and the joints prepared for connection by removing all dirt and debris. The existing bell end shall be cleaned and lubricated prior to making the connection. The connection shall be made utilizing the appropriate gaskets, joint materials and fittings. Special connections to existing catch basins, stone box sewers or to laterals requiring couplings shall be per the detail drawings, manufacturer's recommendations and as approved by the Project Manager. No payment shll be made for lateral connections to new catch basin, manholes or sewer branches installed and paid for under the same contract that includes the lateral connections.

B. Lateral Connection to Existing Catch Basin

The side of the existing catch basin shall be exposed. Where an existing lateral pipe is to be replaced, the existing lateral pipe shall be removed, the opening enlarged if necessary, and the new lateral pipe installed. Where a new opening is required in the existing catch basin, the new opening shall be made with a rotary core drill equipped with a diamond bit, and new lateral pipe installed. Existing lateral pipe to be eliminated shall be plugged with a minimum of 12 inches of concrete. All new lateral connections shall be sealed with 100 percent solids epoxy mortar to make a watertight connection.

C. Lateral Connection to Existing Lateral

New lateral pipe shall be connected to the bell ends of existing lateral pipe with elastomeric couplings. The connection shall be made by cutting a length of pipe to fit properly between the existing and new sections. The new lateral pipe shall be field cut to obtain square plain ends at right angles to the line of the pipe. If in the opinion of the Project Manager additional sections of the existing lateral pipe need to be removed to make a proper connection, the required sections shall be removed and additional new lateral pipe installed.

D. Lateral Connection to Existing Stone Box Sewers

The existing sewer shall be exposed. A hole as small as practical shall be made in the existing sewer by removing stones one at a time. The lateral pipe shall be inserted into the hole and the pipe end set flush with the inside wall of the existing sewer. The connection shall be encased with a minimum of 6 inches of concrete.

E. Lateral Connection to Existing Brick Sewers

The existing sewer shall be exposed and a hole cut with a rotary core drill equipped with a diamond bit. The hole shall be made as small as practical to accommodate the lateral pipe. A short bell section of lateral pipe shall be inserted into the opening, and the connection encased with a minimum of 6 inches of concrete.

F. Lateral Connection to Existing Manhole Opening

If the existing opening needs to be enlarged to accommodate the new lateral pipe, the opening shall be enlarged by any method acceptable to the Project Manager. After the new lateral pipe is installed, a tight fit shall be made with an epoxy mortar.

G. Lateral Connection to Existing Manhole

The existing manhole shall be exposed to the depth as required for the connection of the new lateral pipe. A hole in the existing manhole shall be made as small as practical, by any method acceptable to the Project Manager. After the new lateral pipe is installed into the opening, a tight fit shall be made with an epoxy mortar. If required, the connection shall include the installation of an outside drop connection.

R601-3.06 Branch Connections

A. General

New lateral pipe shall be connected to new branches. For new lateral pipe to be connected in the future, plugs shall be installed in the end of the pipe. Wye and tee branches shall be used for the connection of lateral pipe. Only tee or saddle branches shall be used for the connection of lateral riser pipe.

B. Branch Connection to New Sewer

On new vitrified clay tile sewers, new wye or tee branches shall be installed during the installation of the new sewer.

C. Branch Connection to Existing Sewer

On existing sewers, the pipe shall be exposed and new branch fittings installed, or the pipe core drilled, as indicated below.

1. On existing sewers that are less than 2 times the size of the new lateral pipe, a length of the existing pipe shall be removed and a new wye, tee, or vee branch installed. The ends of the existing pipe shall be field cut to obtain a square plain end that is at a right angle to the line of the pipe. Connections shall be made with elastomeric couplings.

2. On existing sewers that are larger than 2 times the size of the new lateral pipe, and on all new or existing reinforced concrete sewers, the existing pipe shall be cut with a rotary core drill equipped with a diamond bit. The hole shall be cored as small as practical to accommodate the tee saddle hub. No other method of cutting an opening will be acceptable. The saddle shall be inserted into the opening, and a tight fit made with 100 percent solids epoxy mortar.

R601-4 METHOD OF MEASUREMENT

R601-4.01 Sewer Laterals

The quantity to be measured for payment shall be the number of linear feet of pipe installed, as measured along the invert of the pipe, including the length placed to the inside face of the catch basin.

R601-4.02 Sewer Lateral Riser

The quantity to be measured for payment shall be the number of linear feet of lateral riser installed, as measured along the invert of the pipe from its connection at a sewer stub, to the end of its last bend.

R601-4.03 Lateral Connections

The quantity to be measured for payment shall be the number of connections actually made.

R601-4.04 Branch Connections

The quantity to be measured for payment shall be the number of new wye, tee, or vee branches, or saddles actually installed.

R601-5 BASIS OF PAYMENT

R601-5.01 General all Items

Excavation, furnishing and placing of stone or concrete bedding, select granular backfill and surface restoration will be paid for under separate items.

All hand or tunnel excavation in and around water lines, gas lines, sewers, steam lines, cable televsion, electric conduit, telegraph conduit, telephone conduit, tree roots, pipe joints, and curbs shall be included in the price bid for excavation.

Sheeting and shoring shall be included in the unit costs bid for excavation unless otherwise indicated in the Contract Documents.

No separate payment will be made for placement of select backfill excavated from the trench. Maintenance of sewage flow, including any necessary pumping or bailing, shall be included in the unit price bid for each item.

R601-5.02 Sewer Laterals

The unit price bid shall include the cost of: furnishing and installing all pipe; bends; pipe fittings; plugs; markers; joint connections to all new branch stubs, laterals and lateral risers; furnishing and installing cleanouts and concrete encasement; and furnishing all labor, material and equipment necessary to complete the work.

Connections to existing catch basins, manholes, sewer pipe, and laterals shall be made under separate bid items.

R601-5.03 Sewer Lateral Risers

The unit price bid shall include the cost of: furnishing and installing all pipe; bends; plugs; markers; concrete encasement; and furnishing all labor, material and equipment necessary to complete the work.

R601-5.04 Lateral Connections

A. Lateral Connection to Existing Catch Basin

The unit price bid shall include the cost of: preparing the existing catch basin for connection; removing existing laterals; plugging existing laterals with concrete; cutting new openings or enlarging existing openings for new laterals; making the actual lateral connections; any required pipe cutting; sealing new connections; furnishing and placing all concrete and epoxy mortar; repairing catch basins damaged during the work; and furnishing all labor, material and equipment necessary to complete the work.

B. Lateral Connection to Existing Lateral

The unit price bid shall include the cost of: preparing the existing pipe for connection; cutting the existing pipe for proper fit; furnishing and installing an elastomeric coupling; making the necessary joint; and furnishing all labor, material and equipment necessary to complete the work.

C. Lateral Connection to Existing Stone Box/Brick Sewer

The unit price bid shall include the cost of: preparing the existing sewer for connection; making a hole in the existing sewer; making the actual lateral connection; any required pipe cutting; sealing and encasing the connection; furnishing and placing all concrete and epoxy mortar; repairing any portions of the sewer damaged during the work; and furnishing all labor, material and equipment necessary to complete the work.

D. Lateral Connection to Existing Manhole Opening

The unit price bid shall include the cost of: preparing the existing manhole for connection; removing existing laterals; plugging existing laterals with concrete; enlarging existing opening for new lateral; making actual lateral connection; any pipe cutting; sealing new connection; furnishing and placing all concrete and epoxy mortar; repairing manhole damaged during work; and furnishing all labor, material and equipment necessary to complete the work.

E. Lateral Connection to Existing Manhole

The unit price bid for each connection shall include the cost of: making the opening in the existing manhole; the actual lateral pipe connection, including outside drop connection if required; any pipe cutting; sealing the connection; furnishing and placing all concrete and epoxy mortar; repairing manhole damaged during work; and furnishing all labor, material and equipment necessary to complete the work.

R601-5.05 Branch Connections

A. General

The unit price bid shall include the cost of: furnishing and installing a new branch or saddle hub; required plugs; and furnishing all labor, material and equipment necessary to complete the work.

B. Branches at Existing Sewers

The unit price bid shall include the cost of: preparing and cutting the existing sewer; maintenance of sewage flows; furnishing and installing elastomeric couplings; and replacing any portion of the existing sewer damaged during the work.

C. Saddle Branches

The unit price bid shall include the cost of: preparing the existing sewer; maintenance of sewage flows; coring a hole in the existing sewer; installing and sealing the saddle; furnishing and placing epoxy mortar; and repairing and replacing any portion of the sewer damaged during the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R601.01XX	X" Extra-Strength Vitrified Clay Pipe	Linear Foot
R601.02XX	X" Polyvinyl Chloride Pipe, SDR21	Linear Foot

ITEM NO.	ITEM	PAY UNIT
R601.03XX	X" Extra-Heavy Cast Iron Soil Pipe	Linear Foot
R601.04XX	X" Extra-Strength Vitrified Clay Riser Pipe	Linear Foot
R601.05XX	X" Polyvinyl Chloride Riser Pipe, SDR21	Linear Foot
R601.06XX	X" Extra-Heavy Cast Iron Soil Riser Pipe	Linear Foot
R601.07	Lateral Connection to Existing Catch Basin	Each
R601.08	Lateral Connection to Existing Lateral	Each
R601.09	Lateral Connection to Existing Stone Box Sewer	Each
R601.10	Lateral Connection to Existing Brick Sewer	Each
R601.11	Lateral Connection to Existing Manhole Opening	Each
R601.12	Lateral Connection to Existing Manhole	Each
R601.13	Lateral Connection to Existing Manhole, Including Outside Drop Connection	Each
R601.14XX	X" x X" Extra-Strength Vitrified Clay Branch at Existing Sewer	Each
R601.15XX	X" x X" Extra-Strength Polyvinyl Chloride Branch at Existing Sewer	Each
R601.16XX	X" x X" Extra-Strength Extra-Heavy Cast Iron Branch at Existing Sewer	Each
R601.17XX	X" x X" x X" Extra-StrengthVitrified Clay Double-Branch at Existing Sewer	Each
R601.18XX	X" x X" x X" Polyvinyl Chloride Double-Branch at Existing Sewer	Each
R601.19XX	X" Extra-Strength Vitrified Clay Saddle Branch	Each
R601.20XX	X" Polyvinyl Chloride Saddle Branch	Each
R601.21XX	X" Extra-Heavy Cast Iron Saddle Branch	Each

SECTION R604 - CATCH BASIN AND MANHOLE

R604-1 DESCRIPTION

The work shall consist of the construction or alteration of catch basins and manholes as shown on the plans and as directed by the Project Manager.

R604-2 MATERIALS

R604-2.01 General

A. Bar Reinforcement

Bar reinforcement shall be in conformance with NYSDOT Section 709-01.

B. Brick

Brick shall be first quality, sound, hard-burned common brick conforming to ASTM Designation C32, manhole brick, grade MS (for grade adjustment) and sewer brick, grade SS (for inverts and benches). Brick shall be culled of all irregulars and unsound or damaged brick before laying.

C. Crushed Stone

Crushed stone shall be Type 2 in conformance with NYSDOT Section 304.

D. Dampproofing

1. Exterior dampproofing shall be two coats of Hi-Build Bituminous Coating 35-J-10 as manufactured by Mobil Corporation or Bitumastic Super Service Black as manufactured by Koppers Company, Inc., or approved equivalent.

2. Interior dampproofing shall be two coats of Sikagard 62 as manufactured by Sika Corporation or Duralkote 312 as manufactured by Dural International Corporation, or approved equivalent.

E. Grout

Grout shall be nonshrink type grout in conformance with NYSDOT Section 701-05. Grout shall have a minimum compressive strength of 4,000 pounds per square inch at 24 hours.

F. Joint Compound

Joint compound shall be Mainstay Joint Compound, Sikaflex-1A, Sonolastic NPII as manufactured by Sonneborn or approved equivalent.

G. Mortar

Portland cement mortar shall be in conformance with ASTM Designation C270, Type M, mortar for unit masonry.

H. Select Granular Backfill

Select granular backfill shall be in conformance with Section R203.

R604-2.02 Type A or B Catch Basin

A. Precast

Precast concrete units shall be in conformance with NYSDOT Section 706-04.

B. Cast-in-Place

Cast-in-place concrete units shall be Class A in conformance with NYSDOT Section 555.

C. Frames and Grates

Frames and grates shall be in conformance with Section R655.

R604-2.03 Type C Catch Basin

A. General

Catch basin shall come complete with hood type trap, frame and grate.

B. Precast

Precast concrete units shall be in conformance with NYSDOT Section 706-04.

C. Cast-in-Place

Cast-in-place concrete units shall be constructed of Class A reinforced concrete in conformance with NYSDOT Section 555.

D. Frame and Grate

Frame and grate shall be Neenah R-3433 as manufactured by Neenah Foundry Company, or approved equivalent.

E. Trap

Cast iron catch basin traps shall be Neenah R-3701 as manufactured by Neenah Foundry Company, or approved equivalent.

R604-2.04 Adjustment of Existing Capstone Catch Basins

Concrete for new cap shall be Class A in conformance with NYSDOT Section 555.

R604-2.05 Adjustment of Manholes

Concrete for encasement shall be Class A in conformance with NYSDOT Section 555.

R604-3 CONSTRUCTION DETAILS

R604-3.01 General

A. Shop Drawings

Manufacturer's shop drawings are to be submitted as required in the General Conditions Article 6, Section 6.13.

B. Excavation

Excavation shall be performed in accordance with the requirements of Section R206.

C. Select Granular Backfill

No structure shall be backfilled until all of the mortar has completely set. Select granular backfill shall be placed in accordance with the requirements of Section R203.

D. Pipe Installations

All pipe built into the walls of the structure shall be flush with the inside face of the wall and shall project outside a sufficient distance to allow for proper connection with the adjoining pipe section. The masonry shall fit neatly and tightly around the pipe and shall be properly sealed.

R604-3.02 Catch Basins

A. General

When adjustment of existing structures to proper grade is specified, the frames, covers, and gratings, shall be removed and the walls reconstructed as required. The cleaned frames shall be reset at the required elevation. Upon completion, each structure shall be cleaned of any accumulation of silt, debris, or foreign matter of any kind and shall be kept clear of such accumulation until final acceptance of the work. Where a new catch basin is being connected to an existing lateral, the existing lateral shall be cleaned of all extraneous debris to the main sewer. Prior to ordering precast catch basin units, verify the required invert elevation of the catch basin, size and direction of lateral and underdrain pipes.

B. Dampproofing

Dampproofing materials shall be delivered to the site in the manufacturer's sealed containers, clearly marked with name of the product. Application methods and temperature shall be in accordance with the written recommendations of the manufacturer and as approved by the Project Manager. All exterior and interior surfaces including the bottom shall receive two coats of dampproofing material prior to installation.

C. Adjustment of Existing Capstone Catch Basins

The existing pavement shall be excavated 1 foot 6 inches outside the edge of the basin walls, capstone shall be removed and disposed of. The catch basin walls shall be hand removed to accommodate a full length of 16 inch deep curbing and reinforced Class A concrete lintel. The work to repair the existing walls shall be consistent with the original construction. The lintel shall be formed, with all forming being removed from within the catch basin.

D. Relocation of Existing Catch Basins

The catch basin shall be carefully excavated, removed and reinstalled in its new location.

E. Cleaning Existing Catch Basins and Laterals

The catch basins and laterals shall be cleaned to the main sewer of all extraneous debris in a workmanlike manner and maintained clean for the duration of the contract. Materials removed shall be promptly disposed of.

R604-3.03 Adjustment of Manholes

The manhole castings shall be removed and cleaned of all existing extraneous material. Brick and mortar leveling courses shall be constructed to accommodate the new finish grade. The casting and new brick adjustment shall be encased within a minimum 8 inch thick concrete. This encasement shall extend a minimum of 12 inches outside the existing casting with the top of the concrete encasement being 3-1/2 inches below finish grade.

R604-4 METHOD OF MEASUREMENT

R604-4.01 Catch Basins

The quantity to be measured for payment shall be the number of catch basins constructed, up to a depth of 6.0 feet. Depth of catch basin will be measured as the distance between the invert elevation of the lateral pipe and the elevation of the top of grate.

R604-4.02 Additional Depth of Catch Basins

The quantity to be measured for payment shall be the number of linear feet of depth measured to the nearest tenth of a foot that exceeds 6.0 feet, measured as specified in R604-4.01.

R604-4.03 Adjustment of Existing Catch Basins

The quantity to be measured for payment shall be the number of catch basins adjusted.

R604-4.04 Relocation of Catch Basin

The quantity to be measured for payment shall be the number of catch basins relocated.

R604-4.05 Cleaning Existing Catch Basins and Laterals

The quantity to be measured for payment shall be the number of existing catch basins, including all connecting laterals, cleaned.

R604-4.06 Adjustment of Manholes

The quantity to be measured for payment shall be the number of manholes adjusted.

R604-5 BASIS OF PAYMENT

R604-5.01 Catch Basins

The unit price bid shall include the cost of: furnishing and installing precast or cast-in-place units; coring additional openings into precast basins; connecting lateral pipe to the catch basin; interior and exterior coatings; bar reinforcement; leveling course; frames and grates; concrete; mortar; epoxy grout; cleaning existing lateral; disposing all debris; and furnishing all labor, material and equipment necessary to complete the work.

A. Type C Catch Basin

The unit price bid shall also include the cost of furnishing and installing hood trap.

B. Relocation of Catch Basins

The unit price bid shall also include the cost of removing and reinstalling catch basin, frame and grate; cleaning existing catch basin and lateral; disposing all debris.

Replacement of broken frames, covers and grates shall be paid separately under Section R655.

C. Excavation and Backfill

Excavation and backfill will be paid for separately under their appropriate items in Sections R203 and R206.

R604-5.02 Adjustment of Existing Catch Basins

The unit price bid shall include the cost of: removal and resetting existing frame and grate; cleaning existing catch basin and lateral; disposing all debris; excavation and backfill; and furnishing all labor, material and equipment necessary to complete the work.

Replacement of broken frames, covers and grates shall be paid for separately under Section R655.

R604-5.03 Adjustment of Existing Capstone Catch Basins

The unit price bid per shall include the cost of: removing and disposing capstone; removing and resetting existing frame and grate; concrete; forming concrete lintel; masonry; repairing catch basin walls; steel reinforcement; cleaning existing catch basin and lateral; disposing all debris; excavation and backfill; and furnishing all labor, material and equipment necessary to complete the work.

R604-5.04 Cleaning Existing Catch Basins and Laterals

The unit price bid shall include the cost of: cleaning existing catch basin and lateral; disposing all debris; furnishing all labor, material and equipment necessary to complete the work.

R604-5.05 Adjustment of Manholes

The unit price paid per each manhole adjustment shall include the cost of: removing and resetting existing frame and cover; concrete encasement; masonry; excavation; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R604.11	Type A Catch Basin	Each
R604.12	Type B Catch Basin	Each
R604.13	Type C Catch Basin	Each
R604.14	Additional Depth Type A Catch Basin	Linear Foot
R604.15	Additional Depth Type B Catch Basin	Linear Foot
R604.16	Additional Depth Type C Catch Basin	Linear Foot
R604.17	Adjust Existing Catch Basin Frame and Grate	Each
R604.18	Adjust Existing Capstone Catch Basin Frame and Grate	Each
R604.19	Relocate Existing Catch Basin	Each
R604.20	Clean Existing Catch Basin and Lateral	Each
R604.21	Adjust Existing Manhole Frame and Cover	Each

SECTION R605 - UNDERDRAIN

R605-1 DESCRIPTION

The work shall consist of constructing underdrain installations in conformity with the lines, grades, and cross sections shown on the plans and as directed by the Project Manager.

R605-2 MATERIALS

R605-2.01 Underdrain Pipe

Underdrain pipe shall be 6 inch corrugated polyethylene and shall conform to the heavy duty requirements of AASHTO M252, Plastic and Polyethylene Corrugated Drainage Pipe or Tubing, except as follows:

A. Underdrain shall be black heavy duty corrugated polyethylene.

B. Underdrain shall have slotted or knifed perforations uniformly spaced along the length and circumference. Slots shall be cleanly cut with no extraneous materials or webs remaining in the perforations.

C. Minimum pipe stiffness at 5 percent and 10 percent deflection at 73°F +/- 4°F shall be 35 pounds/inch/inch and 30 pounds/inch/inch, respectively.

D. Screw, split, or snap fittings shall be used.

E. Straight lengths of pipe shall be furnished with a minimum nominal length of 20 feet. Coiled pipe may be substituted for straight pipe, only in those areas where it would be more appropriate and as approved by the Project Manager.

R605-2.02 Underdrain Filter Material

Underdrain filter material shall consist of crushed stone or pea gravel, meeting the gradation requirements of this specification. Material and gradation tests and quality control methods pertaining to the item requirements and work of this section will be performed as ordered by the Project Manager.

Underdrain filter material shall be stockpiled and approved by the Project Manager prior to installation.

Gradation:

Sieve Size	Percent Passing By Weight
1 inch	100
1/2 inch	30-100
1/4 inch	0-30
No. 10	0-10
No. 20	0-5

The soundness of material meeting the requirement of NYSDOT Sections 703-02, Coarse Aggregates or 703-10, Lightweight Aggregates, is acceptable for underdrain filter material. When electing to use material from sources not approved under NYSDOT Sections 703-02 or 703-10, the soundness of the material shall be tested, and shall not have a loss exceeding 20 percent by weight after four cycles of the Magnesium Sulphate Soundness Test.

R605-3 CONSTRUCTION DETAILS

R605-3.01 Underdrain Pipe

A. General

The construction details of Section R601 shall apply. A carefully leveled and compacted bed of underdrain filter material shall be prepared just prior to the placement of the underdrain pipe. Filter material shall be approved by the Project Manager prior to the placement of any pipe. The subgrade surface will be checked prior to pipe installation to insure that it is pitched toward the pipe. The upgrade end of underdrain pipe runs shall be closed with a suitable plug. The underdrain pipe shall be placed with perforations down.

Sections of pipe shall be joined only with approved fittings and the pipe shall not be split to widen it to join sections. If vertical alignment cannot be maintained, lengths of pipe shall be cut and secured with Project Manager approved couplings.

B. Storage And Handling

Storage and handling precautions of AASHTO 252 are reiterated as follows:

Polyethylene may deteriorate from prolonged exposure to ultraviolet radiation. Deterioration in storage may be evidenced by brittleness, cracking or splitting. For extended storage, pipe shall be kept out of direct sunlight or be covered with an opaque material to shield it from sunlight.

Polyethylene will melt and burn when exposed to flame. Flame damaged portions shall not be used.

Pipe damaged by deterioration, crushing or stretching shall not be used.

Extra care must be used in handling in cold weather. Prior to placement, the pipe shall be stored for at least 24 hours in an area having a minimum temperature of 50°F.

R605-3.02 Underdrain Filter Material

After the pipe installation has been inspected and approved, underdrain filter material shall be loosely placed around and over the pipe to such a depth that, after compaction, underdrain filter material will extend to a level 4 inches above the underdrain pipe. Subsequent lifts of underdrain filter material shall be no more than 6 inches thick prior to compaction, and shall be compacted by two passes of a Project Manager approved vibrating pad or drum type compactor.

In the event that a pipe is not included in the installation, the filter material shall be placed in horizontal layers not exceeding 6 inches in thickness prior to compacting. Each lift shall be compacted by two passes of a Project Manager approved vibrating pad or drum type compactor.

R605-3.03 Underdrain Filter Material at Structures

Underdrain filter material shall be placed adjacent to structures as specified on the plans. The lift thickness for the loose material shall not exceed 6 inches and shall precede the placement of each lift of the adjacent backfill material. A physical barrier may be used to facilitate placement of the underdrain filter material and adjacent backfill. This barrier shall not be left in place and shall be removed prior to compaction of the material. Each lift of the filter material and backfill material located within a minimum distance of 3 feet from the backwall plus the footing heel projection shall be compacted simultaneously. Compactive effort for this material shall be provided by two passes of a vibratory compactor. Placement and compaction operations shall be conducted in a manner so as to insure that the top surface of each lift of filter material shall not be contaminated by the adjacent backfill materials.

R605-4 METHOD OF MEASUREMENT

R605-4.01 Underdrain Pipe

The quantity to be measured for payment shall be the number of linear feet of pipe installed.

R605-4.02 Underdrain Filter Material

The quantity to be measured for payment shall be the number of cubic yards of filter material installed.

R605-5 BASIS OF PAYMENT

R605-5.01 General all Items

No payment will be made for any losses of material which may result from compaction, foundation settlement, erosion, or any other causes; the cost of such losses shall be included in the unit price bid for these items. All contaminated underdrain filter material shall be replaced.

R605-5.02 Underdrain Pipe

The unit price bid per linear foot shall include the cost of: furnishing and installing underdrain pipe; furnishing and placing filter material; connections to catch basins, manholes and existing underdrain pipe; plugging unconnected ends of underdrain pipe; excavation; and furnishing all labor, material and equipment necessary to complete the work.

R605-5.03 Underdrain Filter Material

Payment under this item will be made only in those areas where a filter material is installed without an underdrain pipe.

The unit price bid per cubic yard shall include the cost of: furnishing and placing filter material; excavation; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R605.12	6" Corrugated Polyethylene Underdrain Pipe	Linear Foot
R605.13	Underdrain Filter Material	Cubic Yard

SECTION R607 - FENCING

R607-1 DESCRIPTION

The work shall consist of furnishing and erecting fencing and fence gates in reasonable close conformity with the location, lines and grades shown on the plans and as directed by the Project Manager.

R607-2 MATERIALS

R607-2.01 Galvanized Chain Link Fence

The materials shall conform to the requirements specified in the following subsections of NYSDOT Section 700:

Galvanized Steel Fence Fabric	710-02
Steel and Iron Post, Rails, Braces and Fittings for Chain Link Fence	710-10.03

Gate frames shall be composed of tubing braced with rods, bars or angles and filled with wire mesh meeting the requirements of the specifications for the type of fencing with which the gate is to be used. The use of reconditioned materials will not be permitted.

R607-2.02 Slats

Slats shall be heavy duty polyvinyl, commercial 2 inch width for installation in 2 inch mesh chain link. Color shall be as specified. Slats shall be Type A-9 as manufactured by PDS Division of A & B Plastics, Inc., or approved equivalent.

R607-2.03 Stockade Fence

Fencing and posts shall be of white cedar and in length as normally supplied for stockade fencing by the manufacturer. Portions of posts installed below grade shall be treated with a wood preservative as specified on the detail drawings, conforming to the requirements of the American Wood Preservers Association (AWPA).

R607-2.04 Concrete

Concrete shall be Class K conforming to Section R504.

R607-3 CONSTRUCTION DETAILS

R607-3.01 General

Prior to any fence installation, a utility stake out shall be done to avoid conflict with underground utilities.

Clearing and grubbing shall be done as necessary to construct the fence to the required grade and alignment.

At locations where breaks in a run of fencing are required, or at intersections with existing fences, appropriate adjustment in post spacing shall be made to conform with the requirements for the type of closure indicated.

When the detail drawings require that the posts, braces, or anchors be imbedded in concrete, temporary guys or braces shall be installed as may be required to hold the posts in proper position until such time as the concrete has set sufficiently to hold the posts. Unless otherwise permitted by the Project Manager, no materials shall be installed on posts or strain placed on guys and bracing set in concrete until 7 calendar days have elapsed from the time of placing the concrete.

All posts shall be set vertically and to the required grade and alignment. Cutting of the tops of the posts will be allowed only with the approval of the Project Manager.

Wire or fencing of the size and type required shall be firmly attached to the posts and braces in the manner indicated. All wire shall be stretched taut and installed to the required elevations.

At each location where an electric transmission, distribution or secondary line crosses any of the types of fences covered by these specifications, a ground conforming to the requirements of Subsection 9 of the National Electric Safety Code shall be installed.

Fence shall generally follow the contour of the ground, with the bottom of fence fabric 4 to 6 inches above the ground surface. Grading shall be performed where necessary to provide a neat appearance.

Line posts shall be spaced equidistant in the fence line. End, corner, and intermediate posts shall be placed at the locations indicated and shall be braced. When chain link fence is on a long curve, intermediate posts shall be evenly spaced so that the strain of the fence will not bend the line posts.

All end, corner, and intermediate posts shall be set plumb in concrete bases. The concrete bases shall be rough cast in the ground around the posts. The top surfaces shall be domed to shed water and provide a neat workmanlike appearance when completed.

R607-3.02 Chain Link Fence

A. General

Posts shall be set 8 to 10 feet on center so they are equidistant. All top rails shall pass through the base of the post caps and shall form a continuous brace from end to end of each stretch of fence. Top rail lengths shall be joined with sleeve couplingsand shall have expansion sleeves provided at 100 foot intervals. Top rails shall be securely fastened to end posts by means of approved rail end connectors. Horizontal braces shall be provided at all intermediate posts, midway between the top rail and ground. Diagonal truss rods shall be installed with horizontal braces.

Fence fabric shall be installed approximately 4 inches +/- 1 inch above the ground level and securely fastened along the bottom, and to all braces, top rails, line and pull posts. The fabric shall be secured to all end, corner and gate posts with stretcher bars fastened to the posts, with stretcher bands spaced at a maximum of 1 foot 2 inches and in a manner permitting adjustment of the fabric tension. Fence fabric ties shall be double looped.

If the option of using one piece roll-formed sections is used, the fence fabric shall be integrally woven into the fabric loops on the end, corner, pull and gate posts. The fabric shall be attached to the top braces and line posts.

B. Fence Gates

Metal fence gates shall be constructed of the type and size as indicated on the detail drawings, and in the location shown on the plans.

C. Slats

P.D.S. slats shall be installed according to manufacturer's recommendations and as approved by the Project Manager. Holding channels shall be included in installation. Tack each slat with a metal clip.

R607-3.03 Relocate Existing Fence

The existing fence and posts shall be removed in such a manner that the existing materials are not damaged. Any materials determined by the Project Manager not to be reusable, shall be replaced in kind. The existing posts shall be reset in a concrete base.

R607-3.04 Stockade Fence

Stockade fence shall be located as indicated on the plans and erected plumb, and true in line and grade with posts set a minimum of 3 feet into the ground and backfilled with 6 inches all around of Class K concrete.

R607-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of linear feet of fence installed, as measured along the top of the fence, center to center of end posts. An allowance of 10 linear feet will be added for each end post, corner post and pull post installed.

R607-5 BASIS OF PAYMENT

R607-5.01 Fence - General

The unit price bid per linear foot shall include the cost of: furnishing and installing fence and fence gates; concrete; anchoring; posts; hardware; clearing, grubbing, excavation, backfill, and disposal; and furnishing all labor, material and equipment necessary to complete the work.

R607-5.02 Chain Link Fence with P.D.S. Slats

The unit price bid per shall also include the cost of furnishing and installing P.D.S. slats.

R607-5.03 Relocate Existing Fence

The unit price bid per linear foot shall include the cost of: removing and resetting existing posts and fence; repair or replacement of existing material; clearing, grubbing, excavation, backfill, and disposal; concrete; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R607.21	4' Chain Link Fence	Linear Foot
R607.22	6' Chain Link Fence	Linear Foot
R607.23	8' Chain Link Fence	Linear Foot
R607.24	4' Chain Link Fence w/ P.D.S. Slats	Linear Foot
R607.25	6' Chain Link Fence w/ P.D.S. Slats	Linear Foot
R607.26	8' Chain Link Fence w/ P.D.S. Slats	Linear Foot
R607.27	Relocate Existing Chain Link Fence	Linear Foot
R607.28	Relocate Existing Wood Fence	Linear Foot
R607.29	Relocate Existing Wire Fence	Linear Foot
R607.30	4' Stockade Fence	Linear Foot
R607.31	6' Stockade Fence	Linear Foot

SECTION R608 - SIDEWALK AND DRIVEWAY

R608-1 DESCRIPTION

The work shall consist of the construction of a concrete, asphalt or brick sidewalk or driveway; and resetting or salvaging of stone sidewalk, in close conformance with the lines and grades as shown on the plans and as directed by the Project Manager.

R608-2 MATERIALS

R608-2.01 General

Materials shall meet the requirements specified in the following subsections of NYSDOT Section 700:

Portland Cement	701-01
Bituminous Materials (as specified)	702-00
Asphalt Cement for Paving	702-0200 or 702-0300
Fine Aggregates	703-01
Coarse Aggregates	703-02
Mortar Sand	703-03
Mineral Filler	703-08
Premoulded Resilient Joint Filler	705-07
Mortar for Stone Curbs	705-20
Water	712-01

R608-2.02 Concrete

Concrete shall be Class K in conformance with Section R504.

R608-2.03 Brick

Brick pavers shall be of the type as shown on the detail drawings and shall meet the requirements of NYSDOT Section 704-08.

Mortar shall meet the requirements as outlined in NYSDOT Section 705-20, except that the proportion of portland cement to mortar sand shall be 1:3 by volume.

R608-2.04 Asphalt

A. Asphalt Top

Asphalt top shall be an asphalt mix that is dense graded and having a gritty texture for single course resurfacing over an existing stone base or asphalt binder.

Requirements of NYSDOT Section 401 shall be met except for the following modifications:

Composition Of Bituminous Plant Materials

Screen Size	General Limits Percent Passing	Job Mix Tolerance Percent
1/2 inch	100	--
1/4 inch	90-100	--
1/8 inch	45-70	+/- 7.0
No. 20	15-40	+/- 7.0
No. 40	8-27	+/- 7.0
No. 80	4-16	+/- 4.0
No. 200	2-6	+/- 2.0
Asphalt Content Percentage	6.0-8.0	+/- 0.4
Asphalt Cement Grade and Number	AC-20 702.0500	
Mixing and Placing Temperature Range °F:	250-325	

Aggregate shall be a material conforming to the requirements of NYSDOT Sections 703-01 and 703-02, and shall meet the following blend percentages:

Aggregates		Aggregate Blend Percent
COARSE:	#1A	44
FINE:	Manufactured	28
	Natural	28

B. Asphalt Binder

Asphalt binder shall be Type 3, and shall meet the requirements of NYSDOT Section 401-2.

R608-2.05 Gravel

Gravel shall be subbase course Type 1 conforming to NYSDOT Section 304.

R608-2.06 Crushed Stone

Crushed stone shall be subbase course Type 2 conforming to NYSDOT Section 304.

R608-3 CONSTRUCTION DETAILS

R608-3.01 Concrete Sidewalk and Driveway

A. General

The general construction details for manufacturing, transporting, and placing concrete shall meet the requirements of NYSDOT Section 501 and Section R504.

Walks shall be constructed to a minimum of 5 inches in thickness (7 inches for driveways) and shall be constructed generally to a 5 foot width, or to a width as indicated on the plans.

B. Excavation and Backfill

The area on which the walk is to be constructed shall be excavated and the subgrade shall be shaped to a relatively smooth surface and all hardspots and softspots eliminated in order to provide uniform support for the new slab.

Subgrade material shall be free of large stones, tree roots, or any other foreign substances and be thoroughly compacted.

The excavation shall include the removal and disposal of existing sidewalks, tree roots where applicable, earth and all other material encountered in the excavation for the proposed walk. It shall also include the painting of the ends of cut roots, over 1 inch in diameter, with an approved asphaltic paint. The tree roots shall be cut off at least 6 inches outside and below the subgrade limits of the walk.

In excavating and removing an existing walk, care shall be taken so as to cause no damage to other adjacent sidewalk that is to remain. As a necessary precaution, the existing walk shall be cut at false joints or other areas with a concrete saw so not to damage adjacent sidewalk.

Where grade adjustments dictate, gravel fill shall be used to adjust subgrade elevations and to replace unsuitable subgrade material. The gravel fill shall be thoroughly compacted and wetted prior to walk installation.

C. Forms

Forms shall be free from warp and have sufficient strength to resist springing out of shape. All forms shall be a minimum of 5 inches in depth and wood forms shall have a nominal thickness of 2 inches. All mortar, dirt or other extraneous material will be removed from forms before they are used. The forms shall be well staked or otherwise held to the established lines and the upper edges shall conform to the established grade of the walk. All wood forms shall be thoroughly wetted and all steel forms shall be oiled before any concrete is deposited against them. Where walks cross asphalt drives, forms shall be carried through the drives leaving a uniform width concrete walk.

D. Joints

Joints and edges shall be finished with an approved jointing tool having a minimum 5/8 inch radius so made as to slightly round the ends of the joint. Premoulded expansion joint material, 1/2 inch in thickness, of approved material and quality, shall be provided at least once in every 30 feet of continuous walk, and shall extend for the full thickness and width of the walk. When the length of sidewalk is at least 15 feet, but less than 30 feet, one piece of joint material shall be placed. Where less than a 15 foot length of sidewalk is installed, the expansion strip is not necessary. Expansion joints shall not protrude above finish grade.

E. Valve Boxes, Monument Covers and Handholes

Valve boxes, monument covers, handholes or other appurtenances found within a sidewalk slab will be reset to grade before any concrete is placed. All valves, monument covers, handholes or other appurtenances covered by the concrete, will be uncovered and cleaned and the surrounding area repaired and restored.

F. Concrete Placement

Upon placement of the concrete, the wet mix shall be struck off level with the tops of the forms and bull floated to eliminate the high and low spots and force large particles back from the surface in such a manner as to prevent sealing of the surface. Edging and contraction joints shall then be fashioned.

The concrete surface shall be scored at intervals of 3 to 5 feet so that the finished walk will be marked in squares. Scoring shall be 1/4 inch wide and at least 1/4 the thickness of concrete.

After waiting until normal "bleeding" has ceased, all excess water shall be removed from the surface of the newly placed concrete before floating with an aluminum or magnesium float. The surface shall then be sealed by steel troweling and reedged and rejointed. The surface shall be lightly broomed transversely, with care taken to eliminate the markings left by the edging tool. Curing procedures shall begin immediately upon final finishing of surface.

G. Curing

The concrete shall be cured immediately by the application of West Concrete Floor Treatment as manufactured by West Chemical Products, Inc., or Penetryn Co.; or Resiweld Bonding Compound #69 as manufactured by the H.B. Fuller Co.; or approved equivalent. The compound shall be applied in accordance with the manufacturer's latest instructions and as approved by the Project Manager.

In lieu of chemical curing agents, the newly placed concrete shall be immediately covered by 6 mil plastic or kraft paper tarps. These covers shall completely cover the newly poured area and shall be securely anchored and remain in place for at least 3 calendar days.

H. Barricades

All open excavations and newly poured concrete areas shall be barricaded so as to prevent accidental intrusion into these construction areas. Only barricades totally blocking the construction areas will be acceptable (saw horse type). Unacceptable for use as barricades are barrels, post top mounted flashers or any other similar devices.

I. Restoration

When restoring lawn area adjacent to new construction, on-site burrow material may be used which is free of grass clumps, tree roots, pieces of asphalt, and stones larger than 2 inches in size. All topsoil and burrow material placed shall be compacted by a hand tamper, or other approved means, so that no settling occurs. If settling occurs, the settled area shall be filled and reseeded.

When adjacent asphalt surfaced areas are disturbed as part of the sidewalk construction, they shall be repaired. Generally, compacted stone backfil, per NYSDOT Section 304, to within 2 inches of finished grade is acceptable before placement of a minimum 2 inch asphalt top per section R608-3.03. Cold patch shall not be used. All lines shall be straight and true and all work shall be done in a satisfactory manner.

R608-3.02 Sidewalk Ramps

Sidewalk ramps shall be provided at all curbed intersections and midblock crosswalks, where shown on the plans. All new sidewalks and curbs on newly constructed or reconstructed streets or portions of streets, within the City of Rochester, shall be subject to the requirements of this section. Ramps shall be the type indicated on the plans and shall be installed as shown on the detail drawings.

Ramps shall be located so as to be totally accessible by a wheelchair, and to be free of any object which would prohibit or impede the intended use of the sidewalk ramp. Ramps and the pavement area in front of the ramp shall be free of any object (i.e., handhole or manhole covers, etc.) which might tend to become slippery or icy during inclement weather; or which might have an exposed pattern that could conceivably prevent or impede the intended use of the sidewalk ramp.

Normal pavement edge profile shall be maintained through the area of the ramp. Drainage structures shall not be placed in line with curb cut ramps except where existing structures are being utilized in new construction. Ramp locations shall take precedence over new drainage structure locations.

At intersections with pedestrian activated signals, ramps shall be placed to enable a person in a wheelchair to activate the signal without stopping on the ramp. Crosswalk and stop line markings shall be located to stop traffic before ramp crossings.

Ramps shall have uniform grades free of sags or short grade changes. Ramp slope shall not exceed 1 on 12. Surface texture of the ramp shall be obtained by coarse brooming the concrete, transverse to the slope of the ramp.

When establishing curb radii elevations, care shall be taken to eliminate any low point and ponding of water, that would occur within the area of a sidewalk ramp. Curb radii elevations may be adjusted as approved by the Project Manager. It is extremely important that all ponding of water within a sidewalk ramp area be eliminated, and the intended use of the sidewalk ramp not be impeded or disrupted.

R608-3.03 Asphalt Driveway

Asphalt driveway shall be constructed as shown on the detail drawings and as required under NYSDOT Section 401.3.

R608-3.04 Brick Sidewalk and Driveway

Brick pavers shall be placed in the pattern shown on the detail drawings to provide a uniformly even surface. Joints shall be hand tight unless otherwise specified. No brick pavers shall be laid or grouted in freezing weather.

A 6 inch gravel course shall be placed on the approved subgrade, and shall extend 6 inches beyond the area of brick paving. A 4 inch Class K concrete foundation shall be constructed over the gravel to the dimensions of the brick paving. Concrete foundation shall be constructed as outlined in Section R608-3.01. A 1 inch layer of mortar sand shall be placed over the concrete. The mortar sand shall be evenly graded, and compacted by means of two passes over the entire area with a mechanical tamper to provide a uniformly even surface.

Brick pavers shall be placed on the mortar sand bed. Prior to placing the brick pavers, the brick pavers shall be saturated surface dry, and the mortar moistened with water.

A dry mixture of mortar for brick paving shall be swept over the brick pavers until the joints are completely filled and the joints lightly fogged with water. Brick pavers shall be cleaned of excess mortar, and joints finished prior to setting of the mortar. Brick pavers shall be kept moist for 4 days after filling the joints with mortar. After the 4 day curing period, removal of remaining mortar film may be accomplished by the use of a light acid wash (10 percent solution of hydrochloric or muriatic acid), followed by flushing clean with water. Care shall be taken to avoid the use of acid in areas where runoff could damage trees or other vegetation.

R608-3.05 Brick Pavers Reset

Caution shall be taken in removing the existing brick pavers so as to avoid breakage. Foreign or extraneous matter shall be removed from the brick. This operation must be performed such that the integrity of the brick is maintained. The brick pavers shall be stored at a location that is safe from damage. The brick pavers should be placed on level ground which will provide even bearing across the stone surface. The work shall be phased so to minimize the duration of storage for the brick pavers.

After the brick pavers have been removed, the mortar bed and subbase material shall be removed and properly disposed of.

The brick pavers shall be reinstalled according to the requirements of Section R608-3.04.

R608-3.06 Stone Sidewalk Reset

A. General

Caution shall be taken in removing the stone sidewalk so that there shall be no breakage. Foreign or extraneous matter shall be removed from the stone block. This operation must be performed in such a manner as to be nondeleterious to the stone block. The stone block shall be stored at a location that is safe from damage. The stone block shall not be stacked more than one high, and should be placed on level ground which will provide even bearing across the stone surface. The work shall be phased so as to reduce to a minimum, the amount of time the stone block is stored.

Salvaged stone sidewalk that is not reset as part of this item, shall be disposed of separately under the appropriate item.

B. Stone Sidewalk Reset - Light Duty

A 6 inch gravel course shall be placed on the approved subgrade, and shall extend 6 inches beyond the dimensions of stone sidewalk. A 2 inch layer of mortar sand shall be placed over the gravel. The mortar sand shall be evenly graded, moistened and compacted by means of two passes over the entire area with a mechanical tamper to provide a uniformly even surface.

The native stone block or a stone block salvaged previously shall be laid on the mortar sand bed. Each stone block must be laid to the appropriate longitudinal and transverse slopes and grades.

In no case shall there be more than a 1/4 inch difference in elevation between adjacent stone edges. The stone block shall be set so that it is evenly bearing on the mortar sand. Any "rocking" of the stone block will be unacceptable.

The subgrade surface, gravel course, mortar sand, and stone block should normally be sloped 1/4 inch per foot towards the street.

C. Stone Sidewalk Reset - Heavy Duty

A 6 inch gravel course shall be constructed as outlined in Section R608-3.06B.

A 5 inch Class K concrete foundation shall be constructed over the gravel to the dimensions of the stone blocks. Concrete foundation shall be constructed as outlined in Section R608-3.01.

A 1 inch layer of mortar sand shall be placed over the concrete foundation. The mortar sand shall be evenly graded, moistened and compacted by means of two passes over the entire area with a mechanical tamper, to provide a uniformly even surface.

A dry mortar mix shall be swept into joints prior to the intial set of the moistened mortar bed. All joints so filled shall be lightly fogged with water and finished off with a joint finishing tool prior to the intial set of the mortar. The stone blocks shall be immediately cleaned of excess mortar.

R608-3.07 Stone Sidewalk Salvaged

A. General

Care shall be taken in removing the stone sidewalk to avoid breakage. All foreign or extraneous material shall be removed from the stone block. This operation shall be performed such that the integrity of the stone block is matained. The stone block shall be stored at a safe location. The stone block shall not be stacked

more than one high, and shall be placed on level ground which will provide even bearing across the stone surface.

B. Labeling

All salvaged stone sidewalk slabs shall be labeled with marking paint on a cleaned side surface. Labeling shall indicate width of slab and running length.

C. Delivery and Inventory Listing

Before delivery to a site designated by the Project Manager, the City Street Maintenance Division shall be notified at least 24 hours in advance. Contact person will be Manager of Street Maintenance at (716) 428-7479.

Upon delivery of salvaged stone slabs to the City, an inventory listing shall be presented to the City's agent, per detail drawing.

When delivered, the salvaged stone slabs shall be stacked neatly and orderly, according to width and type, in a location designated by the City's Street Maintenance Division. Stacked stone slabs shall be separated into layers using 2 by 2 wooden sticker strips.

R608-4 METHOD OF MEASUREMENT

R608-4.01 Concrete Sidewalk and Driveway

The quantity to be measured for payment shall be the number of cubic yards of concrete sidewalk or driveway constructed.

R608-4.02 Asphalt Driveway

The quantity to be measured for payment shall be the number of square feet of driveway installed, when totally reconstructed; or the number of tons of asphalt installed when overlaying or repairing driveways.

R608-4.03 Brick Sidewalk and Driveway

The quantity to be measured for payment shall be the number of square feet of brick sidewalk or driveway constructed or reset.

R608-4.04 Stone Sidewalk

The quantity to be measured for payment shall be the number of square feet of stone sidewalk reset or salvaged.

R608-5 BASIS OF PAYMENT

R608-5.01 Concrete Sidewalk and Driveway

The unit price bid per cubic yard of concrete shall include the cost of: furnishing and placing concrete; saw cutting; preparation of subgrade; forms; premoulded bituminous joint filler; sidewalk ramp installation; resetting of valve boxes, monument covers, handholes, and other appurtenances; and furnishing all labor, material and equipment necessary to complete the work.

Excavation, and furnishing and placing of gravel shall be paid for under separate bid items, or included in the price bid for the item, as indicated in the item description.

R608-5.02 Asphalt Driveway

The unit price bid per square foot of light duty asphalt driveway shall include the cost of: furnishing and placing asphalt top; crushed stone; excavation; saw cutting; and furnishing all labor, material and equipment necessary to complete the work.

The unit price bid per square foot of medium duty asphalt driveway shall also include the cost of furnishing and placing asphalt concrete binder.

The unit price bid per ton of asphalt driveway overlay shall include the cost of: furnishing and placing asphalt top; cleaning the existing asphalt surface; tack coat; and furnishing all labor, material and equipment necessary to complete the work.

R608-5.03 Brick Sidewalk and Driveway

The unit price bid per square foot of brick shall include the cost of: furnishing and installing brick; saw cutting; mortar; water; cleaning; light acid wash; concrete foundation; gravel; excavation; and furnishing all labor, material and equipment necessary to complete the work.

R608-5.04 Brick Pavers Reset

The unit price bid per square foot of brick pavers reset shall include the cost of: removing and reinstalling existing brick pavers; saw cutting; mortar; water; cleaning; light acid wash; concrete foundation; gravel; excavation; and furnsihing all labor, material and equipment necessary to complete the work.

R608-5.05 Stone Sidewalk Reset

The unit price bid per square foot of stone sidewalk reset shall include the cost of: removing, storing, and resetting stone sidewalk slabs; backfill; preparation of subgrade; gravel; mortar sand; mortar; concrete; gravel; excavation; and furnishing all labor material and equipment necessary to complete the work.

R608-5.06 Stone Sidewalk Salvaged

The unit price bid shall include the cost of: removing, delivering, and stacking of stone slabs; excavation; cleaning; handling; stockpiling; labeling; inventorying; sticker strips; and furnishing all labor material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R608.12	Concrete Sidewalk and Driveway	Cubic Yard
R608.13	Concrete Sidewalk and Driveway (Including Excavation)	Cubic Yard
R608.14	Concrete Sidewalk and Driveway (Including Excavation and Gravel)	Cubic Yard
R608.15	Asphalt Driveway - Light Duty	Square Foot
R608.16	Asphalt Driveway - Medium Duty	Square Foot
R608.17	Asphalt Driveway Overlay	Ton
R608.18	Brick Sidewalk and Driveway	Square Foot
R608.19	Reset Existing Brick Pavers	Square Foot
R608.20	Reset Existing Stone Sidewalk - Light Duty	Square Foot
R608.21	Reset Existing Stone Sidewalk - Heavy Duty	Square Foot
R608.22	Salvage Existing Stone Sidewalk	Square Foot

SECTION R609 - CURB

R609-1 DESCRIPTION

The work shall consist of the construction of curb and resetting of curb in conformance with the lines and grades as shown on the plans and as directed by the Project Manager.

R609-2 MATERIALS

R609-2.01 General

The materials shall meet the requirements of the following subsections of NYSDOT Section 700:

Premoulded Resilient Joint Filler	705-07
Mortar for Stone Curbs	705-20
Stone Curb Anchor Bars	709-07
Quilted Cover	711-02
Plastic Coated Fiber Blankets	711-03
Polyethylene Curing Covers	711-04
Membrane Curing Compound	711-05
Precast Concrete Curb	714-04

Concrete cradle and backing shall be Class L conforming to the requirements of Section R504.

R609-2.02 Stone Curb

A. General

Stone curb shall be either a bluestone or granite and shall come from approved quarries. The stone shall be sound and durable, free from seams which impair its structural integrity and of a smooth splitting and machining character. Natural color variations that are characteristic of the deposit will be permitted. Acceptance of any curb containing discoloration other than cleanable surface stains shall be subject to approval by the Project Manager.

B. Dimensional Requirements

1. *General*. Curb shall be cut to conform to the shape and size shown on the standard details and contract plans.

2. *Length*. Curb shall have a minimum length of 3 feet.

3. *Width*. The top width shall be 4 inch or 5 inch as shown on the plans. The bottom width shall be 4 inch minimum for a minimum of 2/3 of the length.

4. *Depth*. Curb shall have a nominal depth of 16 inches, plus or minus 1 inch. Curb used in header sections shall have a depth of 12 inches.

5. *Radius Curb*. Radius curb with radii of less than 100 feet shall be shaped to the required curvature and the ends cut on radial lines.

6. *Bridge Curb*. Bridge Curb shall have a top width of 4 or 5 inches and shall be 12 inches deep. The curb shall be provided with two 3/4 inch diameter anchor holes, located 5 inches down from the top, 12 inches from each end, 3 inches deep, and pitched downward at a 45° angle.

7. *Mountable Curb*. Mountable curb shall have a top width of 5 inches and shall be 16 inches deep, plus or minus 1 inch.

C. Finish

1. *Top Surfaces*. Top surfaces shall be finished to approximately true planes. When sawed, hammered or thermal finishes are applied, no projection or depression shall be greater than 3/16 inch, Saw marks normal to the sawing process will be permitted if within the 3/16 inch tolerance.

2. *Arris Lines*. Top front arris lines shall be straight and true with no variations greater than 1/8 inch measured from a 2 foot straightedge placed along the arris line.

Arris lines at the joints shall not project beyond the plane of a split face and shall not fall under the plane of a split face more than 1/8 inch.

3. *Back Surfaces*. Back surfaces shall have no projection or depression which exceeds a batter of 1 inch in 4 inches for a distance of 3 inches down from the top.

4. *Front Exposed Faces*. Front exposed faces of straight curbs, when split, shall have no projection greater than 3/4 inch or depression greater than 1/2 inch measured from a vertical plane passing through the arris line at the top of the split face for a distance of 8 inches down from the top. For radius units the front exposed faces when split, shall have no projection greater than 1-1/4 inches. Front faces below 8 inches down from the top shall have no projection or depression greater than 1 inch measured in the same manner.

5. *Ends*. Ends of curbs shall be approximately square with the planes of the exposed curb surfaces and shall be finished so that when curbs are set, no space greater than 1/2 inch or less than 1/8 inch shall show in the joints for the full length of the exposed joint. Curb ends below the pavement surface shall not break over 6 inches from the joint plane.

6. *Drill Holes*. Drill holes will not be permitted in exposed curb surfaces.

D. Exceptions to Finish Requirements - Mountable Curb

Exposed faces shall be smooth and quarry split to an approximately true plane having no projection or depression greater than 1 inch from a 2 foot straightedge placed as closely as possible to the plane of the curb face.

Drill holes not more than 3-1/2 inches long and 1/2 inch deep will be permitted along the bottom edge.

Arris lines at joints shall not project beyond the plane of the split face and shall not fall more than 1/4 inch under the plane of the split face.

Curb ends shall be approximately square with the plane of the exposed curb surfaces and finished so that when curbs are set, no space greater than 7/8 inch shall show in the joints for the full width of the face.

E. Basis of Acceptance

Curb shall be inspected for compliance with the material requirements upon arrival at the project location, by the Project Manager. Curb not in compliance with the material requirements will be rejected by the Project Manager.

R609-2.03 Concrete Curb

A. Conventionally Formed

Conventionally formed concrete curb shall be Class K concrete conforming to the material requirements, mix preparation and manufacturing of concrete per Section R504.

B. Machine Formed

Machine formed concrete curb shall be Class J concrete conforming to the material requirements, mix preparation and manufacturing of concrete per NYSDOT Section 501.

R609-3 CONSTRUCTION DETAILS

R609-3.01 Stone Curb

A. General

All stone curb used adjacent to flexible type pavement shall be set on continuous concrete backing. Dry mix concrete shall be used for the portion of the backing located below the bottom of the curb.

All curb shall be set true to line and grade on the indicated foundation material. Concrete backing details shall be in accordance with the detail drawings for curb, unless other special construction details are called for on the plans. All spaces beneath the curb shall be carefully and thoroughly compacted to provide a firm and uniform bearing. Granular backing material shall meet the material requirements of the subbase course material being utilized on the project site.

After the curb has been set, it shall be backfilled with an approved material. The material shall be thoroughly tamped before proceeding with any further work in the area adjacent to the curb.

Adjoining pieces of curb shall not touch each other, and the space between the pieces of curb shall not be less than 1/8 inch or more than 1/2 inch.

The joints in the curb shall be carefully filled with cement mortar for a minimum of 12 inches down from the top of the curb. The cement mortar shall be mixed and rodded in place as indicated in NYSDOT Section 705-20. The top and exposed front face of the joint shall be neatly pointed, flush with the curb surfaces, and satisfactorily cleaned of all excess mortar. The curb shall be kept clean, in its alignment, and protected from damage until completion of the contract.

B. Radius Curb and Sidewalk Ramps

When establishing curb radii elevations, care shall be taken so as to eliminate any low point and ponding of water, that would occur within the area of a sidewalk ramp. Curb radii elevations may be adjusted as approved by the Project Manager. It is extremely important that all ponding of water within a sidewalk ramp area be eliminated and the intended use of the sidewalk ramp not be impeded or disrupted.

C. Bridge Stone Curb

Prior to the construction of the concrete backing, the curb shall have 12 inch long, 1/2 inch diameter, galvanized bent steel bars implanted within the anchor holes. The bars shall extend out of the curb and be encased within the concrete backing.

D. Resetting Existing Stone Curb

Care shall be taken in removing existing curb so that breakage is avoided.

If directed by the Project Manager, all joints and tops shall be redressed to obtain a smooth top surface and to obtain joints of the same class as specified for new curb.

R609-3.02 Salvaged Stone Curb

A. General

All solid, acceptable and resettable stone curbing as removed under normal excavation items, shall be cleaned, labeled, inventoried and delivered to City facilities .

B. Cleaning

All loose dirt and concrete shall be removed from salvaged curb.

C. Labeling

All salvaged curb shall be labeled on the top surface in yellow paint. Labeling shall indicate length of curb, thickness and radius size (if applicable), for example: 6 feet - 15 foot radius - 4 inches thick.

D. Delivery and Inventory Listing

Before delivery to a site designated by the Project Manager, the City Street Maintenance Division must be notified at least 24 hours in advance. Contact person will be the Manager of Street Maintenance at (716) 428-7479.

Upon delivery of salvaged curbing to the City, an inventory listing shall be presented to the City's agent, per detail drawing.

When delivered, the salvaged curbing shall be placed neatly and orderly according to size, type and classification in a location as designated by the City Street Maintenance Division. Stacked curbing shall be separated into layers using 2 X 2 wooden sticker strips.

Any curb broken during excavation or salvage operations, or found to be unacceptable for reuse by the Project Manager, shall be disposed of. Payment for this disposal shall be included in the unit bid price for salvaged curb.

R609-3.03 Concrete Curb

A. General

Concrete curb shall be either conventionally formed or machine formed to the size and shape shown on the detail drawings.

B. Conventionally Formed Concrete Curb

Curb shall be cast in segments having a uniform length of approximately 10 feet. Segments shall be separated by construction joints, with provisions made at each joint for 1/4 inch expansion. When the curb is constructed next to cement concrete pavement, the construction joint adjacent to the end of the pavement slab shall line up with the pavement joint.

Expansion joints 3/4 inch in width shall be provided at 20 foot intervals and formed with premoulded bituminous joint filler. The filler material shall be cut to conform to the cross section of the curb. When curb is cast adjacent to cement concrete pavement constructed with expansion joints, expansion joints in the curb shall be located at the expansion joints in the pavement.

Forms shall be steel or wood, straight, free from warp, and of such construction that there will be no interference to inspection for grade or alignment. All forms shall extend for the full curb depth and shall be braced and secured adequately so that no displacement from alignment will occur during placing of concrete.

Concrete shall be placed in the forms in accordance with the applicable requirements of NYSDOT Section 555-3.04, and shall be compacted with an approved, immersion type mechanical vibrator. The vibrator shall be of the size and weight capable of thoroughly vibrating the entire mass without damaging or misaligning the forms. Forms shall be left in place for 24 hours or until the concrete has sufficiently hardened, so that they can be removed without injury to the curb. Upon removal of the forms, the exposed faces of the curb shall be immediately rubbed to a uniform surface. Rubbing shall be accomplished by competent finishers. No plastering shall be permitted.

Curing of the curb shall comply with the requirements of NYSDOT Section 502-3.10. Minimum curing periods for the various types of curing materials used shall comply with the requirements of Table 502-2 in NYSDOT Section 502.

The curb shall be kept clean, in proper alignment, and protected from damage until final acceptance of the work.

C. Machine Formed Concrete Curb

Curb shall be machine formed to the proper line and grade. The Project Manager may require that a demonstration be performed of the specific equipment proposed to be used, and that such equipment be capable of satisfactorily placing the concrete mix.

Contraction joints shall be formed or saw cut to depths slightly below the surface of the adjacent pavement every 10 feet. When the curb is constructed next to cement concrete pavement, the contraction joint in the curb adjacent to the end of the pavement slab shall line up with the pavement joint. The saw cut or formed joints shall be left unfilled.

Expansion joints, 3/4 inch in width, shall be provided at 20 foot intervals and formed with premoulded bituminous joint filler. The filler material shall be cut to conform to the cross section of the curb. When the curb is machine formed and is adjacent to cement concrete pavement constructed with expansion joints, expansion joints in the curb shall be located at the expansion joints in the pavement.

Curing of the curb shall comply with the requirements of NYSDOT Section 502-3.10. Minimum curing periods for the various types of curing materials shall comply with the requirements of Table 502-2 in NYSDOT Section 502.

The curb shall be kept clean, in proper alignment, and protected from damage until final acceptance of the work.

D. Precast Concrete Curb

The construction details of Section R609-3.01A shall apply, except that references to stone curb shall be replaced with precast concrete curb.

R609-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of linear feet of curb installed, as measured along the top front arris line of the curb.

R609-5 BASIS OF PAYMENT

R609-5.01 General All Items

The unit price bid per linear foot shall include the cost of: select backfill, except where select granular backfill is called for; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made after the curb has been satisfactorily constructed and all curb joints pointed.

R609-5.02 Stone Curb

The unit price bid per linear foot shall also include the cost of: furnishing and installing granite curb; continuous concrete cradle; steel anchor rods for bridge curb; mortar; granular backing material; and pointing of joints.

All straight, transition, and header curb, and all radius curb with a radius of 100 feet or more, shall be paid as Stone Curb. All radius curb with a radius less than 100 feet, and all transition and header curb which fall within the radius, shall be paid as Radius Stone Curb.

Excavation will be paid for separately under Section R203.

R609-5.03 Reset Existing Stone Curb

The unit price bid per linear foot shall also include the cost of: removing, redressing, and reinstalling the existing curb; excavation; continuous concrete cradle; mortar; granular backing material; and pointing of joints.

R609-5.04 Stone Curb - Curb Replacement

The unit price bid per linear foot shall also include the cost of: removing, redressing, and resetting existing curb; furnishing and installing new granite curb; excavation; gravel necessary to adjust the subgrade elevation; Class C concrete foundation for pavement; asphalt tack coat; continuous concrete cradle; mortar; full depth pavement saw cutting; granular backing material; and pointing of joints. Pay limits shall be per detail drawings.

When curb replacement items are being used within a reconstruction area, the pavement may be either concrete base or an asphalt base. The type of pavement base to be utilized shall be as noted on the plans. Where an asphalt base pavement is to be used, the concrete base and asphalt tack coat will be replaced by a asphalt base course, and subbase courses type 1 and type 2. The unit price bid per linear foot for curb replacement items will be the same regardless of which type of pavement base is used.

R609-5.05 Salvaged Stone Curb

The unit price bid shall also include the cost of: removing, delivering, and stacking stone curb; cleaning; handling; stockpiling; labeling; inventorying; and wooden sticker strips.

R609-5.06 Concrete Curb

The unit price bid per linear foot shall also include the cost of: furnishing and installing new concrete curb; joint dowels; expansion joints; bituminous joint filler; forms; and finishing of concrete surface including rubbing and curing materials.

R609-5.07 Concrete Curb - Curb Replacement

The unit price bid per linear foot shall also include the cost of: removing existing curb; furnishing and installing new concrete curb; excavation; gravel necessary to adjust the subgrade elevation; Class C concrete foundation for pavement; asphalt tack coat; joint dowels; expansion joints; bituminous joint filler; forms; and finishing of concrete surface including rubbing and curing materials. Pay limits shall be per detail drawings.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R609.21	4" Stone Curb	Linear Foot
R609.22	4" Radius Stone Curb	Linear Foot
R609.23	5" Stone Curb	Linear Foot
R609.24	5" Radius Stone Curb	Linear Foot
R609.25	5" Mountable Stone Curb	Linear Foot
R609.26	5" Mountable Radius Stone Curb	Linear Foot
R609.27	Reset Existing Stone Curb	Linear Foot
R609.28	4" Stone Curb - Curb Replacement	Linear Foot
R609.29	4" Radius Stone Curb - Curb Replacement	Linear Foot
R609.30	5" Stone Curb - Curb Replacement	Linear Foot
R609.31	5" Radius Stone Curb - Curb Replacement	Linear Foot
R609.32	5" Mountable Stone Curb - Curb Replacement	Linear Foot
R609.33	5" Mountable Radius Stone Curb - Curb Replacement	Linear Foot
R609.34	Reset Existing Stone Curb - Curb Replacement	Linear Foot
R609.35	Salvage Existing Stone Curb	Linear Foot
R609.36	Concrete Curb	Linear Foot
R609.37	Precast Concrete Curb	Linear Foot
R609.38	Concrete Curb - Curb Replacement	Linear Foot

SECTION R610 - HYDROSEEDING, SEEDING, SHREDDED BARK MULCH, AND PEA GRAVEL

R610-1 DESCRIPTION

The work shall consist of all work involved in the establishment and care of turf, and the miscellaneous treatment of planting areas, as shown on the plans and as directed by the Project Manager.

R610-2 MATERIALS

R610-2.01 Seeding

Seeds shall be as specified under NYSDOT Section 713-04. Fertilizers shall be as specified under NYSDOT Section 713-03. Limestone shall be as specified NYSDOT Section 713-02. Mulch materials shall be as specified on the plans.

Where seeding materials are not specified on the plans, the following shall apply: fertilizer shall be Type 1 (5-10-5); mulch shall be per NYSDOT Section 713-18 or 713-19; mulch anchorage shall be per NYSDOT Section 713-12; chemical mulch binders, as approved; seed shall be:

Name And Variety	Percent By Weight	Percent Purity	Percent Germination
Pennfine Perennial Rye Grass	35	85	85
Pennlawn Red Fescue	35	97	80
Common Kentucky Bluegrass	30	85	80

R610-2.02 Shredded Bark Mulch

Shredded bark mulch shall be 1/2 to 1 inch in size maximum. Bark shall be free of organic matter and debris.

R610-2.03 Pea Gravel

Materials shall consist of washed pea gravel. All materials furnished shall be well graded and free from organic or other deleterious materials.

A. Gradation

Sieve Size	Percent Passing By Weight
1/2 inch	100
1/4 inch	85-100
1/8 inch	0-15

B. Soundness

Material will be accepted on the basis of a Magnesium Sulfate Soundness Loss after 4 cycles of 20 percent or less.

C. Elongated Particles

Not more than 30 percent, by weight, of the particles retained on a 1/2 inch sieve shall consist of flat or elongated particles. A flat or elongated particle is defined herein as one which has its greatest dimension more than 3 times its least dimension. Acceptance for this requirement will normally be based on a visual inspection by the Project Manager. When the City elects to test for this requirement, material with a

percentage greater than 30 percent will be rejected. All material shall meet the specified gradation prior to placement on the grade. All processing shall be completed at the source.

D. Stockpiling

All material shall be stockpiled. Stockpile construction requirements, sampling, testing and acceptance/rejection procedures shall be as stipulated in the appropriate NYSDOT departmental publication.

R610-3 CONSTRUCTION DETAILS

R610-3.01 General

A. Season

The work may be performed at any season of the year when a mulch is used. When no mulch is used the seasons for seeding shall be as specified on the plans. The Project Manager shall be notified at least 2 days in advance of sowing any seed, and work shall not proceed until permission to do so has been obtained. When delays in operations carry the work beyond the dates which are specified, or when conditions of high winds, excessive moisture or ice are such that satisfactory results are not likely to be obtained for any stage of the work, the Project Manager will stop the work. The work shall be resumed with the Project Manager's approval when the desired results are likely to be obtained or when approved corrective measures and procedures are adopted. When sodding is to be done on the same general areas to be seeded, the sodding shall be done before the seed is sown and equipment used during seeding shall cause no damage to the sodded areas.

B. Sampling, Mixing and Inoculating Seeds

Provisional acceptance of the seeds may be required before the seeds are mixed. Each lot of seed shall be subject to sampling and testing before mixing. Sowing seed shall not be delayed pending reports of these tests. Sampling shall be accomplished by a method as approved by the Project Manager. Seeds of the kinds specified shall be mixed on the job in the formula specified. Seed mixed prior to delivery may be approved on the basis of a certification by the vendor stating the minimum percentage of germination and purity of each kind of seed and the quantity of each kind of seed in the mixture. All seed of leguminous plants shall be inoculated prior to mixing or sowing unless accompanied by a certification of preinoculation. When seed is to be sown dry and is to be inoculated, the culture shall be applied as directed by the manufacturer and as approved by the Project Manager, and the seed allowed to dry sufficiently to be in the proper condition for mixing or sowing. Seed must be sown within 30 hours after this treatment. Where seed is to be distributed by water pressure, the proper proportion of inoculant may be added to the water and seed mixture, together with any limestone or fertilizer specified, providing the alkalinity of the solution does not exceed 8 PH.

C. Mulching

The surface of areas where mulch is to be applied shall be cleared of stones, stumps, wire or other obstacles which might hinder the subsequent seeding operations. Where required by the plans, the ground shall be harrowed or disked to produce a state of suitable tillage. The mulch shall be spread uniformly in a continuous blanket of sufficient thickness to completely hide the soil from view. The rate of application shall be as specified and shall be considered a minimum rate. The mulch may be spread by hand or by machinery. When mulching and seeding are specified, the mulch may be spread before but not later than 3 days after seeding. Anchorage will be required unless otherwise specified on the plans. Anchorage to hold the mulch in place may be applied by an approved method either during or after the mulching operation.

D. Liability

Final acceptance of the seed will be subject to the results of official sampling and testing. The weight of seed sown is based on its labeled purity and germination. Tolerances approved by the Department of Seed Investigations, New York State Agricultural Experiment Station, Geneva, New York, for the various seed species, will be used in the determination of whether seed conforms to the labeled purity and germination statements and meets the minimum specified. When, after the application of the appropriate tolerances, the purity and germination of any kind of seed except cereal grain and legumes are shown by the official tests to be less than that shown on the label, but the germination meets the minimum specified with the appropriate tolerance applied, and the specified weight of pure live seed has not been sown, the deficiency shall be sown.

When the germination of any kind of seed except cereal grains and legumes is shown by the official tests to be less than the minimum specified, after the appropriate tolerances have been applied, it will be considered a total deficiency. Such deficiency shall require complete reseeding of the kind of seed which was deficient.

When, in the judgment of the Project Manager, at any time prior to the acceptance of the contract, any area which has been seeded fails for any reason to produce a satisfactory growth of grass after a suitable period of time has elapsed, the area shall be reseeded and refertilized in the same manner as specified in the contract. If deemed necessary by the Project Manager, the area shall also be remulched at the rate specified in the contract.

E. Care During Construction

The seeded and mulched areas shall be cared for until final acceptance of the project. Such care shall consist of providing protection against traffic by approved warning signs or barricades, and repairing of any areas damaged following the seeding or mulching operations due to wind, water, fire or other causes. Such damaged areas shall be repaired to reestablish the condition and grade of the area prior to seeding and shall then be refertilized, reseeded and remulched as specified herein. The seeded areas shall be mowed until acceptance of the contract by cutting on a biweekly basis, or to a height of 3 inches when growth reaches 6 inches, or when the growth tends to smother seedlings.

R610-3.02 Hydroseeding

A. Rates

Rates for seeding materials shall comply with the following:

Fertilizer - 1,000 pounds per acre
Seed - 260 pounds per acre or 6 pounds per 1,000 square feet
Mulch - 1,500 pounds per acre
Water - 2,500 gallons per acre

R610-3.03 Seeding

A. Rates

Rates for seeding materials shall comply with the following:

Fertilizer - 20 pounds per 1000 square feet
Seed - 6 pounds per 1000 square feet
Mulch - 90 pounds per 100 square yards
Mulch Anchorage - manufacturer's recommended rate

B. Ground Preparation and Seeding

Areas to be seeded shall be maintained at approved grades. Irregularities which form low places which will hold water shall be eliminated. Limestone, fertilizers and seeds in the amounts specified shall be evenly distributed on the surfaces to be seeded. All mechanical equipment for soil preparation or seeding shall be as approved and shall pass parallel to the contours.

When ordered by the Project Manager, measured plots shall be established to determine if the specified quantities of seed, fertilizer, mulch, etc. are being applied.

Other work shall be according to Method 1 as outlined below unless Method 2 is specified. Regardless of which method is specified, the finished surface of any area that is seeded shall not be rougher, more uneven or have more or larger stones, clods, roots, or other foreign materials than the area it adjoins. In built up and residential areas this may require hand raking to attain this degree of smoothness and uniformity, particularly where grading and seeding is to be done adjacent to lawns.

1. Method 1. Areas to be seeded shall be scarified sufficiently to break up the surface crust immediately before seeding, except where the ground is loose and friable as immediately following grading. All stones over 6 inches in greatest dimension which are loose and subject to rolling or sliding and all other objects which would be detrimental to mowing shall be removed and disposed of. Agricultural limestone, fertilizers and seed may be mixed together immediately before placing. Any method of distribution such as by air or water pressure will be acceptable except that the seed shall not be injured in the process of spreading.

2. Method 2. Areas to be seeded shall be harrowed, disked, or otherwise completely pulverized to a state of tillage acceptable to the Project Manager. All stone or other undesirable material over 2 inches in greatest dimension shall be removed and disposed of as approved. Limestone or fertilizer as specified shall be incorporated to the depth of 2 inches below the finished grades. Mechanical drills or seeders shall place the seed to a depth not exceeding 1/4 inch. Seed distributed on the surface shall be covered to a depth not exceeding 1/4 inch by raking, brush or chain harrowing. Broadcast seeding shall not be done during windy weather. After sowing, the seeded areas shall be lightly rolled by approved rollers.

R610.3.04 Shredded Bark Mulch and Pea Gravel

A. Method

Area shall be covered with a weed barrier fabric, and bark and gravel shall be uniformly spread to the required thickness and lightly compacted.

B. Care and Repair

The mulched or graveled areas shall be cared for until final acceptance of the project. Such care shall consist of providing protection against traffic by approved warning signs or barricades, and repair of areas damaged by erosion, wind, fire or other causes. Such areas shall be repaired to reestablish the condition and grade of the soil prior to mulching or placing of gravel and shall then be remulched or regraveled as specified under this work.

R610-4 METHOD OF MEASUREMENT

R610-4.01 Hydroseeding and Seeding

The quantity to be measured for payment shall be the number of square feet of surface area which has been acceptably treated.

R610-4.02 Shredded Bark Mulch and Pea Gravel

The quantity to be measured for payment shall be the number of cubic yards of material placed.

R610-5 BASIS OF PAYMENT

R610-5.01 Hydroseeding and Seeding

The unit price bid per square foot shall include the cost of: furnishing and applying soil conditioners; mulch; seed; mowing; and furnishing all labor, material and equipment necessary to complete the work.

50 percent of the payment will be made after the initial seeding operation and the remaining 50 percent will be paid after acceptance.

R610-5.02 Shredded Bark Mulch and Pea Gravel

The unit price bid per cubic yard shall include the cost of: weed barrier fabric; furnishing and placing shredded bark mulch or pea gravel; and furnishing all labor, material and equipment necessary to omplete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R610.05	Hydroseeding	Square Foot
R610.06	Seeding	Square Foot
R610.07	Shredded Bark Mulch	Cubic Yard
R610.08	Pea Gravel	Cubic Yard

SECTION R611 - PLANTING

R611 GENERAL

The work shall conform to the requirements of NYSDOT Section 611 with the following modifications:

R611-5 BASIS OF PAYMENT

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R611.10XX	Deciduous Tree - botanical name - common name	Each
R611.1001	Deciduous Tree - Fraxinus americana "Autumn Purple" - Autumn Purple Ash	Each
R611.1002	Deciduous Tree - Fraxinus pennsylvanica "Marshall's Seedless" - Marshall's Seedless Green Ash	Each
R611.1003	Deciduous Tree - Fraxinus americana "Rose Hill" - Rose Hill White Ash	Each
R611.1004	Deciduous Tree - Fraxinus pennsylvanica "Summit" - Summit Green Ash	Each
R611.1005	Deciduous Tree - Prunus serrulata "Kwanzan" - Kwanzan Cherry	Each
R611.1006	Deciduous Tree - Prunus "Sargentii" - Sargent Cherry	Each
R611.1007	Deciduous Tree - Phellodendron amurense - Amur Cork Tree	Each
R611.1008	Deciduous Tree - Malus "Centurion" - Centurion Crabapple	Each
R611.1009	Deciduous Tree - Malus "Hopa" - Hopa Crabapple	Each
R611.1010	Deciduous Tree - Malus "Radiant" - Radiant Crabapple	Each
R611.1011	Deciduous Tree - Malus "Red Baron" - Red Baron Crabapple	Each
R611.1012	Deciduous Tree - Malus "Royalty" - Royalty Crabapple	Each
R611.1013	Deciduous Tree - Malus "Snowdrift" - Snowdrift Crabapple	Each
R611.1014	Deciduous Tree - Corylus colurna -Turkish Filbert	Each
R611.1015	Deciduous Tree - Ginkgo biloba "Autumn Gold" - Autumn Gold Ginkgo	Each
R611.1016	Deciduous Tree - Ginkgo biloba "Sentry" - Sentry Ginkgo	Each
R611.1017	Deciduous Tree - Celtis occidentalis - Common Hackberry	Each
R611.1018	Deciduous Tree - Crataegus "Lavalle" - Lavalle Hawthorn	Each
R611.1019	Deciduous Tree - Crataegus phaenopyrum - Washington Hawthorn	Each

ITEM NO.	ITEM	PAY UNIT
R611.1020	Deciduous Tree - Gleditsia triacanthos inermis "Shademaster" - Shademaster Honeylocust	Each
R611.1021	Deciduous Tree - Gleditsia triacanthos inermis "Skyline" - Skyline Honeylocust	Each
R611.1022	Deciduous Tree - Carpinus betula "Fastigiata" - Pyramidal European Hornbeam	Each
R611.1023	Deciduous Tree - Tilia cordata "Chancellor" - Chancellor Little-Leaf Linden	Each
R611.1024	Deciduous Tree - Tilia euchlora -Crimean Linden	Each
R611.1025	Deciduous Tree - Tilia cordata "DeGroot" - DeGroot Linden	Each
R611.1026	Deciduous Tree - Tilia cordata "Glenleven" - Glenleven Linden	Each
R611.1027	Deciduous Tree - Tilia cordata "Greenspire" - Greenspire Linden	Each
R611.1028	Deciduous Tree - Tilia tomentosa "Sterling Silver" - Silver Linden	Each
R611.1029	Deciduous Tree - Gleditsia triacanthos inermis "Imperial" - Imperial Locust	Each
R611.1030	Deciduous Tree - Acer rubrum "Armstrong" - Armstrong Red Maple	Each
R611.1031	Deciduous Tree - Acer platanoides "Cleveland" - Cleveland Norway Maple	Each
R611.1032	Deciduous Tree - Acer platanoides "Columnare" - Columnar Norway Maple	Each
R611.1033	Deciduous Tree - Acer platanoides "Crimson King" - Crimson King Norway Maple	Each
R611.1034	Deciduous Tree - Acer platanoides "Emerald Queen" - Emerald Queen Norway Maple	Each
R611.1035	Deciduous Tree - Acer saccharum "Green Mountain" - Green Mountain Sugar Maple	Each
R611.1036	Deciduous Tree - Acer campestre - Hedge Maple	Each
R611.1037	Deciduous Tree - Acer rubrum "Karpick"- Karpick Red Maple	Each
R611.1038	Deciduous Tree - Acer rubrum "October Glory" - October Glory Red Maple	Each
R611.1039	Deciduous Tree - Acer platanoides "Summershade" - Summershade Norway Maple	Each
R611.1040	Deciduous Tree - Quercus rubra - Northern Red Oak	Each
R611.1041	Deciduous Tree - Pyrus calleryana "Aristocrat" - Aristocrat Pear	Each
R611.1042	Deciduous Tree - Pyrus calleryana "Bradford" - Bradford Pear	Each
R611.1043	Deciduous Tree - Pyrus calleryana "Redspire" - Redspire Pear	Each

ITEM NO.	ITEM	PAY UNIT
R611.1044	Deciduous Tree - Pyrus calleryana "White House" - White House Pear	Each
R611.1045	Deciduous Tree - Platanus x. acerifolia "Bloodgood" - Bloodgood London Plane	Each
R611.1046	Deciduous Tree - Eucommia ulmoides - Hardy Rubber Tree	Each
R611.1047	Deciduous Tree - Sophora japonica - Regent Scholar	Each
R611.1048	Deciduous Tree - Amelanchier x. 'Robin Hill' - Robin Hill Serviceberry	Each
R611.1049	Deciduous Tree - Amelanchier canadensis - Shadblow Serviceberry	Each
R611.1050	Deciduous Tree - Amelanchier - Springtyme Serviceberry	Each
R611.1051	Deciduous Tree - Zelkova serrata "Green Vase" - Green Vase Zelkova	Each
R611.1052	Deciduous Tree - Zelkova serrata "Village Green" - Village Green Zelkova	Each
R611.1053	Deciduous Tree - Malus "Donald Wyman" - Donald Wyman	Each
R611.1054	Deciduous Tree - Cercidiphyllum japonicum - Katsura Tree	Each
R611.1055	Deciduous Tree - Malus sutyzam - Sugartyme	Each
R611.20XX	Evergreen Tree - botanical name - common name	Each
R611.2001	Evergreen Tree - Pseudotsuga taxifolia - Douglas Fir	Each
R611.2002	Evergreen Tree - Pseudotsuga taxifolia - White Fir	Each
R611.2003	Evergreen Tree - Tsuga canadensis - Canadian Hemlock	Each
R611.2004	Evergreen Tree - Pinus nigra - Austrian Pine	Each
R611.2005	Evergreen Tree - Pinus sylvestris - Scotch Pine	Each
R611.2006	Evergreen Tree - Pinus strobus - White Pine	Each
R611.2007	Evergreen Tree - Picea glauca denoata - Black Hills Spruce	Each
R611.2008	Evergreen Tree - Picea pungeus -Colorado Spruce	Each
R611.2009	Evergreen Tree - Picea abies - Norway Spruce	Each
R611.2010	Evergreen Tree - Picea glauca - White Spruce	Each
R611.30XX	Deciduous Shrub - botanical name - common name	Each
R611.3001	Deciduous Shrub - Myrica pennsylvanica - Northern Bayberry	Each
R611.3002	Deciduous Shrub - Euonymus alata "Compacta" - Dwarf Burningbush	Each
R611.3003	Deciduous Shrub - Aronia melanocarpa - Black Chokeberry	Each

ITEM NO.	ITEM	PAY UNIT
R611.3004	Deciduous Shrub - Cotoneaster apiculatus - Cranberry Cotoneaster	Each
R611.3005	Deciduous Shrub - Cotoneaster divaricatus - Spreading Cotoneaster	Each
R611.3006	Deciduous Shrub - Viburnum trilobum - American Cranberrybush	Each
R611.3007	Deciduous Shrub - Viburnum opulus - European Cranberrybush	Each
R611.3008	Deciduous Shrub - Forsythia suspensa - Weeping Forsythia	Each
R611.3009	Deciduous Shrub - Lonicera xylosteum - "Hedge King" - Hedge King Honeysuckle	Each
R611.3010	Deciduous Shrub - Elaeagnus umbellata - Autumn Olive	Each
R611.3011	Deciduous Shrub - Elaeagnus angustifolia - Russian Olive	Each
R611.3012	Deciduous Shrub - Ligustrum amurense - Amur Privet	Each
R611.3013	Deciduous Shrub - Ligustrum obtusifolium regelianum - Regal Border Privet	Each
R611.3014	Deciduous Shrub - Berberis spp - Barberry SPP	Each
R611.3015	Deciduous Shrub - Syringa spp - Lilac SPP	Each
R611.3016	Deciduous Shrub - Philadelphus spp - Mock-orange SPP	Each
R611.3017	Deciduous Shrub - Chaenomeles spp - Quince SPP	Each
R611.3018	Deciduous Shrub - Weigela spp - Weigela SPP	Each
R611.3019	Deciduous Shrub - Rhus aromatica - Fragrant Sumac	Each
R611.3020	Deciduous Shrub - Rhamnus frangula columnaris - Columnar Tallhedge	Each
R611.3021	Deciduous Shrub - Viburnum dentatum - Arrowwood Viburnum	Each
R611.3022	Deciduous Shrub - Viburnum prunifolium - Blackhaw Viburnum	Each
R611.3023	Deciduous Shrub - Viburnum plicatum tomentosum - Doublefile Viburnum	Each
R611.40XX	Evergreen Shrub - botanical name - common name	Each
R611.4001	Evergreen Shrub - Arborvitae occidentalis "Nigra" - Darkgreen Arborvitae	Each
R611.4002	Evergreen Shrub - Arborvitae occidentalis "Techny" - Mission Arborvitae	Each
R611.4003	Evergreen Shrub - Euonymus fortune "Greenlane" - Greenlane Euonymus	Each
R611.4004	Evergreen Shrub - Ilex crenata - Japanese Holly	Each
R611.4005	Evergreen Shrub - Juniperus sabina "Blue Danube" - Blue Danube Juniper	Each

ITEM NO.	ITEM	PAY UNIT
R611.4006	Evergreen Shrub - Juniperus horizontalis "Wiltonii" - Blue Rug Juniper	Each
R611.4007	Evergreen Shrub - Juniperus chinensis sargentii "Glauca" - Blue Sargent Juniper	Each
R611.4008	Evergreen Shrub - Juniperus chinensis "Glauca Hetzi" - Hetz Blue Juniper	Each
R611.4009	Evergreen Shrub - Juniperus chinensis "Pfitzeriana" - Pfitzer Juniper	Each
R611.4010	Evergreen Shrub - Pinus mugo - Mugo Pine	Each
R611.4011	Evergreen Shrub - Taxus cuspidata capitata - Capitata Yew	Each
R611.4012	Evergreen Shrub - Taxus cuspidata mana - Compact Japanese Yew	Each
R611.4013	Evergreen Shrub - Taxus media "Hicksii" - Hicks Yew	Each
R611.50XX	Vines and Ground Cover - botanical name - common name	Each
R611.5001	Vines and Ground Cover - Arctostaphylos uva-ursi - Bearberry	Each
R611.5002	Vines and Ground Cover - Coronilla varia - Crownvetch	Each
R611.5003	Vines and Ground Cover - Lonicera japonica "Halliana" - Hall's Honeysuckle	Each
R611.5004	Vines and Ground Cover - Hedera helix baltica Baltic Ivy	Each
R611.5005	Vines and Ground Cover - Hedera helix - English Ivy	Each
R611.5006	Vines and Ground Cover - Vinca minor - Myrtle	Each
R611.5007	Vines and Ground Cover - Pachysandra terminalis - Pachysandra	Each
R611.5008	Vines and Ground Cover - Vinca minor - Periwinkle	Each
R611.5009	Vines and Ground Cover - Euonymus fortunei "Colorata" - Purpleleaf Wintercreeper	Each

SECTION R614 - CARE OF PLANTS

R614-1 DESCRIPTION

The work shall consist of pruning, removal, or relocation of plants, and stump removal as shown on the plans and as directed by the Project Manager.

R614-2 MATERIALS

None specified.

R614-3 CONSTRUCTION DETAILS

R614-3.01 Pruning

A. Equipment

Workers shall not be permitted to climb trees with climbing spurs, but shall employ accepted tree climbing methods. All tools used and methods employed shall be as approved. The cutting surfaces of all tools, ladders, ropes, soles of workmen's shoes and other objects coming into contact with the plant shall be washed with an approved disinfectant at the start of any work on a plant to prevent the spread of any plant diseases.

B. Pruning

The plant shall be pruned of undesirable wood, and the resulting crown shaped to the natural habit of the kind of the plant. All branches interfering with or hindering the healthy growth of the plant shall be removed. All diseased branches and dead branches shall be removed. Any branch which may be partly dead, yet has a healthy lateral branch at least 1/3 the diameter of the parent branch shall be removed beyond the healthy portion of the branch, providing the result does not prove to be unsightly. All branches on plants interfering with sight distance or signs, and on trees less than 16 feet above any part of the roadway, shall be removed.

Plants will be pruned so as to allow clear pedestrian passage along the sidewalks. Lateral clearance, shall be 12 inches minimum wherever possible. Minimum height of overhanging branches for trees shall be 7 feet.

All stubs or improper cuts resulting from former pruning shall be removed. All cuts shall be cleanly made with sharp tools as close to the parent trunk or limb as possible, without disturbing the callus collar. All large bark wounds shall be scar traced in accordance with good horticultural practice. All nails, spikes, wire or other materials driven into or fastened to the trunk or branches of a tree shall be removed, or if approved they shall be cut flush in a manner to permit complete healing over.

C. Cleanup and Disposal

All trunks, branches, rubbish and debris resulting from the work shall be removed and disposed of as specified in NYSDOT Section 201-3.03.

R614-3.02 Plant Removal

A. General

No plant shown on the plans to be removed, or listed for removal under this section, shall be cut until approved by the Project Manager. All work involving public utilities shall be coordinated with the respective utility company.

All trees shall be "topped" and "limbed" before felling.

Stumps of plants removed under this item shall be grubbed, ground or cut. All stump holes shall be backfilled with the specified materials and compacted within 1 week after start of work on the stump. The work of establishing grass on the stump hole areas shall be performed as required.

If, in the opinion of the Project Manager, unsafe tools, equipment or methods are employed, work shall be stopped until such unsafe conditions have been corrected.

B. Disposal of Wood

The requirements of NYSDOT Section 201-3.03 shall apply.

C. Liability

All plants, curbs, pavements, structures, utility lines and other features on the highway right-of-way and adjacent property shall be protected. Any damage incurred while performing work under this section shall be repaired immediately.

R614-3.03 Plant Relocation

A. General

In lieu of conventional transplanting, plants may be transplanted by using a treespade.

B. Transplanting

The existing plants to be relocated shall be removed and the root system properly and carefully balled, according to the best practices of the nursery trade. Considering the site restraints, as large a ball as can be handled without destroying the plant or adjacent plants, shall be excavated. For trees, an attempt shall be made to hold the ball at 2 foot 8 inch minimum width and to a depth to encompass the majority of the root system, 2+ feet.

After the ball is formed, wrap the ball tightly with burlap and drum lace the ball with rope. The plants shall then be transplanted to the new location.

Transplanted plants shall be planted at the same depth as the plant originally grew. Tamp in backfillcarefully. When sufficient backfill has been placed to the top of the ball, carefully water the plant thoroughly. Place additional backfill material to replace settlement caused by watering.

Trim the plant carefully to protect the typical shape of the plant.

After the plant has been planted, form a 3 inch high saucer of earth around the perimeter of the plant pit. Spread a uniform 3 inch layer of bark mulch over the entire surface of the plant pit.

All transplanting is to be done properly and carefully. Maintenance of transplanted trees shall be the same as with new tree planting.

C. Backfilling

Backfilling the resultant hole left from plant removal shall be with topsoil meeting the requirements of NYSDOT Section 613 or, if other construction is anticipated in the same area, with select granular fill meeting Section R203.

Surface restoration shall be the same as the area immediately surrounding the hole left from plant removal. All materials shall meet City of Rochester specifications.

R614-3.04 Stump Removal

A. General

Stumps listed for removal shall be grubbed, ground or cut as specified. All stump holes shall be backfilled with the specified materials, and compacted within 1 week after start of work on the stump. The work of establishing grass on the stump hole areas shall be performed as required.

If, in the opinion of the Project Manager, unsafe tools, equipment or methods are employed, work shall be stopped until such unsafe conditions have been corrected.

B. Disposal of Wood

The requirements of NYSDOT Section 201-3.03 shall apply.

C. Liability

All plants, curbs, pavements, structures, utility lines and other Features on the highway right-of-way and adjacent property shall be protected. Any damage incurred while performing work underthis section shall be repaired immediately.

R614-4 METHOD OF MEASUREMENT

R614-4.01 Trees

The quantity to be measured for payment shall be the number of trees pruned, removed, or relocated. All trees shall be measured before they are cut, with measurement being made 4 feet 6 inches above the ground, commonly referred to as DBH (Diameter at Breast Height).

R614-4.02 Plants

The quantity to be measured for payment shall be the number of plants pruned, removed, or relocated.

R614-4.03 Stump Removal

The quantity to be measured for payment shall be the number of stumps removed. Stumps removed under this item shall be limited to existing stumps without plants, and having a minimum diameter of 6 inches at the top of the exposed portion of the stump.

R614-5 BASIS OF PAYMENT

R614-5.01 General All Items

Payment for each item of work will be based on the unit price bid, which payment shall constitute full compensation for furnishing all labor, material and equipment necessary to complete the work.

When plants and their respective stumps are specified for removal, payment for each plant removal shall include the removal of the respective stump.

Removal of existing stumps without plants, shall be paid for separately.

R614-5.02 Tree and Stump Removal

Removal of trees and stumps less than 6 inches in diameter will be paid for under Section R203.

R614-5.03 Plant Removal

Removal of plants will be paid for under either NYSDOT Section 201, Section R203, or Section R614, as indicated on the plans.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R614.04	Prune Existing Tree	Each
R614.05	Tree Removal - 6" up to 12" DBH	Each
R614.06	Tree Removal - 12" up to 18" DBH	Each
R614.07	Tree Removal - 18" up to 24" DBH	Each
R614.08	Tree Removal - 24" up to 30" DBH	Each
R614.09	Tree Removal - 30" up to 36" DBH	Each
R614.10	Tree Removal - 36" up to 42" DBH	Each
R614.11	Tree Removal - 42" up to 48" DBH	Each
R614.12	Tree Removal - 48" and over DBH	Each
R614.13	Tree Relocation - 1" up to 4" DBH	Each
R614.14	Tree Relocation - 4" up to 8" DBH	Each
R614.15	Prune Existing Plant	Each
R614.16	Plant Removal	Each
R614.17	Plant Relocation	Each
R614.18	Stump Removal - 6" up to 12" Diameter	Each
R614.19	Stump Removal - 12" up to 24" Diameter	Each
R614.20	Stump Removal - 24" up to 36" Diameter	Each
R614.21	Stump Removal - 36" up to 48" Diameter	Each
R614.22	Stump Removal - 48" Diameter and over	Each

SECTION R615 - LANDSCAPE MISCELLANEOUS

R615-1 DESCRIPTION

The work shall consist of installing steel and timber bollards, pipe bumper rail, ryerson edging, timber curb, lane stanchion, wire core rope, linked chain, galvanized cable, and benches as shown on the plans and as directed by the Project Manager.

R615-2 MATERIALS

R615-2.01 Steel Bollards

Steel bollards shall be 4 inch or 6 inch outside diameter, 6 feet 6 inches long, new galvanized steel pipe with steel acorn caps, painted flat black. Chain loops shall be 1/4 inch diameter by 2 inch galvanized steel welded to the bollard. Chain loops will be installed only in locations as shown on the plans.

R615-2.02 Pipe Bumper Rail

Pipe bumper rail shall be 4 inch outside diameter, 4 feet 6 inches long, extra-strength hot dip galvanized steel pipe conforming to ASTM A120.

R615-2.03 Ryerson Edging

Ryerson edging shall be Ryerson Landscape edging, 3/16 inch by 4 inch, minimum 3 feet long, as manufactured by Ryerson Steel Company, or approved equivalent.

R615-2.04 Timber Curb

Timber curb shall be Grade 1 Hardwood or Southern Yellow Pine, 6 inch by 6 inch, with a minimum length of 3 feet, pressure treated CCA preservative to 0.4 retention, or approved equivalent.

Pins for fastening shall be 5/8 inch rebars cut to 2 foot lengths.

R615-2.05 Timber Bollards

Timber bollards shall be Grade 1 Hardwood, or Southern Yellow Pine, 6 inch by 6 inch or 8 inch by 8 inch, 6 feet 6 inches long with angled top, pressure impregnated with CCA preservative, or approved equivalent.

R615-2.06 Linked Chain

Linked chain shall be 3/8 inch, hot dip galvanized for use with 8 inch by 8 inch timber bollards. Eye bolts shall be 3/8 inch by 8 inch hot dip galvanized.

R615-2.07 Cable

Cable shall be 1/2 inch, standard galvanized common strand, for use with 6 inch by 6 inch timber bollards. Cable clips shall be 1/2 inch standard cable clips, to receive 1/2 inch cable.

R615-2.08 Bench

Bench shall be Model 3378 as manufactured by Kenneth Lynch and Son, or approved equivalent. The bench shall be 6 feet long with wood seats and back. The metal portions of the bench shall be painted black by the manufacturer.

The bench seat shall be constructed from purpleheart or approved substitute. The word "Rochester" shall be cast in each bench leg.

Anchor bolts shall be 5/8 inch by 4-1/4 inch long steel Red Head Phillips Sleeve Anchors as manufactured by ITT Phillips Drill Division (Catalogue No. HN-5842, Hex Nut), or approved equivalent.

Paint shall conform to Rustoleum - flat black, or approved equivalent.

R615-2.09 Park Bench

Park bench shall be Model 3.12 Balustrade outdoor, purple heart wood bench as manufactured by Landscape Forms, or approved equivalent.

R615-2.10 Classic Victorian Bench

Classic victorian benches shall be Model 120-006 as manufactured by Mexico Forge, or approved equivalent.

R615-2.11 Concrete

Concrete shall be Class K conforming to the requirements of Section R504.

R615-2.12 Gravel

Gravel shall be subbase course Type 1 conforming to the requirements of NYSDOT Section 304.

R615-3 CONSTRUCTION DETAILS

R615-3.01 Steel Bollard

Tops of all bollards shall be uniform in height and line. Interior surface of post cap in contact with the bollard shall be coated with epoxy, prior to being wedged in place. Prior to installation of the post cap, the bollard shall be filled with concrete. If required, chain loops shall be welded onto the bollard, with the top of the chain loop being 2 inches down from the top of the bollard.

Bollards shall be set in a concrete footing, 3 feet deep, with 3 inch all around encasement, on a 6 inch bed of gravel. Top of footing shall be flush with finished grade in paved areas and domed in grass areas.

R615-3.02 Pipe Bumper Rail

Vertical members shall be placed 10 foot on center. The top of the vertical member shall be cut to accommodate the horizontal members.

Horizontal members shall be welded to each vertical member. The weld areas shall be cleaned, and one coat of silver or aluminized paint, compatible with galvanized surface, applied.

Vertical members shall be set in a concrete footing, 3 feet deep, with 3 inch all around encasement, on a 6 inch bed of gravel. Top of footing shall be domed. Height of top rail above finished grade shall be 1 foot 6 inches.

R615-3.03 Reset Existing Pipe Bumper Rail

Existing pipe bumper rail shall be removed and reinstalled. Existing pipe bumper rail shall be cleaned of all extraneous material.

Where a portion of an existing pipe bumper rail is to be reset, the rail shall be separated at the junction point of a horizontal member with a vertical member. Before the horizontal member is rewelded to the vertical member, the areas shall be cleaned, and one coat of silver or aluminized paint compatible with galvanized surface, applied.

Vertical members shall be set in a concrete footing, 3 feet deep, with 3 inch all around encasement, on a 6 inch bed of gravel. Top of footing shall be domed. Height of top rail above finished grade shall be 1 foot 6 inches.

R615-3.04 Ryerson Edging

Edging shall be installed uniformly and flush to the finished grade. Edging shall be installed to line and grade with standard ryerson stakes set flush to the edging. All bends are to be preformed to prevent kinking. All sharp edges and burrs shall be removed, and exposed metal shall be painted to match factory coat.

The edging shall be protected and kept in proper alignment and good condition until the completion of the contract.

R615-3.05 Timber Curb

Timbers shall be installed to line and grade, and parallel to the edge of the parking lot. Exposed end of the end timber shall be cut at a 45° angle. Timbers shall be predrilled on a bias in order to receive rebar pins.

Timbers shall be pinned with a minimum of three rebars per 7 foot length, and two rebars for 3 to 6 foot lengths. Rebars shall be driven through the timber and into the ground. The top of the rebars shall be deformed so the top does not go into the timber.

R615-3.06 Timber Bollard

Timber bollards shall be uniform in line and height. Bollards shall be installed on equal spacing, in a concrete footing, 3 feet deep, with 3 inch all around encasement, on a 6 inch bed of gravel. Top of the footing shall be domed.

R615-3.07 Linked Chain

The right end of the chain shall be fastened with split link to an eye bolt installed on the bollard, with a maximum 6 inch sag in the midpoint of the chain.

R615-3.08 Cable

Cable shall pass through each post to form a continuous rail with a maximum 2 inch sag in the midpoint of the cable. Cut ends of cable to be securely bound to prevent unravelling.

R615-3.09 Benches

Bench shall be set level and trued vertical, with all items and fittings, as per manufacturer's latest instructions and as approved by the Project Manager.

R615-4 METHOD OF MEASUREMENT

R615-4.01 Steel Bollards, Timber Bollards, Benches

The quantity to be measured for payment shall be the number of each item furnished and installed.

R615-4.02 Pipe Bumper Rail, Ryerson Edging, Timber Curb, Linked Chain, Cable

The quantity to be measured for payment shall be the number of linear feet of each item furnished and installed.

R615-5 BASIS OF PAYMENT

The unit price bid shall include the cost of: furnishing and installing all materials including but not limited to steel pipe, acorn caps, pipe sleeves, chain loops, rebars, twister plates, timber, ryerson edging, linked chain, cable, eye bolts, clips, benches, anchor bolts; painting; excavation; concrete footings; gravel; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R615.05	4" Bollard	Each
R615.06	6" Bollard	Each
R615.07	Pipe Bumper Rail	Linear Foot
R615.08	Reset Existing Pipe Bumper Rail	Linear Foot
R615.09	Ryerson Edging	Linear Foot
R615.10	Timber Curb	Linear Foot
R615.11	6 "x 6" Timber Bollard	Each
R615.12	8" x 8" Timber Bollard	Each

ITEM NO.	ITEM	PAY UNIT
R615.13	3/8" Galvanized Linked Chain	Linear Foot
R615.14	1/2" Galvanized Cable	Linear Foot
R615.15	Bench	Each
R615.16	Park Bench	Each
R615.17	Classic Victorian Bench	Each

SECTION R616 - TREE PLANTER

R616-1 DESCRIPTION

The work shall consist of the installation or resetting of stone, brick or cast iron tree planters as shown on the plans and as directed by the Project Manager.

R616-2 MATERIALS

R616-2.01 Stone Paving Blocks

Stone paving blocks shall be of the sizes indicated on the detail drawings and shall conform to the requirements of NYSDOT Section 714-01 for granite curb with the following modifications:

A.1. The exposed face of the blocks shall have no projection greater than 1/4 inch or depression greater than 1/2 inch beyond a horizontal plane on line with the finished grade.

A.2. Blocks shall be rectangular in cross section with substantially straight edges and square corners.

R616-2.02 Brick Paving Blocks

Brick paving blocks shall be of the sizes and colors indicated on the detail drawings and shall conform to the requirements of NYSDOT Section 704-08.

R616-2.03 Cushion Sand

Cushion sand shall conform to the requirements of NYSDOT Section 703-06.

R616-2.04 Tree Grates and Frames

Tree grate and frame shall be as indicated on the plans. Frames and grates shall conform to the requirements of NYSDOT Section 715-05. Grates are to be shop coated with Rustoleum - flat black, or approved equivalent.

R616-3 CONSTRUCTION DETAILS

R616-3.01 Stone/Brick Tree Planter

Excavate around the tree to the required depth and place a 3 inch sand bed. The sand shall be evenly graded, moistened, and compacted by means of two passes over the entire area with a mechanical tamper. The stone/brick blocks shall be set in a running bond pattern, hand tight, on the sand bed. Sand shall be placed within the joints until the joints are full, and any excess sand removed.

R616-3.02 Cast Iron Tree Planter

The frame shall be set in the surrounding sidewalk prior to pouring of concrete. The grate shall be reinstalled onto the frame, and shall not protrude above the level of the sidewalk. Brick supports will be required for tree grates that are installed in an existing sidewalk area, or an asphalt sidewalk area.

R616-3.03 Reset Stone/Brick Tree Planter

The existing block pavers/bricks shall be removed from the tree pit. Excavate and regrade the subbase as necessary and place a 3 inch sand bed. The sand shall be evenly graded, moistened, and compacted by means of two passes over the entire area with a mechanical tamper. The block pavers//brick shall be reset in a running bond pattern, hand tight, on the sand bed. Sand shall be placed within the joints until the joints are full, and any excess sand removed.

R616-3.04 Reset Cast Iron Tree Planter

The existing grate and/or frame shall be removed from the tree pit. Excavate and regrade the subbase as necessary. The frame shall be set in the surrounding sidewalk prior to pouring of concrete. The grate shall be reinstalled on the frame, the grate shall not protrude above the level of the sidewalk.

R616-4 METHOD OF MEASUREMENT

R616-4.01 Stone/Brick Tree Planter

The quantity to be measured for payment shall be the number of square feet of tree planters installed or reset.

R616-4.02 Cast Iron Tree Planter

The quantity to be measured for payment shall be the number of tree grates with or without frames installed or reset.

R616-5 BASIS OF PAYMENT

R616-5.01 Stone/Brick Tree Planter

The unit price bid shall include the cost of: excavation; furnishing, placing and compacting the sand base; furnishing and placing the stone/brick blocks; and furnishing all labor, material and equipment necessary to complete the work.

R616-5.02 Cast Iron Tree Planter - Frame and Grate

The unit price bid shall include the cost of: excavation; furnishing and placing the frame and grate; placement of the frame within the concrete sidewalk; and furnishing all labor, material and equipment necessary to complete the work.

R616-5.03 Cast Iron Tree Planter - Grate

The unit price bid shall include the cost of: excavation; furnishing and placing the grate; brick supports where required; and furnishing all labor, material and equipment necessary to complete the work.

R616-5.04 Reset Stone/Brick Tree Planter

The unit price bid shall include the cost of: excavation; regrading existing subbase; furnishing, placing, and compacting sand base; removing, storing, cleaning, and resetting existing stone/brick blocks; and furnishing all labor, material and equipment necessary to do the work

R616-5.05 Reset Cast Iron Tree Planter

The unit price bid shall include the cost of: excavation; regrading existing subbase; removing storing, cleaning, and reinstalling the grate and/or frame; placement of the frame within the concrete sidewalk; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R616.01	Stone Tree Planter	Square Foot
R616.02	Brick Tree Planter	Square Foot
R616.03XX	X' x X' Frame and Grate Tree Planter	Each
R616.04XX	X' x X' Grate Tree Planter	Each
R616.05	Reset Existing Stone Tree Planter	Square Foot
R616.06	Reset Existing Brick Tree Planter	Square Foot
R616.07	Reset Existing Frame and Grate Tree Planter	Each
R616.08	Reset Existing Grate Tree Planter	Each

SECTION R619 - MAINTENANCE AND PROTECTION OF TRAFFIC

R619 GENERAL

The work shall conform to the requirements of NYSDOT Section 619 with the following modifications:

R619-1 DESCRIPTION

Add a new subsection directly after NYSDOT Section 619-1.13, as follows:

R619-1.14 Project Signs

Special project signs shall be furnished and installed, as shown on the detail drawings, at the site of all projects. The number of project signs required shall be as indicated on the plans.

R619-2 MATERIALS

Add a new subsection directly after NYSDOT Section 619-2.08, as follows:

R619-2.09 Project Signs

The sign board shall be constructed of duraply or A-A exterior grade plywood. Reflex blue exterior enamel shall be used for the base coat, white exterior enamel for all letters.

Letters shall be helvetica medium style and of sizes as shown on the detail drawings.

R619-3 CONSTRUCTION DETAILS

Add a new subsection directly after NYSDOT Section 619-3.101, as follows:

R619-3.11 Project Signs

The base coat of paint shall be applied to both sides and all edges. Lettering shall be done by one of the following methods: silk screen process, diecut vinyl letters (permanent adhesive), hand lettering, or stencil. Letter size, positioning and style shall be as shown on the detail drawings. The "City" signature shall be reproduced exactly as shown on the detail drawings, which if required will be provided by the City prior to sign fabrication.

The project signs shall be mounted on their own posts or barricades, and are to be securely and soundly constructed and mounted. Project signs are not to be mounted on buildings, walls, fences, utility poles, traffic sign posts, or trees. The bottom of the sign board must be at least 5 feet above grade, and the sign is to be located such as not to impair in any way or manner the visual sight distance of both vehicular and pedestrian traffic. Fastening devices that appear on the face of the sign shall be painted reflex blue to match the background color. No fastening devices may enter into or cover any area of the lettering.

The project signs shall be displayed at the project site until final acceptance of the project by the City. Upon final acceptance, Project Signs shall be removed by the Contractor and delivered to a City storage area as ordered by the Project Manager

R619-5 BASIS OF PAYMENT

Replace NYSDOT Section 619-5 General in its entirety with the following:

General. No payment will be made under Basic Maintenance and Protection of Traffic for each calendar day during which there are substantial deficiencies in compliance with the specification requirements of any subsection of NYSDOT Section 619 and Section R619, as determined by the Project Manager.

In addition, liquidated damages will be assessed for each calendar day or part thereof that a cited deficiency resulting in non-payment, as prescribed herein, is not corrected or is permitted to recur.

The Project Manager will issue a written notice to the Contractor stating any deficiencies in compliance with NYSDOT Section 619 and Section R619, and the amount of time to be allowed to correct such deficiencies.

Liquidated damages will begin to apply following expiration of the time period stated in the written notice, and will be assessed as follows:

ORIGINAL CONTRACT AMOUNT		Liquidated
From More Than	**To and Including**	**Damages Per Calendar Day**
$0	$25,000	$50
25,000	50,000	75
50,000	100,000	200
100,000	500,000	300
500,000	2,000,000	500
2,000,000	5,000,000	600
5,000,000	10,000,000	800
10,000,000	15,000,000	1,000
15,000,000	OVER	***

***Will be as specified in the Contract Documents, Supplementary Terms and Conditions.

If the Contractor fails to maintain and protect traffic adequately and safely for a period of 24 hours, the Project Manager shall correct the adverse conditions by any means deemed appropriate, and shall deduct the cost of the corrective work from any monies due the Contractor. The cost of this work shall be in addition to the liquidated damages and non-payment for Basic Maintenance and Protection of Traffic listed above.

However, where major nonconformance with the requirements of this specification is noted by the Project Manager, and prompt Contractor compliance is deemed not to be obtainable, all contract work may be stopped by direct order of the Project Manager regardless of whether corrections are made by the Project Manger as stated in the paragraph above.

Add new subsections to NYSDOT Section 619-5.01, as follows:

R619-5.01 Basic Maintenance and Protection of Traffic

A. Project Signs

The cost of furnishing, erecting, relocating, maintaining, and removing the project signs and delivering the signs to a City storage area after completion of the work, shall be included in the lump sum price bid for Basic Maintenance and Protection of Traffic.

B. Construction Signs

Unless provided for under separate payment items in the proposal, the cost of furnishing, erecting, relocating and maintaining construction signs shall be included in the lump sum price bid for Basic Maintenance and Protection of Traffic.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R619.01	Basic Maintenance and Protection of Traffic	Lump Sum

SECTION R622 - SAW CUTTING

R622-1 DESCRIPTION

The work shall consist of saw cutting existing asphalt or concrete pavements, driveways or sidewalks as shown on the plans and as directed by the Project Manager.

R622-2 MATERIALS

None specified.

R622-3 CONSTRUCTION DETAILS

R622-3.01 General

Saw cutting shall be a minimum of 2 inches deep and be along neat, straight lines. Power saws and diamond or abrasive blades shall be those designed for such work. Care shall be taken not to disturb or damage pavement, curbing, and utilities that are scheduled to remain.

After the saw cut has been made, the cut shall be filled and levelled with sutable material so as to prevent a tripping hazard. No windrow of material to remain on the pavement after the cut has been made. Such material shall be removed at the end of the day.

R622-3.02 Full Depth Pavement Saw Cutting

Full depth pavement saw cutting shall consist of saw cutting an existing pavement through its base section, for those pavements that have an existing concrete, brick, telford stone, or stone block base. A concrete saw shall be used for full depth pavement saw cutting.

R622-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of linear feet of saw cutting completed.

R622-5 BASIS OF PAYMENT

The unit price bid for this item shall include the cost of: furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R622.01	2" Saw Cut - Asphalt	Linear Foot
R622.02	2" Saw Cut - Concrete	Linear Foot
R622.03	Full Depth Pavement Saw Cut	Linear Foot

SECTION R624 - CONCRETE GUTTER

R624-1 DESCRIPTION

The work shall consist of the construction of precast, conventionally formed or machine formed portland cement concrete gutters in reasonably close conformity with the lines and grades as shown on the plans and as directed by the Project Manager.

R624-2 MATERIALS

R624-2.01 Conventionally Formed Concrete Gutters

The materials and manufacture of concrete for this work shall meet the requirements for Class K concrete specified in Section R504.

R624-2.02 Precast Concrete Gutters

Precast concrete gutters shall comply with the requirements of NYSDOT Section 714-07.

R624-2.03 Machine Formed Concrete Gutter

The material requirements, mix preparation and manufacturing of concrete shall comply with the requirements for Class I concrete specified in NYSDOT Section 501.

R624-3 CONSTRUCTION DETAILS

R624-3.01 Conventionally Formed or Machine Formed Concrete Gutters

A. Conventionally Formed Concrete Gutters

Concrete gutters shall be constructed in 10 foot sections, of the shapes and types shown on the detail drawings. A steel separation plate 1/8 inch thick and cut to fit the section shall be used in each joint and removed as the concrete hardens, or the gutter may be constructed in alternate sections, with 24 hours to elapse before the construction of the intermediate sections. Excess concrete shall be screeded off perpendicular to the line of the gutter. All construction joints shall be poured full with an asphalt cement material meeting the requirements of NYSDOT Table 702-2, material designation 702-0700.

Curing of the gutters shall comply with the requirements of NYSDOT Section 502-3.10. Minimum curing periods for the various types of curing materials shall comply with the requirements of NYSDOT Table 502-2.

Expansion joints 3/4 inch in width shall be provided at 20 foot intervals and formed with premoulded bituminous joint filler. The filler material shall be cut to conform to the cross section of the concrete gutter. When concrete gutter is cast adjacent to cement concrete pavement constructed with expansion joints, expansion joints in the concrete gutter shall be located at the expansion joints in the pavement.

Forms shall be steel or wood, straight, free from warp, and of such construction that there will be no interference to inspection for grade or alignment. All forms shall extend for the full depth of the concrete gutter and shall be braced and secured adequately so that no displacement from alignment will occur during placing of concrete.

Concrete shall be placed in the forms in accordance with the applicable requirements of NYSDOT Section 555-3.04, and shall be compacted with an approved, immersion type mechanical vibrator. The vibrator shall be of the size and weight capable of thoroughly vibrating the entire mass without damaging or misaligning the forms. Forms shall be left in place for 24 hour or until the concrete has sufficiently hardened, so that they can be removed without injury to the concrete gutter.

The concrete gutter shall be kept clean, in proper alignment, and protected from damage until final acceptance of the work.

B. Machine Formed Concrete Gutter

Concrete curb shall be machine formed to the proper line and grade. The Project Manager may require a demonstration of the the specific equipment to be used, to ensure that it is capable of satisfactorily placing the concrete mix. No concrete curb shall be placed outside a tolerance of 1/2 inch of the established line or 1/4 inch of the established grade.

Contraction joints shall be formed or saw cut every 10 feet, to depths slightly below the surface of the adjacent pavement. When the concrete curb is constructed next to cement concrete pavement, the contraction joint in the concrete curb adjacent to the end of the pavement slab shall line up with the pavement joint. The saw cut or formed joints shall be left unfilled.

Expansion joints 3/4 inch in width shall be provided at 20 foot intervals and formed with premoulded bituminous joint filler. The filler material shall be cut to conform to the cross section of the concrete gutter. When concrete gutter is machine formed adjacent to cement concrete pavement constructed with expansion joints, expansion joints in the concrete gutter shall be located at the expansion joints in the pavement.

Curing of the concrete gutter shall comply with the requirements of NYSDOT Section 502-3.10. Minimum curing periods for the various types of curing materials shall comply with the requirements of NYSDOT Table 502-2.

The concrete gutter shall be kept clean, in proper alignment, and protected from damage until final acceptance of the work.

R624-3.02 Precast Concrete Gutters

The location of the gutter shall be excavated and graded to conform with the gutter cross section and line and grade. Gutter sections shall be placed to line and grade on a firm and dry subgrade. All joints shall be poured full with an asphalt filler material meeting the requirements of NYSDOT Table 702-5.

R624-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of linear feet of gutter constructed.

R624-5 BASIS OF PAYMENT

R624-5.01 General

The unit price bid shall include the cost of: furnishing and placing concrete; expansion joints; asphalt cement joint filler; curing and curing compounds; and furnishing all labor, material and equipment necessary to complete the work.

R624-5.02 Concrete Gutter - Gutter Replacement

The unit price bid per linear foot shall also include the cost of: removing and disposing existing concrete gutter; excavation; gravel necessary to adjust the subgrade elevation; Class C concrete foundation for pavement; asphalt tack coat; full depth pavement saw cutting; and granular backing material. Pay limits shall be per detail drawings.

When replacement item is being used within a reconstruction area, the pavement may be either concrete base or an asphalt base. The type of pavement base to be utilized shall be as noted on the plans. Where an asphalt pavement is to be used, the concrete base and asphalt tack coat will be replaced by a asphalt base course, a subbase course type 1 and type 2. The unit price bid per linear foot for replacement item will be the same regardless of which type of pavement base is used.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R624.05	Concrete Gutter	Linear Foot
R624.06	Precast Concrete Gutter	Linear Foot
R624.07	Concrete Gutter - Gutter Replacement	Linear Foot

SECTION R626 - SURVEY MONUMENTS

R626 GENERAL

As of the date of the start work order, the protection of all mouments on the job site is the responsibility of the General Contractor.

If a destroyed monument is found after this date, and the responsible party is unclear or undeterminable, the monument shall be replaced at the General Contractor's expense.

It shall be the Contractor's responsibility to contact the City Maps and Surveys Office to verify that the necessary ties have been taken on all existing monuments.

R626-1 DESCRIPTION

The work shall consist of the installation of new survey monuments; adjustment, or removal of existing survey monuments; installation of new survey monument frames and covers; resetting of existing frames and covers; and monumentation certification as shown on the plans and as directed by the City Maps and Surveys Office and the Project Manager.

R626-2 MATERIALS

R626-2.01 Horizontal Control Survey Monuments

Granite survey monuments shall be used for horizontal control only.

Granite survey monuments shall be from approved quarries. The granite shall be hard and durable, of a light color, free from seams which impair its structural integrity, and of a good, smooth splitting appearance. The monument shall be rough quarried to the dimensions as shown on the detail drawings. The top shall have a sawn or peen hammered finish and pitched to form a square or rectangle. Quarrying holes will be permitted only in the sides and bottom.

R626-2.02 Vertical Control Survey Monuments

Concrete survey monuments shall be used for vertical control only.

Concrete survey monuments and base shall be constructed of Class K concrete and shall have a 3/4 inch iron rod set in the center of the monument for its full length. The iron rod shall have a rounded top for a defined point of elevation and shall protrude 1/2 inch above the concrete as shown on the standard detail drawings.

R626-2.03 Frames and Covers

Frames and covers shall be cast iron as manufactured by Pohlman Foundry, or approved equivalent, as indicated by "Monuments and Monuments Covers" Standard Detail Drawing. Covers shall be 8-3/4 inch diameter by 1/2 inch thick. The cover is to be provided without a ribbed section and is to be 1/2 inch thick throughout.

R626-2.04 Select Granular Fill

Select granular fill shall conform to the requirements of Section R203.

R626-2.05 Concrete

Concrete shall be Class K conforming to the requirements of Section R504.

R626-3 CONSTRUCTION DETAILS

R626-3.01 General

Monuments shall be set under the direction of a Land Surveyor licensed to practice in the State of New York. The City of Rochester shall be provided with a certification stating that the monuments have been set (see Section R626-3.09).

The Contractor shall excavate for and install new monuments, frames and covers. The top of the monuments shall not be less than 4 inches or more than 6 inches below finished grade and the frame and cover shall be centered over the monument. Monument installation shall be coordinated with the installation of any surrounding work. The surface around the new monument shall be restored by the Contractor.

Special attention is directed to Section 104-22 of the Municipal Code of the City of Rochester, regarding requirements for a permit when working in the vicinity of a survey monument, as reiterated herein:

Section 104-22. Interference with survey monuments.

No person shall interfere with, disturb or move any survey monument without having obtained a permit in writing from the City Engineer. Interference for the purpose of this section shall be defined as any excavation work within three (3) feet of a survey monument or any extensive excavation work further than three (3) feet from a Survey monument that may affect the acccuracy of the monument.

A monument will be considered destroyed that has been:

1) Moved more than 0.02 of a foot in any direction from its City tied position.
2) Broken .
3) Disturbed to a point that the monument's position is no longer fixed or stable.
4) Removed from the ground for any reason.

In the event that survey monuments are destroyed during construction, the monument shall be replaced with a new unsed monument of the type specified in either R626-2.01 or R626-2.02. The theoretical position of the Horizontal Control Survey Monument shall be marked with a drill hole. An elevation of the Vertical Control Survey Monument will be established. Monument record information and certification cards shall be prepared and provided by the Contractor.

All expenses relating to destroyed monumentation are the responsibility of the Contractor.

R626-3.02 Drill Holes

Drill holes shall be 0.01 of a foot in diameter, a minimum of 0.03 of a foot deep and at least 1/2 inch from the outer edge of the monument.

R626-3.03 Theoretical Position

Monuments shall be placed and centered at the intersection of the two monument lines located 4 feet away from and parallel to the property lines (right-of-way lines), unless otherwise authorized in writing by the Maps and Surveys Office.

R626-3.04 New Monuments

For the purposes of this specification, a "New Monument" shall be defined as those monuments designated to be set by the Maps and Surveys Office, excluding those monuments to be set to replace destroyed monuments. New frames and covers shall be furnished and installed with new monument installations designated by the City Maps and Surveys Office.

R626-3.05 Vertical Adjustment of Horizontal and Vertical Control Monuments

Monument adjustment to take place only at the written direction of the City Maps and Surveys Office. Vertical adjustments performed without written authorization shall be considered distruction of the monument and require monument replacement and certification, see Section R626-3.01. The existing frame and cover shall be removed, and the top of the existing monument cut off. Adjustments of vertical control monuments must leave a 1/2 inch bar protrusion as per standard detail drawings. All monuments adjusted are to be not less than 4 inches or more than 6 inches below the new finished grade.

All extraneous material shall be removed from the frame and cover, and the frame and cover reset to meet the finished grade.

R626-3.06 Remove Existing and Destroyed Survey Monuments

The existing monument, frame, and cover shall be excavated for and removed. Existing monument, frame, and cover shall be cleaned of all extraneous material. The excavation shall be backfilled with select granular backfill and the disturbed surface area restored. Destroyed survey monuments shall be replaced with a new monument per Section R626-3.01.

Removed monuments, frames, and covers shall be safely stored on the site. The City Maps and Surveys Office shall be notified to arrange for pickup.

Monuments damaged due to Contractor negligence shall be replaced by the Contractor.

R626-3.07 New Frame and Cover

New frames and covers shall be furnished for survey monuments, to replace existing frames and covers at the direction of the Maps and Surveys Office. The new frame and cover shall be set to be even with the finished grade.

R626-3.08 Reset Existing Frame and Cover

The existing frame and cover shall be removed, and all extraneous material removed from the frame and cover. The existing frame and cover shall be reset to be even with the finished grade.

R626-3.09 Monumentation Certification

The Surveyor shall resurvey the Horizontal Control Monuments, and establish their accuracy with relation to the property lines (right-of-way lines), as noted below:

HORIZONTAL CONTROL SURVEY MONUMENTS

A. New Monuments. The Surveyor shall certify that the top center of the monument was set within 2 inches of the theoretical position. The theoretical position shall be at least 1/2 inch away from the outer edge of the monument. A minimum of three (3) swing ties to substantial, well defined and described, permanent points shall be provided.

B. New Monuments Set within New Streets to be Dedicated or Accepted by the City of Rochester. The Surveyor shall cerify that the monument was set with a drill hole in the correct theoretical position. The drill hole shall be at least 1/2 inch away from the outer edge of the monument. A minimum of three (3) swing ties to substantial, well defined and described, permanent points shall be provided.

C. Destroyed Monuments. The Surveyor shall certify that the monument was set with a drill hole in the correct theoretical position. The drill hole shall be at least 1/2 inch away from the outer edge of the monument. A minimum of three (3) swing ties to substantial, well defined and described, permanent points shall be provided.

VERTICAL CONTROL SURVEY MONUMENTS

D. Vertical Control Monuments to be established using second order accuracy. Elevation must be established using City of Rochester datum and running through a minimum of two (2) known City approved

bench marks. Certification card(s) will be required with a minimum of three (3) swing ties, elevation of new Vertical Control Monument, reference to vertical bench marks used, and copy of field notes.

The Project Manager shall be given, for approval by the City Maps and Surveys Office, a 3 inch by 5 inch card in the format shown on the detail drawings, for all monuments set, certifying that the monuments have been set and that the methods and accuracy achieved are to second order accuracy.

All original field notes shall be given to the Project Manager for transmittal to the City Maps and Surveys Office.

R626-3.10 Brass Survey Marker Installation

Brass Survey Markers may be installed at locations where physical conditions prohibit the installation of a granite survey monument. **Brass survey markers can be used only when approved for use by the City Maps and Surveys Office.** The use of brass survey markers without proper approval will result in the replacement of the marker with a new granite survey monument by the Contractor.

Brass survey markers will be supplied by the City Maps and Surveys Office, and installed by the Contractor. Installation of the marker will be as directed by a representative of the City Maps and Surveys Office.

METHOD OF MEASUREMENT

R626-4.01 Monuments

The quantity to be measured for payment shall be the number of monuments installed, adjusted, or removed. No payment will be made for destroyed monuments and their resurvey, (see Section R626-3.01).

R626-4.02 Frames and Covers

The quantity to be measured for payment shall be the number of frames and covers reset or replaced.

R626-5 BASIS OF PAYMENT

R626-5.01 General

The unit price bid shall include the cost of: all excavation, backfill, and surface restoration; preparation and submittal of monumentation certification record information and cards; furnishing and installing any necessary concrete and gravel; and furnishing all labor, material and equipment necessary to complete the work.

The position of monuments/markers to be set, or adjusted are to be established and set per these specifications, and proper certification of all work performed is to be provided. A partial payment of only 50 percent of the unit price bid will be made for new monuments, of which proper monumentation certification record information has not been submitted to and approved by the City Maps and Surveys Office. Failure to correct any erroneous or incomplete information, will result in forfeiture of the withheld 50 percent.

R626-5.02 Monuments - New

The unit price bid shall also include the cost of furnishing and installing new monuments, with frames and covers.

626-5.03 Monuments - Adjust

The unit price bid shall also include the cost of removing, cleaning, and reinstalling existing frames and covers; and cutting off top of existing monuments for adjustment.

R626-5.04 Monuments - Remove

The unit price bid shall also include the cost of removing, cleaning and storing existing monuments, frames and covers, and notification of the City Maps and Surveys Office to arrange for pickup.

R626-5.05 Frames and Covers

The unit price bid shall also include the cost of removing and resetting existing frames and covers; or replacing existing frames and covers with new frames and covers.

R626-5.06 Brass Survey Markers Installation

The unit price bid shall include the cost of: installing brass survey markers furnished by the City Maps and Surveys Office; preparation and submittal of monumentation certification record information and cards; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R626.02	Horizontal Control Survey Monument	Each
R626.03	Vertical Control Survey Monument	Each
R626.04	Adjust Existing Survey Monument	Each
R626.05	Remove Existing Survey Monument	Each
R626.06	New Frame and Cover	Each
R626.07	Reset Existing Frame and Cover	Each
R626.08	Brass Survey Marker Installation	Each

SECTION R642 - PAVEMENT MARKING PAINT

R642-1 DESCRIPTION

The work shall consist of the application of pavement marking paint at the locations and in accordance with patterns as shown on the plans and as directed by the Project Manager.

R642-2 MATERIALS

A quick drying, high visibility water soluble acrylic paint as manufactured by Wikel Manufacturing Company, or approved equivalent.

R642-3 CONSTRUCTION DETAILS

R642-3.01 General

The pavement shall be dry and cleaned of all dirt, dust, grease, water and other foreign material that may be detrimental to the adhesion of the paint.

The paint shall be mixed per manufacturer's specifications and as approved by the Project Manager.

Temperatures shall be a minimum of 50°F for application. Do not apply paint on wet surface, if rain is evident, or forecast, or the weather is otherwise unfavorable as determined by the Project Manager.

R642-3.02 Application of Pavement Marking

Painted pavement markings shall be applied with spray type striping machines (low pressure 20 to 30 pounds). The equipment shall be compatible with and suitable for the application of the type of paint being used.

Applied markings shall have clean cut edges, true and smooth alignment and shall be applied uniformly with a coverage of 400 to 450 linear feet of 4 inch wide stripes per gallon.

R642-4 METHOD OF MEASUREMENT

R642-4.01 Stripes

The quantity to be measured for payment shall be the number of linear feet of pavement stripes painted.

R642-4.02 Letters, Symbols

The quantity to be measured for payment shall be the number of pavement letters and symbols painted.

R642-5 BASIS OF PAYMENT

The unit price bid shall include the cost of: furnishing and applying marking paint; cleaning existing pavement; and furnishing all labor, material and equipment to satisfactorily complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R642.01XX	X" White Paint Pavement Stripe	Linear Foot
R642.02XX	X" Yellow Paint Pavement Stripe	Linear Foot
R642.03	White Paint Pavement Letter	Each
R642.04	Yellow Paint Pavement Letter	Each
R642.05	White Paint Pavement Symbol	Each
R642.06	Yellow Paint Pavement Symbol	Each

SECTION R643 - POST

R643-1 DESCRIPTION

The work shall consist of the installation of parking meter posts or sign post sleeves as shown on the plans and as directed by the Project Manager.

R643-2 MATERIALS

R643-2.01 Parking Meter Post and Sleeve

A. Sidewalk Area

Post shall be a standard 2 inch inside diameter galvanized steel pipe, 6 feet 6 inches long. Sleeve shall be 3 inch inside diameter galvanized steel pipe, 3 feet long.

B. Sidewalk Area - Over Structure

Post shall be a standard 2 inch inside diameter galvanized steel pipe, 4 feet 6 inches long, with 1/4 inch by 8 inch by 8 inch cast steel base plate welded to bottom of post, and four 1/4 inch by 2-1/2 inch by 2-1/2 inch cast steel fillets cut on a 45° angle, welded to both base plate and post.

C. Lawn Area

Post shall be a standard 2 inch inside diameter galvanized steel pipe, 7 feet 6 inches long, with two 12 inch long crossing pins placed in the end of the pipe.

R643-2.02 Sign Post Sleeve

Sleeve shall be standard 3 inch inside diameter galvanized steel pipe, 3 feet long.

R643-2.03 Concrete

Concrete shall be Class K conforming to the requirements of Section R504.

R643-2.04 Gravel

Gravel shall be subbase course Type 1 conforming to the requirements of NYSDOT Section 304.

R643-3 CONSTRUCTION DETAILS

R643-3.01 Parking Meter Post and Sleeve

A. Sidewalk Area

The top of the sleeve pipe shall be set flush with the finished grade, and shall be located 2 feet behind the face of curb. The sleeve pipe shall be encased within a 12 inch diameter concrete base, set on a 6 inch bed of gravel. The post shall be set within the sleeve pipe, and shall protrude 3 feet 6 inches above finished grade. The top end of the post shall be reamed so that no burrs will hamper parking meter installation. The sleeve pipe shall be installed prior to placement of new sidewalk.

B. Sidewalk Area - Over Structure

The post shall be located 2 feet behind the face of curb. The post shall be installed with the base plate and fillets welded onto the post. The weld areas shall be cleaned, and one coat of silver or aluminized paint compatible with galvanized surface, applied. The post shall be set within the placement of the new sidewalk, and the top end cut so that the top protrudes 3 feet 6 inches above finished grade. The top end of the post shall be reamed so that no burrs will hamper parking meter installation.

C. Lawn Area

The top of the post shall be set 3 feet 6 inches above finished grade, and shall be located 2 feet behind the face of curb. The post shall be set with two 12 inch crossing pins placed thru the bottom end of pole, encased within a 12 inch diameter concrete base, set on a 6 inch bed of gravel. A weep or breathing hole, 3/8 inch in diameter, is to be provided 3 inches above the top finished grade. The top end of the post shall be reamed so that no burrs will hamper parking meter installation. Upon completion of the work, the excavation shall be backfilled and the disturbed surface area restored.

R643-3.02 Sign Post Sleeve

The sleeve pipe shall be set flush with the finished grade, and shall be located a minimum of 2 feet behind the face of curb. The sleeve pipe shall be encased within a 12 inch diameter concrete base, set on a 6 inch bed of gravel. The top end of the pipe shall be reamed so that no burrs will hamper sign post installation. The sleeve pipe shall be installed prior to placement of new sidewalk.

R643-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of units installed.

R643-5 BASIS OF PAYMENT

R643-5.01 General All Items

The unit price bid for each unit shall include the cost of: furnishing and installing post, sleeve; base plate; fillets; welding; cleaning, cutting, and reaming of post; painting; concrete; gravel; hardware; excavation, backfill and surface restoration; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R643.01	Parking Meter Post - Sidewalk Area	Each
R643.02	Parking Meter Post - Over Structure	Each
R643.03	Parking Meter Post - Lawn Area	Each
R643.04	Sign Post Sleeve	Each

SECTION R653 - FIRE ALARM BASE

R653-1 DESCRIPTION

The work shall consist of the construction of fire alarm bases or the removal and reinstallation of existing fire alarm poles as shown on the plans and as directed by the Project Manager.

R653-2 MATERIALS

R653-2.01 Anchor Bolts, Template, Ground Rod and Conduit

Materials shall be furnished by the City Fire Department, Alarm Division.

R653-2.02 Concrete

Concrete shall be Class K conforming to the requirements of Section R504.

R653-3 CONSTRUCTION DETAILS

R653-3.01 Fire Alarm Base

Anchor bolts, template, ground rod, and conduit shall be picked up from the City Fire Department, Alarm Division. The concrete base shall be constructed with all required hardware installed, with concrete placement for the base conforming to the requirements of Section R504. Upon completion of the work, the excavation shall be backfilled and the disturbed surface area restored.

R653-3.02 Reset Existing Fire Alarm Pole

The existing pole and base shall be removed. Excavate and regrade the subbase as necessary, and construct a new concrete base. The existing pole shall be reinstalled on the new base. The existing base shall be disposed of in accordance with the requirements of Section R203.

R653-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of bases installed, or the number of poles reset.

R653-5 BASIS OF PAYMENT

R653-5.01 Fire Alarm Base

The unit price bid shall include the cost of: furnishing and placing concrete; picking up and installing the required anchor bolts, template, ground rod and conduit; excavation, backfill and surface restoration; and furnishing all labor, material and equipment necessary to complete the work.

R653-5.02 Reset Existing Fire Alarm Pole

The unit price bid shall include the cost of: removing and disposing existing concrete base; removing, storing, cleaning, and resetting existing fire alarm pole; regrading existing subbase; furnishing and placing new concrete base; picking up and installing the required anchor bolts, template, ground rod and conduit; excavation, backfill and surface restoration; and furnishing all labor, material and equipment necessary to do the work

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R653.01	Fire Alarm Base	Each
R653.02	Reset Existing Fire Alarm Pole	Each

SECTION R655 - FRAME AND GRATE

R655-1 DESCRIPTION

The work shall consist of the furnishing and installing frames, covers, and grates for drainage structures as shown on the plans and as directed by the Project Manager.

R655-2 MATERIALS

R655-2.01 Frame and Grate - Castings

All gratings, manhole covers, frames and curb boxes shall meet the requirements of NYSDOT Section 715-02, Steel Castings, Grade N-1; NYSDOT Section 715-05, Iron Castings, Class No. 30; or NYSDOT Section 715-09, Malleable Iron Castings, Grade 32510.

Frames, grates and appurtenant parts shall be delivered to the work site free of any coatings, unless otherwise specified.

R655-2.02 Frame and Grate - Fabricated

The frames, gratings and appurtenant parts shall be fabricated from steel conforming to ASTM A36.

Galvanizing shall be in accordance with NYSDOT Section 719-01, Type 1.

Welding shall conform to the requirements, specified in the New York State Steel Construction Manual, except that radiographic inspection will not be required.

R655-3 CONSTRUCTION DETAILS

R655-3.01 Frame, Cover, and Grate

Frames, covers and grates shall be placed true to line and grade. Suitable measures shall be taken to ensure that grates and covers shall have continuous, full and uniform bearing contact with their corresponding frames, and shall be nonrocking when in place and under the influence of traffic or other loads. Methods suitable to achieve secure nonrocking fits between grates, covers and their corresponding frames include, but are not limited to:

A. Ground mating surfaces
B. Machined and milled mating surfaces (horizontal and vertical)
C. Matchmarked elements
D. Locking elements

If matchmarked elements are utilized, care shall be taken to retain the identity of the elements in order to correctly match them and assure proper fits.

R655-3.02 Field Repairs for Improperly Fitting Systems

Field repair procedures for improperly fitting castings shall be as approved by the Project Manager. No field repairs of improperly fitting fabricated frames and grates shall be allowed. Field repairs may include grinding or proper welding techniques for the materials involved. Repairs that involve welding shall be allowed only on steel castings, not on iron, and only with prior approval of the Project Manager. Implemented repairs must result in systems whose constituent parts have full, uniform and even bearing contact on their respective underlying surfaces and that do not rock or move under the influence of traffic and other loads.

R655-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of each frame including cover or grate installed.

R655-5 BASIS OF PAYMENT

The unit price bid per each installation shall include the cost of: furnishing and installing the frame with cover or grate; any field repair work to render the frame and grate nonrocking; excavation, backfill, and surface restoration; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R655.03	Manhole Frame and Cover - Casting	Each
R655.04	Type A Catch Basin Frame and Grate - Casting	Each
R655.05	Type B Catch Basin Frame and Grate - Casting	Each
R655.06	Type A Catch Basin Frame and Grate - Fabricated	Each
R655.07	Type B Catch Basin Frame and Grate - Fabricated	Each

SECTION R671 - STREET LIGHTING SYSTEM

R671-1 DESCRIPTION

The work shall consist of adjusting or relocating existing conduit, pullboxes or light poles; installation of an operable street lighting system as shown on the plans and as directed by the Project Manager.

R671-2 MATERIALS

R671-2.01 Conduit

Conduit and fittings are to be Schedule 40, rigid, heavy wall polyvinyl chloride (PVC) conduit as specified by the Underwriters Laboratories (UL) Standard UL-651. The conduit is to meet the specifications included in NEMA Standard Specification TC-2 for electrical plastic conduit EPC-40.

Conduit and fittings used for riser conduit connections are to be Schedule 80, rigid, extra-heavy wall polyvinyl chloride (PVC) conduit as specified by the Underwriters Laboratories Standard UL-651. The conduit is to meet the specifications included in NEMA Standard Specification TC-2 for electrical plastic conduit EPC-80.

In cases of conflicting test requirements, the more stringent of the two test requirements is to be met.

The galvanized steel conduit specified to be used for roadway crossings is to conform to the requirements of NYSDOT Section 723-20.

R671-2.02 Cable

Cable is to be flame retardant, moisture and heat resistant, and encased in a thermoplastic insulated nylon jacket. The cable is to be approved for use in wet or dry locations and up to 75°C. The number and color of cables will be as shown on the schematic detail drawings. Substitution of colors for cables will not be allowed.

Cable in conduit is to be single conductor No. 6 AWG stranded copper conductor, Type THWN color coded.

Cable in the light pole is to be single conductor No. 10 AWG stranded copper conductor, Type THWN color coded.

R671-2.03 Hardware

A. Bolt connector is to be Burndy copper split bolt connector catalog No. KS20, or approved equivalent.

B. Fuse holder is to be Tron in-line fuse holder HEB-BW-RLC-B with two Buss insulating boots L Type 1A0512, or approved equivalent.

C. Fuse is to be Buss fuse Type KTK 13/32 inch by 1-1/2 inch, or approved equivalent.

D. 3" Threaded coupling and threaded nipple are to be 50,000 pounds per square inch galvanized steel conforming to ASTM A449.

E. 2" Threaded coupling and threaded nipple are to be 36,000 pounds per square inch galvanized steel conforming to ASTM A153.

F. Ground rod is to be 5/8 inch diameter, 8 foot long, copper bonded or hot dip galvanized steel.

G. Ground rod clamp is to be 5/8 inch Anderson GC-5, Blackburn J-AB 5/8 H, or approved equivalent.

H. Transformer tank ground is to be Anderson GTC 5-344, Blackburn TTC-2P, or approved equivalent.

R671-2.04 Warning Tape

Warning tape is to be red and marked "CAUTION ELECTRICAL CABLE" as manufactured by Allen System, Inc., or approved equivalent.

R671-2.05 Concrete Pullbox

Precast or cast-in-place pullboxes are to be made from Class K concrete, with cable bracket supports attached on the inside of all four walls. Iron castings for frames and covers are to conform to ASTM A48 Class 30 gray iron.

R671-2.06 Pole Base Foundation

Pole base foundations are to be cast-in-place units made of Class K concrete. Precast foundations will be allowed only as approved by the Project Manager, and are to be made of Class K concrete.

R671-2.07 Davit Pole

Pole, connection materials, pole base plate, and related appurtenances are to be made of 48,000 pounds per square inch galvanized steel, of the shape, size and dimensions as shown on the detail drawings.

The pole is to be 11 gauge, round, and the shaft tapered 0.14 inches per foot. The pole is to be of one piece construction having no transverse joints or welds, and no more than one longitudinal seam which is to be continuously welded, and ground or roller flush. Pole diameter is to be uniform at any cross section, and the pole straight.

The pole is to be provided with handhole, grounding nut, ground rod and wire, anchor bolt covers, and steel base plate electrically welded to the butt end of the pole. Base plate is to telescope the butt end of the pole shaft, and be continuously welded on the inside bottom and outside top.

Ground rod is to be 5/8 inch diameter, 8 foot long, copper bonded or hot dip galvanized steel. Ground rod clamp is to be 5/8 inch Anderson GC-5, Blackburn J-AB 5/8 H, or approved equivalent.

Poles including all component parts are to be hot-dip galvanized in accordance with the requirements of ASTM A123 and A153. All threaded holes are to be tapped, cleaned and greased with a silicon grease. If required, poles located on existing foundations are to have transformer bases sized to fit the existing bolt pattern.

Poles and all component parts are to conform to the requirements of NYSDOT Section 724-03.

R671-2.08 Materials Supplied by the City

If required to be installed by the Contractor, the City will provide the following items:

Luminaire
Fiberglass Light Pole
Anchor Bolts, Covers, Nuts, Washers
Photocontrol
Lamp
Fiberglass Pullbox
Fiberglass Handhole

The Contractor shall pick up and sign for all of the materials that are supplied by the City. The Street Lighting Office requires at least twenty-four (24) hours notice for material distribution.

R671-2.09 Slurry Bond Coat

Slurry bond coat is to be Acryl 60 as manufactured by Thoro System Products, or approved equivalent.

R671-2.10 Grout

Grout is to be nonshrink type grout in conformance with NYSDOT Section701-05. Grout is to have a minimum compressive strength of 4,000 pounds per square inch at 24 hours.

R671-2.11 Concrete

Concrete is to be Class K conforming to the requirements of SectionR504.

R671-2.12 Crushed Stone

Crushed stone is to be subbase course Type 2 conforming to the requirements of NYSDOT Section 304.

R671-2.13 Select Backfill

Select backfill shall be excavated material free from stones, sod and foreign materials. If suitable or sufficient quantities of excavated materials are not available, the Contractor is to provide select granular fill per Section R203.

R671-2.14 Materials to be UL Listed

All material required for the work is to be listed and rated by Underwriter Laboratories (UL) for its designated use. Materials are to be delivered to the job site in the original packaging, clearly labeled and bearing the manufacturer's identification and UL label.

R671-3 CONSTRUCTION DETAILS

R671-3.01 General

Manufacturer's shop drawings shall be submitted as required in the General Terms and Conditions Article 6, Section 6.13.

Pole base installation, relocation and/or adjustment, shall result in a completed base wih a smooth surface and shall be level, so that an anchor-based pole is plumb when installed. Minimal shimming will be allowed.

No split duct repairs on conduits will be allowed.

Excavation, backfill and surface restoration shall conform to the requirements of Section R206.

All electrical wiring, splices and connections shall be made by a licensed electrician.

R671-3.02 Conduit

The trench shall be excavated minimum of 2 feet below finished grade in the area between the pavement edge and sidewalk, and minimum of 3 feet below finished grade under roadways. The trench shall extend between all adjacent light poles, pullboxes, handholes and electrical service points. All driveways, roadways, sidewalks and trees shall be bored. Open trenching may be used instead of or in conjunction with boring, only as approved by the Project Manager. Before any tree roots are cut, the City Forester shall be notified.

The conduit shall be placed within the trench. Conduit installed under roadways shall extend at least 1 foot behind the face of the curb or as approved by the Project Manager. The conduit fittings shall be assembled in the trench in accordance with the manufacturer's latest instructions and as approved by the Project Manager. Warning tape shall be placed in the open trench approximately 6 inches above the conduit.

PVC conduit in open trench roadway crossings shall be encased with minimum of 3 inches of concrete, prior to backfilling. No backfilling shall be allowed until the concrete has set sufficiently to support the backfill.

All conduit connected to pullboxes and handholes shall be installed flush with the inside wall and a minimum of 3 inches above the bottom of the floor.

All conduit installed shall be tested for clear bore and correct installation, using a mandrel, brush and snake, before the installation will be accepted. The mandrel shall be turned approximately 85 percent of the internal diameter of the conduit to be tested. Two short wire brushes shall be included in the mandrel assembly. Snaking of conduits shall be done in the presence of the Project Manager. All conduit which rejects the mandrel shall be cleared. After providing a 250 pound nylon pull cord in the conduit, all empty conduit and duct openings shall be capped or plugged.

The excavation shall be backfilled and the disturbed surface area restored. Backfill shall be placed and tamped in 8 inch layers.

R671-3.03 Cable, Wiring, Connection to Service Points

Cable shall be installed in the conduit, and both the cable and conduit extended to the designated point of service. The in-line disconnecting device equipped with over current protection shall be connected in accordance with the following methods:

A. Underground Supplied Fixture Fed from RG&E Underground Distribution Facilities

The conduit shall be extended from the City's pullbox to the RG&E manhole/handhole.

All cable work will be performed by others unless specified.

If required, the cable shall be extended from the City's pullbox to the RG&E manhole/handhole, and the cable connected to the in-line disconnecting device located in the City's pullbox/handhole.

A sufficient amount of cable, coiled and protected, shall be left at the outside wall of RG&E's manhole/handhole which is to be of an adequate length to reach the center of the RG&E manhole/handhole. RG&E will locate the point of entry for the City, provide entry into the manhole/handhole, and make all cable and duct connections.

B. Underground Supplied Fixture Fed from RG&E Overhead Distribution Facilities

The conduit shall be extended from the City's pullbox to the RG&E pole as shown on the plans and as approved by the Project Manager. A 10 foot riser shall be installed on the pole.

All cable work will be performed by others unless specified.

If required, the cables shall be extended from the City's pullbox to the pole and up the riser, with an extra 20 foot length of each cable left coiled at the top of the riser. The cable shall be connected to the in-line disconnecting device located in the City's pullbox. RG&E will supply and place conductors above riser, and make all cable connections to the existing distribution facilities.

For those work items that require the existing cable to be disconnected and then reconnected, if the existing cable is not long enough to permit reconnection without splicing, the existing cable is to be replaced for its entire length. Splicing of the existing cable will not be permitted.

R671-3.04 Conduit Replacement

Existing conduit in roadways shall be replaced with galvanized steel conduit. The existing cable shall be disconnected at the nearest existing handhole, pullbox, or light pole and removed. If the cable is disconnected at a light pole, the light pole is to be removed from the pole base foundation first. The existing conduit that is to be replaced shall be disconnected, removed and disposed of, and new galvanized steel conduit placed within the trench. The new galvanized steel conduit shall be connected to the existing conduit on both sides of the trench. The Contractor shall install a 250 pound nylon cord in the conduit. Warning tape shall be placed in the open trench approximately

6 inches above the conduit. The existing light pole shall be reinstalled onto the pole base foundation. The excavation shall be backfilled and the disturbed surface area restored.

R671-3.05 Concrete Pullbox Installation

The pullbox shall be set on a 2 inch bed of crushed stone, with the cable bracket supports, frame and cover installed as required. Frame and cover shall be set in mortar, placed true to line and grade, and make full and even bearing on the underlying construction surface. The excavation shall be backfilled and the disturbed surface area restored.

R671-3.06 Fiberglass Pullbox/Handhole Installation

The pullbox/handhole shall be set on a 6 inch bed of crushed stone, with frame and cover installed as required. The excavation shall be backfilled and the disturbed area restored. Expansion joints shall be used for installation in sidewalks or driveway aprons.

R671-3.07 Concrete Pullbox Adjustment or Relocation

The existing pullbox shall be removed in such a manner that the pullbox and all cable and conduit contained therein are not damaged. The pullbox shall be reinstalled on a minimum 2 inch bed of crushed stone to its proper location and elevation, with the frame and cover reinstalled as required. If additional conduit and cable are needed those items shall be paid for under the appropriate pay item. The excavation shall be backfilled and the disturbed surface area restored.

For those existing pullboxes that do not already have cable bracket supports mounted on the walls, new cable bracket supports are to be obtained and attached to the inside of all four walls.

R671-3.08 Fiberglass Pullbox/Handhole Adjustment or Relocation

The existing pullbox/handhole shall be removed in such a manner that the pullbox/handhole and all cable and conduit contained therein are not damaged. The pullbox/handhole shall be reinstalled on a minimum 6 inch bed of crushed stone to its proper location and elevation, with the frame and cover reinstalled as required. If additional conduit and cable are needed those items shall be paid for under the appropriate pay item.The excavation shall be backfilled and the disturbed area restored. Expansion joints shall be used for installation in sidewalks and driveway aprons.

R671-3.09 Metal Pole Base Foundation

The pole base foundation shall be constructed with the required anchor rods, ground rod, conduit and any necessary hardware. The foundation shall be cast-in-place against undisturbed soil with the anchor rods, conduit and fittings held in place by a template. Anchor rods are to protrude above the top of the foundation a minimum of 3 inches, and conduit a minimum of 9 inches. Earth anchors may be used for casting the foundation against the undisturbed soil. Use of "Sonotubes" for forming foundations will not be allowed. The excavation shall be backfilled and the disturbed surface area restored.

Precast pole base foundations may be used only with the approval of the Project Manager. The precast pole base foundation shall be installed with the required anchor rods, conduit and fittings.

R671-3.10 Fiberglass Pole Base Foundation

The precast pole base foundation shall be installed with the required anchor rods, conduit and fittings. Anchor rods are to protrude above the top of the foundation a minimum of 2 inches, and conduit a minimum of 6 inches. The excavation shall be backfilled and the disturbed surface area restored.

Cast-in-place pole base foundations may be used only with the approval of the Project Manager. The foundation shall be cast-in-place against undisturbed soil with the anchor rods, conduit and fittings held in place by a template. Use of "Sonotubes" for forming foundations will not be allowed.

R671-3.11 Metal Pole Base Foundation Extension Adjustment

The existing cable shall be disconnected, and the existing light pole and luminaire removed in such a manner that they are not damaged. The existing base shall be scarified or removed to accommodate a minimum 6 inch thick Class K concrete cap. Before pouring the new cap, the top of the existing base shall be coated with an approved slurry bond coat. The existing conduit and anchor rods shall be extended as required with extensions and couplings. The extensions shall be of a sufficient length such that a minimum of 3 inches of the anchor rods, and 9 inches of the conduit shall protrude above the top of the new cap. The new cap shall be formed and poured onto the top of the existing base. The light pole and luminaire shall be reinstalled onto the base, the cable reconnected, and all wiring necessary shall be done to make the unit operable. The excavation shall be backfilled and the disturbed surface area restored.

R671-3.12 Fiberglass Pole Base Foundation Extension Adjustment

The existing cable shall be disconnected, and the existing light pole and luminaire removed in such a manner that they are not damaged. The existing base shall be scarified or removed to accommodate a minimum 5 inch thick Class K concrete cap. Before pouring the new cap, the top of the existing base shall be coated with an approved slurry bond coat. The existing conduit and anchor rods shall be extended as required with extensions and couplings. The extensions shall be of a sufficient length such that a minimum of 2 inches of the anchor rods, and 9 inches of the conduit shall protrude above the top of the new cap. The new cap shall be formed and poured onto the top of the existing base. The light pole and luminaire shall be reinstalled onto the base, the cable reconnected, and all wiring necessary shall be done to make the unit operable. The excavation shall be backfilled and the disturbed surface area restored.

R671-3.13 Pole Base Foundation Adjustment

The existing cable shall be disconnected, and the existing light pole and luminaire removed in such a manner that they are not damaged. The existing precast base shall be removed. Before removing the precast base, the existing conduit shall be disconnected from the base in such a manner as not to damage the existing cable contained therein. The precast base shall be reinstalled to its proper elevation, the existing conduit reconnected to the base, and the cable reinstalled. The light pole and luminaire shall be reinstalled onto the base, the cable reconnected, and all wiring necessary shall be done to make the unit operable. The excavation shall be backfilled and the disturbed surface area restored.

R671-3.10 Metal Pole Installation

The pole shall be installed onto the pole base foundation, with the required handhole and cover, ground nut, anchor rod nuts, covers, welds, any necessary hardware, and finger shims if required. Finger shims shall be used only at locations of anchor bolts, and shall be of a sufficient thickness so that only one finger shim is used at any location. Ground rod is to be driven into the ground adjacent to the foundation, and connected to the ground nut with a ground wire. The arm shall be orientated as shown on the detail drawings.

R671-3.15 Fiberglass Light Pole Installation

The light pole shall be installed onto the pole base foundation, with the required anchor rod nuts, shroud, any necessary hardware, and shims if required.

R671-3.16 Luminaire Installation

The luminaire, photocell and lamp shall be mounted onto the light pole. Cable shall be placed in the light pole, and all wiring necessary shall be done to make the unit operable.

The date of installation shall be indicated on each lamp and photocell by utilizing the coding provided by the manufacturer.

Each luminaire shall be inspected prior to mounting it to the light pole to ensure that the members are gasketed and securely bolted to form a rigid assembly, and that the ribs and refractor are correctly oriented as per the manufacturer's instructions and as approved by the Project Manager. The photocell shall face north.

R671-3.17 Light Pole Relocation - Cast-in-Place Base

The existing cable shall be disconnected, and the existing light pole and luminaire removed in such a manner that they are not damaged. The cast-in-place base shall be removed and disposed of. A new cast-in-place base shall be constructed per Section R671-3.07. The light pole and luminaire shall be reinstalled onto the new cast-in-place base, the cable reconnected, and all wiring necessary shall be done to make the unit operable. The excavation shall be backfilled and the disturbed surface area restored.

R671-3.18 Light Pole Relocation - Precast Base

The existing cable shall be disconnected, and the existing light pole, luminaire, and precast base removed in such a manner that they are not damaged. The precast base shall be reinstalled to its proper location and elevation. The light pole and luminaire shall be reinstalled onto the precast base, the cable reconnected, and all wiring necessary shall be done to make the unit operable. The excavation shall be backfilled and the disturbed surface area restored.

R671-3.19 Existing Light Pole and Base Removal

The existing metal light pole shall be removed in such a manner that the pole is not damaged. The pole shall be delivered to the City. Delivery shall occur at a predesignated time and place. A minimum of 18 inches shall be removed from the top of the existing pole base foundation, including conduit, cable and anchor rods. The excavation shall be backfilled and the disturbed surface area restored.

R671-3.20 Daily Cleanup of Work Site

All streets and sidewalks shall be cleaned of all spoil and debris including removal of old pole base foundations, at the end of each working day. Stockpiling of any material shall be only as approved by the Project Manager.

R671-4 METHOD OF MEASUREMENT

R671-4.01 Conduit and Cable

A. General

The quantity to be measured for payment shall be the number of linear feet of conduit or cable installed, or replaced.

Cable shall be measured as the actual number of linear feet of each individual cable that is installed.

No separate payment will be made for conduit and cable located within the light pole, and for conduit located within the pole base foundation.

B. Installation in Roadway

The quantity to be measured for payment shall be the number of linear feet of conduit installed from 1 foot behind the face of curb on both sides; or on streets with no curbs, from pullbox/handhole to the exterior of the pole base foundation.

C. Installation all Other Areas

The quantity to be measured for payment shall be the number of linear feet of conduit installed between the pullbox, handhole, manhole, or wood pole, and the exterior of the pole base foundation.

R671-4.02 All Other Items

The quantity to be measured for payment shall be the number of units installed, adjusted, relocated, or removed.

R671-5 BASIS OF PAYMENT

R671-5.01 Cable

The unit price bid shall include the cost of: furnishing and installing new cable and electrical conductors; all handling, cutting, fitting, testing; making all connections; and furnishing all labor, material and equipment necessary to complete the work.

R671-5.02 Conduit

The unit price bid shall include the cost of: furnishing and installing new conduit, fittings, warning tape, pull cord, couplings and insulating bushings, concrete encasement; connecting conduit to handholes, pullboxes, existing conduit, light poles, and other electrical equipment; all excavation including trenching or boring, backfill and surface restoration; and furnishing all labor, material and equipment necessary to complete the work.

R671-5.03 Conduit Replacement

The unit price bid shall include the cost of: disconnecting and removing existing cable; disconnecting, removing and disposing of existing conduit; furnishing, installing and connecting new galvanized steel conduit; reinstalling and reconnecting existing cable; removing and reinstalling existing light pole, luminaire; furnishing and installing warning tape; all excavation, backfill and surface restoration; and furnishing all labor, material and equipment necessary to complete the work.

R671-5.04 Concrete Pullbox

The unit price bid shall include the cost of: removing and reinstalling existing pullboxes with frame and cover; furnishing and installing new pullboxes with frame and cover, cable support brackets, crushed stone bedding; all excavation, backfill and surface estoration; and furnishing all labor, material and equipment necessary to complete the work.

R671-5.05 Fiberglass Pullbox/Handhole

The unit price bid shall include the cost of: removing and reinstalling existing pullboxes; picking up and installing new pullboxes; furnishing and installing crushed stone; all excavation, backfill, and surface restoration; and furnishing all labor, material and equipment necessary to complete the work.

The unit price bid shall include the cost of: removing and reinstalling existing handholes; picking up and installing new handholes; furnishing and installing crushed stone; all excavation, backfill, and surface restoration; and furnishing all labor, material and equipment necessary to complete the work.

R671-5.06 Pole Base Foundations

The unit price bid shall include the cost of: furnishing and installing foundation, conduit and fittings; picking up and installing anchor rods, nuts, washers; all excavation, backfill and surface restoration; and furnishing all labor, material and equipment necessary to complete the work.

R671-5.07 Pole Base Foundation Extension Adjustment

The unit price bid shall include the cost of: disconnecting existing cable; removing and reinstalling existing light pole, luminaire, finger shims, hardware, cable and electrical connectors, photocontrol, lamp; scarifying or removing a portion of the existing base; furnishing and installing concrete cap, slurry bond coat, conduit and anchor rod extensions and couplings; reconnecting cable, ground rod and wire; doing all wiring necessary to make the unit operable; all excavation, backfill and surface restoration; and furnishing all labor, material, and equipment necessary to complete the work.

R671-5.08 Pole Base Foundation Adjustment

The unit price bid shall include the cost of: disconnecting existing conduit and cable; removing and reinstalling existing davit light pole, luminaire, precast base, finger shims, hardware, cable and electrical connectors, photocontrol, lamp; furnishing and placing crushed stone; reconnecting cable, ground rod and wire; doing all wiring necessary to make the unit operable; all excavation, backfill and surface restoration; and furnishing all labor, material, and equipment necessary to complete the work.

R671-5.09 Metal Pole Installation

The unit price bid shall include the cost of: furnishing and installing new davit style light poles, handhole cover, ground rod, nut, clamp, wire, anchor rod nuts, washers, covers, transformer base, base plate, finger shims, welding; all excavation, backfill and surface restoration; and furnishing all labor, material and equipment necessary to complete the work.

R671-5.10 Fiberglass Pole Installation

The unit price bid shall include the cost of: picking up and installing the new fiberglass light poles and shroud; furnishing and installing finger shims, hardware, and furnishing all labor, material and equipment necessary to complete the work.

R671-5.11 Luminaire Installation

The unit price bid shall include the cost of: picking up and installing the luminaire, photocontrol, and lamp; doing all wiring necessary to make the unit operable; supplying and installing cable in the pole; and furnishing all labor, material and equipment necessary to complete the work

R671-5.12 Relocate Existing Light Pole - Cast-in-Place Base

The unit price bid shall include the cost of: disconnecting existing cable; removing and reinstalling existing light pole, luminaire, finger shims, hardware, cable and electrical connectors, photocontrol, lamp; removing and disposing of existing pole base foundation; furnishing and installing new pole base foundation, conduit; picking up and installing anchor rods, nuts, washers; reconnecting cable, ground rod and wire if required; doing all wiring necessary to make the unit operable; all excavation, backfill and surface restoration; and furnishing all labor, material and equipment necessary to complete the work.

If additional cable and conduit is necessary due to the light poles new location, the conduit and cable shall be paid for separately.

R671-5.13 Relocate Existing Light Pole - Precast Base

The unit price bid shall include the cost of: disconnecting existing cable; removing and reinstalling existing light pole, luminaire, precast base, finger shims, hardware, photocontrol, lamp; reconnecting cable, ground rod and wire if necessary; doing all the wiring necessary to make the unit operable; all excavation, backfill and surface restoration; and furnishing all labor, material and equipment necessary to complete the work.

If additional cable and conduit is necessary due to the light poles new location, the conduit and cable shall be paid for separately.

R671-5.14 Connection to RG&E Wood Pole

The unit price bid shall include the cost of: furnishing and installing riser conduit, hardware; and furnishing all labor, material and equipment necessary to complete the work. RG&E will make all cable connections to the distribution facilities.

R671-5.15 Existing Light Pole and Base Removal

The unit price bid shall include the cost of: removing light pole, top 18 inches of pole base foundation, anchor rods, conduit; delivering pole to designated facility; all excavation, backfill and surface restoration; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R671.01	Cable	Linear Foot
R671.02	3" PVC Conduit	Linear Foot

ITEM NO.	ITEM	PAY UNIT
R671.03	3" PVC Conduit - in Roadway	Linear Foot
R671.04	3" Galvanized Steel Conduit - in Roadway	Linear Foot
R671.05	Replace Existing Conduit w/ 3" Galvanized Steel Conduit - in Roadway	Linear Foot
R671.06	2" PVC Conduit	Linear Foot
R671.07	2" PVC Conduit - in Roadway	Linear Foot
R671.08	2" Galvanized Steel Conduit - in Roadway	Linear Foot
R671.09	Replace Existing Conduit with 2" Galvanized Steel Conduit - in Roadway	Linear Foot
R671.10	Concrete Pullbox (24")	Each
R671.11	Concrete Pullbox (30")	Each
R671.12	Adjust Existing Concrete Pullbox	Each
R671.13	Relocate Existing Concrete Pullbox	Each
R671.14	Fiberglass Pullbox/Handhole	Each
R671.15	Adjust Existing Fiberglass Pullbox/Handhole	Each
R671.16	Relocate Existing Fiberglass Pullbox/Handhole	Each
R671.17	Metal Pole Base Foundation	Each
R671.18	Metal Pole Base Foundation Extension Adjustment	Each
R671.19	Metal Pole Base Foundation Adjustment	Each
R671.20	Fiberglass Pole Base Foundation	Each
R671.21	Fiberglass Pole Base Extension Adjustment	Each
R671.22	Fiberglass Pole Base Foundation Adjustment	Each
R671.23	Davit Pole - 20'	Each
R671.24	Davit Pole - 25'	Each
R671.25	Davit Pole - 30'	Each
R671.26	Davit Pole - 35'	Each
R671.27	Davit Pole - 20' Twin	Each
R671.28	Davit Pole - 25' Twin	Each
R671.29	Davit Pole - 30' Twin	Each
R671.30	Davit Pole - 35' Twin	Each
R671.31	Fiberglass Light Pole	Each
R671.32	Luminaire Installation for Fiberglass Pole	Each
R671.33	Luminaire Installation for Metal Pole	Each
R671.34	Relocate Existing Metal Light Pole - Cast-in-Place Base	Each
R671.35	Relocate Existing Fiberglass Light Pole - Cast-in-Place Base	Each
R671.36	Relocate Existing Metal Light Pole - Precast Base	Each
R671.37	Relocate Existing Fiberglass Light Pole - Precast Base	Each
R671.38	Connection to RG&E Wood Pole	Each
R671.39	Remove Existing Metal Light Pole and Base	Each
R671.40	Remove Existing Fiberglass Light Pole and Base	Each

SECTION R685 - PLASTIC PAVEMENT MARKING

R685-1 DESCRIPTION

The work shall consist of the application of inlaid or overlaid plastic pavement markings at the locations and in accordance with patterns as shown on the plans and as directed by the Project Manager.

R685-2 MATERIALS

R685-2.01 Plastic Pavement Marking

Plastic pavement marking shall be preformed pavement marking tape, retro-reflective, with pressure sensitive adhesive, STAMARK Brand as manufactured by Minnesota Mining and Material Corporation (3M), or approved equivalent.

R685-2.02 Primer

Primer shall be of the type recommended by the manufacturer of the marking material. The primer shall be approved, by the Project Manager, prior to use. Request for approval shall be accompanied with technical data and instructions for use.

R685-3 CONSTRUCTION DETAILS

R685-3.01 Inlaid Plastic Pavement Marking

The marking material shall be installed on a freshly laid asphalt wearing surface by the inlay method as recommended by the manufacturer. The surface of the pavement must be compact and residual moisture evaporated prior to the application. The marking material shall be installed after the pavement has been compacted, but before final rolling. The temperature of the pavement surface shall not be lower than 80°F nor higher than 150°F at the time of the application.

Prior to rolling, the marking material shall be cut to the desired length, backing paper removed, and secured at intervals to hold the marking material in place. The marking material shall immediately be embedded in the pavement by use of a mechanical roller. The roller is not to reverse direction or turn while it is on the marking material. No water is to be applied to the surface of the pavement after the marking material has been laid on the asphalt. The marking material is to be flush with the adjacent pavement surface.

R685-3.02 Overlaid Plastic Pavement Marking

The marking material shall be installed on an existing asphalt wearing surface by the overlay method as recommended by the manufacturer. Appropriate primer shall be applied to the asphalt surface prior to tape application.

Minimum temperatures for application are 60°F for air and 70°F for roadway surface, with both temperatures rising. Markings should be applied during a season when daytime temperatures are above 70°F and nighttime lows are above 40°F.

The pavement shall be dry and cleaned of all dirt, dust, grease, water, and other foreign material that may be detrimental to the adhesion of the marking material. Marking material is not to be applied over other pavement markings. Primer is to have proper tack prior to application of the marking material, and is to be applied at the rates and in accordance with the recommendations of the manufacturer of the marking material.

Prior to rolling, the marking material shall be cut to the desired length, backing paper removed, and secured at intervals to hold the marking material in place. Marking material is to be thoroughly tamped by using a roller with a minimum 200 pound load. The roller is not to reverse direction or turn while it is on the marking material.

R685-4 METHOD OF MEASUREMENT

R685-4.01 Stripes

The quantity to be measured for payment shall be the number of linear feet of plastic pavement markings installed, as measured along the centerline of the stripe.

R685-4.02 Letters, Symbols

The quantity to be measured for payment shall be the number of plastic pavement marking letters and symbols installed.

R685-5 BASIS OF PAYMENT

The unit price bid shall include the cost of: furnishing, cutting, and applying plastic pavement markings; cleaning existing pavement; primer for overlaid markings; and furnishing all labor, material and equipment to satisfactorily complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R685.01XX	X" White Inlaid Plastic Pavement Marking Stripe	Linear Foot
R685.02XX	X" Yellow Inlaid Plastic Pavement Marking Stripe	Linear Foot
R685.03	White Inlaid Plastic Pavement Marking Letter	Each
R685.04	White Inlaid Plastic Pavement Marking Symbol	Each
R685.05XX	X" White Overlaid Plastic PavementMarking Stripe	Linear Foot
R685.06XX	X" Yellow Overlaid Plastic Pavement Marking Stripe	Linear Foot
R685.07	White Overlaid Plastic Pavement Marking Letter	Each
R685.08	White Overlaid Plastic Pavement Marking Symbol	Each

SECTION R687 - ALKYD THERMOPLASTIC PAVEMENT MARKING

R687-1 DESCRIPTION

The work shall consist of the installation of alkyd thermoplastic pavement markings at the locations and in accordance with the patterns as shown on the plans and as directed by the Project Manager.

R687-2 MATERIAL

R687-2.01 General

Alkyd thermoplastic pavement markings are to be a reflectorized pavement striping material of the type that is applied to a road surface in a molten state by spray or extrusion means. Following a surface application of glass spheres and upon cooling to normal temperatures, the resultant marking is to be an adherent reflectorized marking of the specified thickness and width, that is capable of resisting deformation by traffic. Applied material is to be impervious to degradation by motor oil, diesel fuel, grease deposits and ice-preventative chemicals.

Thermoplastic material is to be homogeneously composed of pigment, filler, resins, and glass reflectorizing spheres, and available in both white and yellow.

Thermoplastic material manufacturer has the option of formulating the material according to the manufacturers specifications. However, the solid synthetic resin is to be no less than 8 percent by weight of the entire material formulation, which is to consist solely of 100 percent solid modified maleic glycerol ester of resin. Physical and chemical properties contained in this specification will apply regardless of the type of formulation used.

Thermoplastic material manufacturer is to provide the Project Manager with a notarized written certificate stating that the thermoplastic material is in compliance with all requirements of this specification.

R687-2.02 Composition Requirements

Pigment, beads, and filler are to be uniformly dispersed in the resin. Thermoplastic material is to be free from all skins, dirt and foreign objects, and is to comply with the following requirements:

TABLE 1 COMPOSITION

COMPONENT PERCENT	BY WEIGHT
Binder	18 minimum
Glass Beads	24 minimum (30 optional)
Titanium Dioxide	8 minimum (10.12 optional)
Yellow Pigment (for yellow only)	4 minimum
Calcium Carbonate and Inert Filler	SEE NOTE

NOTE: Amount of calcium carbonate and inert fillers is to be at the option of the manufacturer, providing all other requirements of the specification are met. Total silica used in the formulation is to be in the form of spherical glass traffic beads.

Binder is to consist of a mixture of synthetic resins and high boiling point plasticizers, with one of the synthetic resins being solid at room temperature. A minimum of one-third of the binder composition is to be solid modified maleic glycerol ester of resin, which is to be no less than 8 percent by weight of the entire material formulation. Binder is not to contain petroleum based hydrocarbon resins or similar derivatives.

Titanium dioxide is to be in accordance with ASTM D 476-Type 2.

R687-2.03 Physical Properties

A. Color

Thermoplastic material, after heating for 4 hours at 425°F and cooled to 77°F, is to meet the following:

WHITE: Daylight reflectance at 45°F - 0°, 0.75 percent minimum
YELLOW: Daylight reflectance at 45° - 0°, 0.45 percent minimum, and is to match Federal Test Standard Number 595a - Color 13538.

B. Yellowness Index

White thermoplastic material is not to exceed a yellowness index of 0.15.

C. Drying Time

When applied at a temperature range of 412°F +12.5°F, and thickness of 0.090 inches (2.28mm) - thermoplastic material is to be completely solid and show no damaging effect from traffic after 2 minutes when the air temperature is at least 50°F, nor more than 15 minutes when the air temperature is 90°F or more.

D. Bond Strength

After heating he thermoplastic material at 425°F for 4 hours + 5 minutes, bond strength to portland cement concrete is to exceed 180 psi (1.24 MPa).

E. Impact Resistance

After heating the thermoplastic material at 425°F for 4 hours, impact resistance is to be a minimum of 10 inch pounds.

F. Softening Point

After heating the thermoplastic material at 425°F + 3°F for 4 hours + 5 minutes, and testing in accordance with ASTM D36, thermoplastic material is to have a softening point of 215°F + 15°F.

G. Specific Gravity

Specific gravity of the thermoplastic material is to be between 1.95 and 2.15.

H. Storage Life

Thermoplastic material is to meet the requirements of this specification for a period of 1 year. Thermoplastic material must also melt uniformly with no evidence of skins or unmelted particles. Any thermoplastic material not meeting the above requirements shall be replaced by the manufacturer. It is understood that granular alkyd material may not have a 1 year shelf life.

R687-2.04 Reflective Glass Spheres (Pre-Mix and Drop-On)

Glass spheres are to be colorless, clean, transparent, free from milkiness or excessive air bubbles, and essentially clean from surface scaring or scratching that might affect their function as a reflecting media, in accordance with AASHTO M247 Type I

Refractive index of the spheres is to be 1.50 minimum as determined by the liquid immersion method at 170°F.

Silica content of the glass spheres is to be not less than 80 percent.

Glass spheres for drop-on are to be treated with a moisture-proof coating.

R687-2.05 Application Properties

Thermoplastic material is to be readily applicable from the approved equipment, at temperatures between 400°F and 440°F, to produce a cross section of line as specified.

When heated during application, thermoplastic material is not to exude fumes which are toxic, obnoxious or injurious to persons or property.

Thermoplastic material is to be applied at a uniform thickness of not less than 0.125 inches nor more than 0.1875 inches. Application of additional glass spheres by drop-on method is to be at a rate of 7 pounds per 100 square feet.

Viscosity characteristics are to remain constant for up to 4 hours when the thermoplastic material is heated to the application temperature, and is to show like characteristics from batch to batch. Color is not to degrade below the reflectance limitations of the specifications after 4 hours at 425°F, nor is it to change from batch to batch.

R687-2.06 Packaging and Shipment

Thermoplastic material is to be block or granular packaged in moisture resistant corrugated containers or thermal degradable plastic bags, to which it is not to adhere during shipment or storage. Net package weight is to be approximately 50 pounds. Corrugated containers are to consist of blocks approximately 14 x 28 x 2-1/4 inches in size. Each container is to designate the color, manufacturer's name, batch number and date of manufacture. Each batch manufactured is to have its own separate number. Label shall warn the user that the material is to be heated in the range of between 400°F and 440°F during application.

R687-2.06 Methods of Sampling and Testing

Minimum trial batch size of thermoplastic material for testing is not to be less than 1 percent by weight of the the total weight of the thermoplastic material to be installed.

Thermoplastic material will be tested in accordance with the appropriate method as required in Federal Test Method Standard No. 141, and appropriate ASTM or AASHTO designation.

Thermoplastic material manufacturer is to provide a verifiable certified test report showing the acceptability of the binder system. An infra-red spectra of the extracted binder is to be compared to the haracteristic absorption bands of modified maleic glycerol ester of resin.

Properly formulated modified maleic glycerol ester of resin alkyd thermoplastic material is to remain hard after cooling. Properly formulated thermoplastic material will show a definite thin green to greenish amber oil film, or layer, on top of the thermoplastic material when the following test is applied: 100 grams of the sample thermoplastic material is to be heated to between 300°F and 330°F by a hot plate or oven, then 10 grams of 30 weight non-detergent Quaker State motor oil immediately added, and then the sample being further heated on a hot plate set at approximately 750°F while applying vigorous constant agitation until it has obtained a temperature of 425°F. A patty may be poured into a shallow lid or on a piece of tin to more easily observe the reaction.

Properly formulated modified maleic glycerol ester of resin spray alkyd thermoplastic material will further be tested by pouring a small patty on a flat surface. When cold, a small amount of 30 weight non-detergent Quaker State oil is to be deposited on the chip. The oil is to reside on the chip for at least 2 minutes, whereupon the sample is to be vigorously finger rubbed. Properly formulated thermoplastic material will not have any of the pigment rub off

onto the skin surface, thus showing its oil incompatibility. Improperly formulated thermoplastic material will either show a very light color on the skin surface, or the pigment will easily rub off onto the skin surface.

R687-3 CONSTRUCTION DETAILS

R687-3.01 Equipment

Equipment is to be as approved by the Project Manager prior to the start of work. Equipment is to be constructed as to assure continuous uniformity in the thickness and width of the thermoplastic material, and is to be equipped with a remotely controlled cut-off device, to provide clean square stripe ends. Glass bead distribution is to be uniform throughout the width and thickness of the thermoplastic material.

If an extrusion die (shoe) system is used, the front and both sides of the extrusion shaping system are to remain in full contact with the pavement at all times while dispensing thermoplastic material.

Heating kettle and applicators are to be equipped and constructed in such a manner as to meet the requirements of the National Board of Fire Underwriters, of the National Fire Protection Association of New York State, and of the local authorities.

Application equipment used to melt and install the thermoplastic material is to be constructed to provide continuous mixing and agitation of the thermoplastic material. All parts of the application equipment, including discharge apparatus, which come in contact with the thermoplastic material are to be designed and constructed to maintain the thermoplastic material at the required plastic temperature. Primary melting system is to be equipped with automatic thermostatic control devices for positive temperature and safety controls. Heating is to be by means of controlled heat transfer liquid or controlled flame heating, whereby flame does not touch underside or walls of thermoplastic melting vessel.

Equipment or procedures that may cause damage to the quality of the thermoplastic material by overheating, scorching or poor agitation, and thermoplastic material exposed to excessively long periods of heating and reheating, will be rejected.

R687-3.02 Application

A. General

Installed thermoplastic material is to be plainly visible to the motorist both day and night. Night time visibility is to be by retro-reflection induced by ordinary automobile headlights.

Sufficient personnel experienced in the handling and application of the thermoplastic material are to be utilized to assure that the work is done properly.

Contractor and the application personnel are to meet with the Project Manager prior to commencing any work on the project to review and approve the proposed application methods and equipment.

Application of the thermoplastic material is to done in the general direction of traffic flow.

All tracking marks, spilled thermoplastic material, and thermoplastic material applied in unauthorized areas are to be removed.

B. Traffic Control

Subject to Project Managers approval, all warning and directional signs and other traffic control devices required to direct, control and protect the traveling public while marking operations are in process, are to be in place prior to commencing work.

Marking operations and pavement markings are to be protected by placement of traffic control warning devices, including cones, barrels, signs, flagmen, or any other devices deemed by the Project Manager to be appropriate.

At the completion of each working day, all warning signs and channelizing devices are to be removed from the roadway.

A separate vehicle may be required to be used for applying the binder, which may require additional traffic control devices.

C. Surface Preparation

To insure maximum possible adhesion, prior to the application of the thermoplastic material, the pavement surface upon which the thermoplastic material is to be applied is to be properly cleaned of all grease, oil, mud, dust, dirt, grass, loose gravel and other deleterious material.

D. Seasonal and Weather Limitations

Thermoplastic material is to be applied upon dry pavement, when pavement surface temperature is at a minimum of 50°F, when ambient air temperature is at a minimum of 45°F and rising, by ribbon gun means when the pavement surface temperature is over 65°F.

E. Pre-Marking

Each installation is to be pre-marked prior to the application of the pavement marking. Actual placement of the pavement marking is not to be performed until the pre-marking application has been inspected and approved by the Project Manager.

F. Thermoplastic Material Application

Thermoplastic material is to be applied at the specified width, and at a rate to result in a thickness of not less than 0.125 inches nor more than 0.1875 inches. Application tolerance of 0.005 inches is acceptable. Thin application of thermoplastic material is to be replaced or otherwise corrected .

Pavement markings are to be straight or of a uniform curvature. Pavement markings are to uniformly conform with all pavement tangents, curves or transitions. Sufficient control points are to be provided to serve as guides for application of pavement markings. Pavement markings are not to be placed until the Project Manager has approved the proposed alignment, as indicated by the control guides set by the Contractor.

Finished lines are to be waveless and have well defined edges. Longitudinal lines shall be offset at least 2 inches from longitudinal construction joints of the pavement. Lateral deviation of the finished line is not to exceed at any point 1/2 inch from the proposed alignment. Pavement markings are not to be less in width nor more than 1/4 inch wider, than the dimension required. Any deviation that exceeds these tolerances will be replaced.

All special pavement markings, cross-walks, stop bars, letters, symbols, and similar patterns are to be placed with a portable applicator.

Pavement markings are to be applied with one pass of the application equipment, except for pavement markings that exceed 12 inches in width which may be applied by two passes of the application equipment. Letters and symbols are to conform to the size and shape as outlined in the NYSDOT Manual of Uniform Traffic Control Devices.

When formed into stripes, letters or symbols, the thermoplastic material must be readily renewable by placing a thin overlay of new thermoplastic material directly over an old line of thermoplastic material. New thermoplastic material is to be able to bond itself to the old line in such a manner that no splitting or separation takes place.

To avoid blistering and poor adhesion, thermoplastic material is to be applied to dry pavements in a melted state at a temperature between 400°F and 440°F. Application range rises with cooler road temperatures (upto 440°F), and lowers with warmer temperatures (down to 400°F). Application on portland cement concrete surfaces is to be at a temperature range of between 425°F and 440°F.

Thermoplastic material is to be heated uniformly throughout, and is to have a uniform disbursement of glass spheres when applied to the surface of the pavement.

At the time of the application and at final acceptance, the color of the white thermoplastic material is to be pure white. Color of the yellow thermoplastic materials is to be resonably close to Federal Standard Number 595a - Color 13538, and is to fall within the limits of the F.H.W.A. Highway Yellow Color Tolerance Chart, PR Color Number 1.

Openings in lines placed on the inside edge of super elevated curves may be required to prevent the ponding of water on the pavement surface. Openings are to be 6 inches in length and spaced at 20 foot intervals

G. Reflective Glass Spheres (Drop-On)

Glass spheres (drop-on)s are to be uniformly applied to the surface of the thermoplastic material by means of a pressurized bead applicator or other mechanical method. Glass spheres are to be applied immediately after the thermoplastic material is applied to the pavement surface and while it is still molten, so that the glass spheres will be held by and uniformly mechanically imbedded into the surface of the thermoplastic material.

R687-3.03 Observation Period

Following completion of the work and before final acceptance, there will be a 90 day observation period of the pavement markings.

During the observation period, the thermoplastic material furnished and installed is to be warranted against any failure due to blistering, bleeding, excessive cracking, staining, discoloration, oil content of the pavement materials, smearing or spreading under heat, deterioration due to contact of oil or gasoline drippings, chipping, spoiling, poor adhesion resulting from defective materials or methods of application, loss of reflectivity, and damage from traffic and wear, other than wear or removal by such devices as snow plows, chains or studded tires.

During the observation period installed pavement markings that did not perform satisfactorily due to defective materials, workmanship in manufacture, or application are to be replaced.

Replacement pavement markings are to be applied in accordance with the requirements specified within this specification. Replacement of pavement markings is to commence within 45 days of written notice of defect, and the process is to be continuously repeated until all of the applied pavement markings have been accepted as having been satisfactorily applied.

Traffic will be operated on the facility during the 90 day observation period.

R687-3.04 Warranty

Contractor is to guarantee to the City of Rochester to replace or renew, without cost to the City, any portion of the applied pavement markings which have not remained in place for a period of 24 months.

Contractor is to guarantee that the applied thermoplastic material will be impervious to degradation by motor oil, diesel fuel and grease deposits.

Replacement thermoplastic material installed under this guarantee is to carry the same warranty as the original thermoplastic material, commencing from the date the thermoplastic material is replaced.

R687-4 METHOD OF MEASUREMENT

R687-4.01 Stripes

The quantity to be measured for payment shall be the number of linear feet of alkyd thermoplastic pavement marking stripes installed, as measured along the centerline of the stripe.

R687-4.01 Letters, Symbols

The quantity to be measured for payment shall be the number of alkyd thermoplastic pavement marking letters and symbols installed.

R687-5 BASIS OF PAYMENT

The unit price bid shall include the cost of: furnishing and applying alkyd thermoplastic pavement marking material; sampling and testing; surface preparation; pre-marking; traffic control including traffic control devices; observation period and warranty; replacement of defective pavement markings; and furnishing all labor, material and equipment to satisfactorily complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R687.05XX	X" White Alkyd Thermoplastic Pavement Marking Stripe	Linear Foot
R687.06XX	X" Yellow Alkyd Thermoplastic Pavement Marking Stripe	Linear Foot
R687.07	White Alkyd Thermoplastic Pavement Marking Letter	Each
R687.08	White Alkyd Thermoplastic Pavement Marking Symbol	Each

SECTION R901 - DUCTILE IRON PIPE WATER MAIN AND FITTINGS

R901-1 DESCRIPTION

The work shall consist of the installation of ductile iron pipe water main as shown on the plans and as directed by the Project Manager.

R901-2 MATERIALS

R901-2.01 Pipe and Fittings

All pipe and fittings shall be of good quality, strong, of even grain, and soft enough to permit drilling and cutting. Each pipe shall be free from any defects which would make it unfit for the use intended. All pipe shall be straight, and a true circle in section with concentric inner and outer surfaces. Pipe to be cut during installation shall be fully gauged for field cutting. Pipe metal shall be made without any admixture of cinder iron or other inferior material.

Pipe shall be ductile iron pipe conforming to the latest requirements of ANSI/AWWA C151/A21.51. Pipe class thickness shall be Class 52 or 56, as indicated on the plans.

Fittings shall be ductile iron fittings conforming to the requirements of ANSI/AWWA C153/A21.53. Fittings shall equal or exceed the requirements of the main pipe and shall have a rated working pressure of 250 pounds per square inch.

Pipe and pipe fittings shall be cement mortar lined, double thickness, in accordance with the requirements of ANSI/AWWA C104/A21.4, with an asphalt coating on the inside and outside of the pipe.

Joints shall be rubber gasket push-on, mechanical joint, or mechanical joint anchoring type. All joints shall conform to the requirements of ANSI/AWWA C111/A21.11. Electrical conductivity for push-on and mechanical joints shall be maintained by the use of bronze wedges. Use two wedges per joint for pipe sizes up to 12 inches in diameter; and a minimum of four wedges per joint for all pipes over 12 inches in diameter. Lead tipped gaskets will not be allowed.

Mechanical joint anchoring pipe is required for hydrant branches in new water main construction.

All hardware used on water mains, pipe fittings, and appurtenances shall be made of cold formed, high strength, low-alloy steel (Cor-ten), ASTM A242.

The follower gland for mechanical joint pipe shall be made of ductile iron material conforming to the latest requirements of ANSI/ANWA C151/A21.51.

R901-2.02 Polyethylene Tube Encasement

Polyethylene tube encasement, 8 mil thick, and polyethylene adhesive tape shall be as required for pipe encasement. Material and installation procedures shall be as specified in ANSI/AWWA C105/A21.5.

R901-2.03 Warning Tape

Warning tape shall be a detectable, metallic-lamination tape, suitable for direct burial, as manufactured by Terra Tape, or approved equivalent. Tape shall be designed to locate and warn excavators of buried water lines. Tape shall be color coded blue and marked "CAUTION WATER LINE BURIED BELOW" in bold readable lettering.

R901-2.04 Material Certification

Manufacturer's and supplier's certifications shall be furnished to the Project Manager stating that all materials furnished have passed the acceptance tests listed in the appropriate specifications.

R901-2.05 Thrust Restraint

Concrete used for thrust blocks shall be Class K conforming to the requirements of Section R504. Concrete shall be central, transit, or truck mixed, and poured-in-place.

Push-on joints and mechanical joints restrained by utilizing tie rods and clamps, shall be subject to the approval of the Project Manager prior to their use in the work. Tie rods, clamps and all hardware shall conform to the requirements of ASTM A242. Tie rods are to be 3/4 inch in diameter. The number of tie rods to be used for restrained joints shall be as follows:

Pipe Size (Inches)	Number of Rods
4 to 12	2
16	4
20	6
24	8

Prior to backfilling, tie rods, clamps and all components of dissimilar metal used for restrained joints, shall receive a hand application of a Sikagard 62 protective coating as manufactured by Sika Corporation, or approved equivalent.

R901-2.06 Bedding and Backfill

Pipe bedding and cover shall be a sand material conforming to the requirements of Section R203.

Select backfill shall be locally excavated material determined suitable by the Project Manager to be used as backfill. It shall consist of hard durable materials and soil, free of organic material, debris, clay, frozen material and stone with any dimension greater than 4 inches.

Select granular backfill shall conform to the requirements of Section R203.

R901-2.07 Surface Restoration Materials

The following materials shall be used:

A. Subbase material Type 1 and Type 2 conforming to the requirements of NYSDOT Section 304.
B. Asphalt base course Type 1 conforming to the requirements of NYSDOT Section 403.
C. Asphalt binder course Type 3 conforming to the requirements of NYSDOT Section 403.
D. Asphalt surface course Type 7F conforming to the requirements of NYSDOT Section 403.
E. Concrete foundation for pavement, Class C or Class F, conforming to the requirements of NYSDOT Section 503.
F. Concrete sidewalk conforming to the requirements of Section R608.
G. Asphalt concrete sidewalks conforming to the requirements of Section R608.
H. Curbing conforming to the requirements of Section R609.
I. Seeding conforming to the requirements of Section R610.
J. Topsoil conforming to the requirements of NYSDOT Section 613.
K. Concrete gutters conforming to the requirements of Section R624.

R901-3 CONSTRUCTION DETAILS

R901-3.01 General

The location and disposition of all water services shall be verified before beginning work.

All work shall be coordinated with the Water Bureau. The Water Bureau will close all valves needed to isolate the section of the water main to be shut down. The Water Bureau shall be notified a minimum of 10 working days in advance of intent to do the work requiring the operation of valves and appurtenances; and a minimum of 2 working days advance notice when operation of valves and appurtenances is required for the actual work. All valves and appurtenances are to be operated only by authorized representatives of the Water Bureau.

Work shall be scheduled so as to maintain adequate water service. All water service interruptions shall be of a minimum duration, and shall be coordinated with the Water Bureau. The Water Bureau shall be notified a minimum of 2 working days in advance of the intent to discontinue water service in any water main or service. All affected water service customers shall be notified by the Contractor a minimum of 24 hours in advance of any service disruption. Temporary water service shall be provided to water service customers whose water service is disconnected for more than 24 hours, and when indicated in the Contract Documents. Methods of temporary service shall be in conformance with Section R916.

Whenever a water main shut down involves more than 25 customers and is to be more than 2 hours in duration, the shut down shall be performed between the hours of 10:00 p.m. and 6:00 a.m. Businesses that require water for their basic operation shall be provided with a temporary water supply, or the water main work requiring the water main shut down shall be coordinated with the affected business so that it occurs outside the normal operating hours of the business.

A permit is required from the Water Bureau to use water from fire hydrants. The permit requires the use of a meter and backflow preventer. The backflow preventer shall be supplied by the Contractor.

The Water Bureau dispatcher shall be immediately notified when existing hydrants are put out of service. The dispatcher shall inform the Fire Department, and the out of service hydrants shall be red tagged. The dispatcher shall be notified when hydrants are placed back in service.

Records of all new, renewed, and extended water services shall be provided. Such records shall identify for each service the address and coordinate location of the service, material used, the length and size of new copper service, and the location of the corporation stop and curb stop. This information shall be recorded on a standard water service card, as shown on the detail drawings. Water service cards shall be supplied by and obtained from the Water Bureau, and shall be submitted on a monthly basis to the Water Bureau Dispatcher, Water Bureau, 10 Felix Street, Rochester, New York.

Appropriate measures shall be taken to prevent dirt, debris, and surface water from entering the water main. Open pipe ends shall be plugged with watertight plugs whenever work is discontinued for any length of time, or when laying conditions may allow foreign matter to enter the pipe. The interior of the open pipe ends, and all new pipe used in making the installation, shall be swabbed with a 5 percent hypochlorite solution before installation.

A temporary pavement shall be placed in all water main trenches located within existing paved areas, immediately after backfilling the trench. Temporary pavement, Item No. R412.01, shall be as directed by the Project Manager.

R901-3.02 Installation

Water mains shall be installed to the required lines and depths as shown on the plans and as ordered by the Project Manager. The locations, lines and depths of the pipe lines, valves, and other appurtenances shown or specified are approximate only. Actual locations, lines and depths may be adjusted to meet field conditions at the time of installation as approved by the Project Engineer. Control points shall be carefully preserved.

Pipe and fittings shall be installed in accordance with the requirements of ANSI/AWWA C600, according to manufacturer's latest instructions and as approved by the Project Manager.

Pipe and fittings shall be handled in such a manner that the coating and lining are not damaged during their delivery, storage and installation. No plugging, filing, burning in or welding of pipe will be allowed to repair damaged pipe or fittings.

Pavement saw cutting shall be required prior to all work, except in areas of reconstruction. All street cuts shall be made by a pavement saw and shall conform to the requirements of Section R622.

Excavation shall be to the required alignment and width, and to a depth that will assure a minimum cover of 4 feet 6 inches over the top of a domestic water main, after construction has been completed. Minimum cover for holly water mains shall be 5 feet. Excavation shall conform to the requirements of Section R206. The trench shall be dewatered, and kept free of water at all times.

Where the trench bottom is determined to be unstable by the Project Manager, all unsuitable material shall be removed and replaced with select granular backfill. The unsuitable material shall be excavated to a width and depth as approved by the Project Manager. All unsuitable material shall be disposed of.

When rock is encountered, all rock shall be removed and disposed of to provide a minimum clearance around the pipe exterior of 12 inches along the sides of the pipe, and 6 inches along the bottom of the pipe.

Where watermain trenches are located in corrosive soil conditions, the watermain and service pipe shall be encased in a polyethylene encasement. Installation of the polyethylene encasement and pipe shall be in accordance with ANSI/AWWA C105/A21.5 and the pipe manufacturer's latest instructions and recommendations.

All tees, bends, offsets, and plugs shall be solidly braced to prevent any movement due to thrust pressure. Bracing shall be accomplished with the use of cast-in-place concrete between the fittings and undisturbed soil. Thrust block dimensions shall be as shown on the detail drawings. Anchor pipe or mechanically restrained joints, shall be used where required. Vertical bends shall require mechanical restraint in addition to concrete thrust blocks. Appropriate materials and installation methods shall be used for mechanically restrained joints.

For sewer crossings, there shall be a minimum of 1 foot 6 inches of vertical separation between new water mains and any existing or proposed sewers, as measured between the outsides of the respective pipes. One full standard length of water main pipe shall be centered over or under the sewer so that both joints will be as far as possible from the sewer. Where the crossing is less than 1 foot 6 inches, all water main pipe joints less than 10 feet horizontally from the sewer shall requrie "K"-krete encasement. The length of encasement shall be 2 feet minimum, centered on the pipe joint, and shall have a minimum thickness of 6 inches. In all cases, the water main shall not be less than 6 inches from the sewer. Where the water main passes under the sewer, adequate structural support shall be provided to protect the sewer. The sewer shall be provided with a minimum bedding 6 inches of "K"-krete. If approved by the Project Manager, a well compacted backfill of crushed stone (size designation 1, NYSDOT 703-02) may be substituted for the "K"-krete..

Minimum desirable or horizontal separation between parallel water mains and sewer pipes (including sewer manholes and vaults) is 10 feet, as measured between the outsides of the respective pipes, manholes and vaults. Where both the minimum horizontal and vertical separation of water mains and sewers can not be obtained, the new water main pipe joints shall require "K"-krete encasement to the dimensions given in the preceding paragraph.

The interiors of all appurtenances and sections of the water main that cannot be normally disinfected shall be swabbed with a 5 percent solution of hypochlorite before installation.

Disinfection/sampling taps shall be installed at the ends of all new water mains, and at any other locations as required by the Project Manager.

R901-3.03 Bedding and Backfill

Pipe bedding and cover shall be sand, and shall be to 12 inches minimum on each side of the pipe, 6 inches below the bottom of the pipe, and 12 inches above the top of the pipe. All pipe bedding and cover shall be compacted according to the requirements of Section R203. Bedding shall provide a solid bearing through the entire pipe length. Timber blocking shall not be used without the permission of the Project Manager. Timber blocking, if allowed in the work, shall be removed prior to trench backfilling.

Warning tape shall be placed in the open trench 12 inches above the water main. The tape shall run continuously along the centerline of the water main, with wording facing up.

Backfill under paved areas shall be select granular backfill, conforming to the requirements of Section R203. Backfill shall be placed according to the requirements of NYSDOT Section 203-3.15 with the following modifications:

A. Lift thickness shall not exceed 8 inches.
B. Minimum density for all backfill materials shall be 95 percent of Standard Proctor Maximum Density.

R901-3.04 Testing

A pressure test shall be conducted in the water main after all required appurtenances are installed. The length section to be tested will be as approved by the Project Manager. If conditions permit, the water main shall be tested before the trench is backfilled. The pressure test will be witnessed by the Project Manager.

The pressure test shall be done in accordance with the requirements of Section 4 of ANSI/AWWA C600. All testing equipment shall be properly calibrated for the work to be accomplished. Prior to the test, methods of testing and equipment to be used, including the latest calibration dates, shall be submitted in writing for the Project Manager's approval.

The section of pipe to be tested shall be filled with water of potable quality, and all air shall be expelled from the pipe. Taps as necessary shall be made for releasing all of the air and for all test purposes as required. Taps may be installed during the laying of the water main pipe.

For the pressure test, the water pressure shall be raised (based on the elevation at the lowest point of the section under test and corrected to the gauge location) to a minimum pressure of 150 pounds per square inch gauge for domestic water mains, and 250 pounds per square inch gauge for holly water mains.

The required pressure shall be maintained for an uninterrupted period of 2 hours. The volume of water required to maintain the specified pressure shall not exceed the limits determined by the following formula as defined in Section 4 of ANSI/AWWA C600:

$$L = \frac{SD\sqrt{P}}{133{,}200}$$

L is the allowable leakage in gallons per hour; S is the length of pipe tested in feet; D is the nominal diameter of the pipe in inches; and P is the average test pressure during the leakage test in pounds per square inch gauge.

If a section of water main should fail to pass the pressure test, the defective material or work shall be uncovered, located, and repaired. Repeated tests and repairs shall be made until the section passes the required tests.

R901-3.05 Disinfection

After a section of the water main has been pressure tested and found acceptable, it shall be thoroughly flushed. The method of flushing shall be as approved by the Project Manager. Minimum flushing velocity shall be 2.5 feet per second.

Flows to produce A Minimum Velocity Of 2.5 Feet Per Second:

Pipe Size (Inches)	Flow (gallons Per Minute)	Hydrant Openings At 40 Pounds Per Square Inch Residual Pressure
4	100	one - 2-1/2"
6	200	one - 2-1/2"
8	400	one - 2-1/2"
10	600	one - 2-1/2"
12	900	two - 2-1/2"
16	1600	two - 2-1/2"
18	1980	two - 2-1/2"
24	3530	one - 4-1/2"

See Table 3, AWWA C651 for number and size of blow off taps, if required.

Upon completion of flushing operations, the water main shall be disinfected with a chlorine solution using the continuous feed method. The slug method can be used only for water mains 24 inches in diameter or greater. The strength of this solution shall be such that a residual of at least 25 milligrams per liter of chlorine shall be retained in the water main after 24 hours. Disinfection shall be in accordance with the New York State Department of Health and with the requirements of ANSI/AWWA C651, except that the tablet method will not be allowed.

Following disinfection, all treated water shall be thoroughly flushed from the water main. Minimum flushing velocity shall be 2.5 feet per second.

Samples of the water shall be collected from the water main and each hydrant branch, by the Monroe County Department of Health. Hydrants are not to be used as sources for obtaining the water samples. The water main shall not be placed in service until the water has been approved for service and a copy of the approval from the Monroe County Department of Health has been received by the Project Manager and the Agency having jurisdiction over the water system. If tests are unsatisfactory, the water main shall be rechlorinated and flushed until new water samples indicate that the water is acceptable.

The Project Manager and/or the Monroe County Health Department may refuse to collect bacteriological samples if the location of the taps are determined to be improper.

R901-4 METHOD OF MEASUREMENT

R901-4.01 Ductile Iron Pipe Water Main

The quantity to be measured for payment shall be the number of linear feet of ductile iron pipe installed, as measured along the centerline of the pipe, beginning with the face of the hub forming the commencement of the new work and extending to the face of the hub or spigot constituting the end of this particular line of pipe. Branch lines will be as measured from the centerline of the pipe which the branch joins, along the centerline of the branch, to the face of the hub or spigot constituting the end of that line.

R901-4.02 Additional Ductile Iron Pipe Fittings

The quantity to be measured for payment shall be the number of pounds of additional ductile iron pipe fittings installed that were not shown on the plans and are approved by the Project Manager. Weight of fittings shall be determined from listed weight in the manufacturer's catalogue information.

R901-5 BASIS OF PAYMENT

R901-5.01 Ductile Iron Pipe Water Main

The unit price bid shall include the cost of: furnishing and installing all pipe: pipe fittings; anchor pipe; pipe specials; electrical conductivity wedges; hardware; warning tape; select backfill; concrete thrust blocks; joint materials; making pipe joints; restrained joints; furnishing, installing and removing disinfection/sampling, taps; testing the completed water main for pressure and leakage including any necessary blow off taps, chlorinating and flushing the water main as necessary; additional excavation and backfill required for purpose of testing and disinfecting water main; pavement saw cutting; preparation and distribution of service interruption notices; preparation and submittal of service information and cards; and furnishing all labor, material and equipment necessary to complete the work.

Unless provided for under separate payment items in the Proposal, the cost of furnishing, installing, maintaining, and removing temporary pipes, valves, plugs, taps, corporation stops, curb stops and boxes, blow-off pipes, and other fittings necessary for the construction of the new main, or for providing continuous service, shall be included in the unit price bid for Ductile Iron Pipe Water Main.

Excavation including rock excavation, furnishing and placing of bedding and select granular backfill, surface restoration, and connections to existing water mains will be paid for under separate items. The cost of temporary sheeting and trench protection shall be included in the price bid for excavation.

All hand or tunnel excavation in and around water lines, gas lines, sewers, steam lines, electric conduit, telegraph conduit, telephone conduit, tree roots, pipe joints and curbs shall be included in the unit price bid for excavation.

Where, in the opinion of the Project Manager, more concrete for thrust blocks is required than is indicated on the detail drawings, additional payment shall be made for the extra concrete. Additional payment shall be made based on the unit price bid for concrete in the Proposal, or the unit price indicated in the Contingent Item sheet if a unit bid for concrete is not in the Proposal. No payment will be made for additional concrete used due to the unnecessary excavation of trenches beyond required pay limits.

A partial payment of only 50 percent of the unit price bid will be made for installed water main that has not been tested, or has not satisfactorily passed both pressure and health tests.

R901-5.02 Ductile Iron Pipe Water Main with Polyethylene Encasement

The unit price shall also include the cost of furnishing and installing polyethylene tube encasement and polyethylene adhesive tape.

R901-5.02 Additional Ductile Iron Pipe Fittings

The unit price bid shall include the cost of: furnishing and installing all additional pipe fittings; pipe specials; concrete thrust blocks; joint materials; making pipe joints; testing with the completed water main for pressure and leakage; disincection; and furnishing all labor, material and equipment necessary to complete the work.

Excavation , rock excavation, furnishing and placing of bedding and select granular backfill, will be paid for under separate items. The laying length of these fittings will not be deducted from the linear foot measurement for ductile iron pipe water main.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R901.01XX	X" Ductile Iron Pipe Water Main Class 52	Linear Foot
R901.02XX	X" Ductile Iron Pipe Water Main Class 52 (Anchor Pipe)	Linear Foot
R901.03XX	X" Ductile Iron Pipe Water Main Class 56	Linear Foot
R901.04XX	X" Ductile Iron Pipe Water Main Class 52 (Including Polyethylene Encasement)	Linear Foot
R901.05XX	X" Ductile Iron Pipe Water Main Class 52 (Anchor Pipe, Including Encasement Polyethylene)	Linear Foot
R901.06XX	X" Ductile Iron Pipe Water Main Class 56 (Including Polyethylene Encasement)	Linear Foot
R901.07	Additional Ductile Iron Pipe Fittings	Pound

SECTION R902 - GATE VALVE WITH VALVE BOX

R902-1 DESCRIPTION

The work shall consist of the installation of new gate valves with valve box and salvaging of existing valves as shown on the plans and as directed by the Project Manager.

R902-2 MATERIALS

R902-2.01 General

Gate valves furnished shall be Metropolitan Pattern double-disk gate valve with non-rising stems, "O" ring seals, standard 2 inch square AWWA operating nut and shall open right (clockwise). Gate valves shall remain watertight under a test pressure of 300 P.S.I.. All valves shall meet or exceed all requirements of ANSI/AWWA C500 requirements for mechanical joint valves. Unless otherwise specified, all valves 16 inches and larger shall be horizontal type, and shall be equipped with bypass pipe and valve.

R902-2.02 Vertical Gate Valves

Vertical gate valves 16 inches and larger shall have spur gears, an enclosed gear case for buried installations, and a conventional stuffing box.

R902-2.03 Horizontal Gate Valves

Horizontal gate valves shall have a beveled gear operator with a stem cover plate for underground installation. Gate valves shall be equipped with bronze tracks, rollers and scrappers.

R902-2.04 Bypass Valves

Bypass valves shall meet all the general requirements for valves except they shall have standard flanged ends.

Bypass pipe and valves shall be sized as follows:

Valve Size (Inches)	Bypass Pipe and Valve Size (Inches)
16 to 20	3
24 to 30	4
36	6

R902-2.05 Valve Boxes

Valve boxes shall conform to the material requirements of Section R909.

R902-2.06 Hardware

All hardware shall be made of cold formed, high strength, low-alloy steel (Cor-ten), ASTM A242.

R902-2.07 Bedding, Backfill, and Surface Restoration

Bedding, backfill, and surface restoration materials, and methods of placement shall conform to the requirements of Section R901.

R902-3 CONSTRUCTION DETAILS

R902-3.01 General

Appropriate measures shall be taken to prevent dirt, debris, and surface water from entering the water main. Open pipe ends shall be plugged with watertight plugs whenever work is discontinued for any length of time, or when

laying conditions may allow foreign matter to enter the pipe. The interior of the valve, open pipe ends, all new pipe, and sleeves used in making the installation, shall be swabbed with a 5 percent hypochlorite solution before installation.

R902-3.02 Installation

Gate valves shall be installed in the water main in accordance with ANSI/AWWA C500. Valve boxes shall be provided with both main valves and bypass valves.

The gate valve shall be inspected, cleaned, lubricated, and tested before installation to insure that it is in proper working order.

The gate valve shall be installed with its stem in a vertical position. Special attention shall be paid to the backfill under the gate valve to obtain a well compacted bed for the gate valve. All joints shall be made watertight.

R902-3.03 Valve Boxes

The valve box shall be carefully set over the valve stem. The top section shall be adjustable for elevation, and the base shall be centered over the operating nut. All valve boxes shall be carefully set and braced to insure that they remain in a vertical position centered on the valve stem during and after backfilling. Proper alignment and height of all new boxes shall be maintained, until completion of the project. The top of the valve box shall be flush with the finished surface grade. Backfilling of the trench shall be done in a manner so as to avoid damage to the valve and valve box.

R902-3.04 Salvage Existing X" Valve

On existing water mains to be abandoned, all valves 16 inch and larger shall be removed and delivered to the Water Bureau, Materials and Equipment Building No. 3, 401 Dewey Avenue, Rochester, New York.

The existing valve and valve box shall be removed. The open ends of the abandoned water main pipe shall be plugged with concrete. Concrete plugs shall completely fill the water main pipe for a length of 12 inches. After the concrete has set, the excavation shall be backfilled and the disturbed surface area restored.

R902-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of gate valves with valve box installed.

R902-5 BASIS OF PAYMENT

R902-5.01 Gate Valve with Valve Box

The unit price bid shall include the cost of: furnishing and installing gate valve with valve box; including bypass valve with valve box, bypass pipe; maintaining proper alignment and height of the valve boxes; pavement saw cutting; and furnishing all labor, material and equipment necessary to complete the work.

Excavation rock excavation, furnishing and placing of bedding and select granular backfill, and surface restoration will be paid for under separate bid items.

R902-5.02 Salvage Existing X" Valve

The unit price bid shall include the cost of: removal and delivery of existing valve and valve box; furnishing and installing concrete plugs; excavation, backfill, and surface restoration; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R902.01XX	X" Gate Valve w/ Valve Box - Vertical Type	Each
R902.02XX	X" Gate Valve w/ Valve Box - Horizontal Type	Each
R902.03XX	Salvage Existing X" Valve	Each

SECTION R904 - TAPPING SLEEVE, TAPPING SADDLE WITH TAPPING VALVE AND VALVE BOX

R904-1 DESCRIPTION

The work shall consist of the installation of tapping sleeves, tapping saddles, with valves and valve box as shown on the plans and as directed by the Project Manager.

R904-2 MATERIALS

R904-2.01 Tapping Sleeves

Tapping sleeves shall be used for water mains 12 inches in diameter and smaller. Tapping sleeves shall be cast iron or ductile iron split tapping sleeve with an asphalt coating conforming to the requirements of ANSI/AWWA C110. Tapping sleeves shall have rubber gaskets and shall be designed for a working pressure of 150 pounds per square inch for domestic water mains and 250 pounds per square inch for holly water mains. The ends shall be mechanical joints.

R904-2.02 Tapping Saddles

For water mains 16 inches in diameter and larger, ductile iron tapping saddles with corrosion resistant alloy steel straps shall be used. The tapping saddle shall have an asphalt coating conforming to the requirements of ANSI/AWWA C110. Fittings shall be designed for a working pressure of 150 pounds per square inch for domestic water mains and 250 pounds per square inch for holly water mains.

R904-2.03 Tapping Valves

Tapping valves shall conform to the material requirements of Section R902.

R904-2.04 Valve Boxes

Valve boxes shall conform to the material requirements of Section R909.

R904-2.05 Hardware

All hardware shall be made of cold formed, high strength, low-alloy steel (Cor-ten), ASTM A242.

R904-2.06 Thrust Restraint

Concrete thrust blocks and restrained joints shall conform to the requirements of Section R901.

R904-2.07 Bedding, Backfill, and Surface Restoration

Bedding, backfill, and surface restoration materials, and methods of placement shall conform to the requirements of Section R901.

R904-3 CONSTRUCTION DETAILS

R904-3.01 General

All work shall be coordinated with the Water Bureau. The Water Bureau will close all valves needed to isolate the section of the water main to receive the valve. The Water Bureau shall be notified a minimum of 10 working days in advance of intent to do the work requiring the operation of valves and appurtenances; and a minimum of 2 working days advance notice when operation of valves and appurtenances is required for the actual work. All valves and appurtenances are to be operated only by authorized representatives of the Water Bureau.

R904-3.02 Installation

Pavement saw cutting shall be required prior to all work, except in areas of reconstruction. All street cuts shall be made by a pavement saw and shall conform to the requirements of Section R622.

Excavation shall be only to a sufficient length, width and depth needed to expose a section of the existing water main, and to install the tapping sleeve/saddle. Excavation shall conform to the requirements of Section R206.

It shall be the Contractor's responsibility to obtain the outside diameter of the existing water main to be tapped for proper sizing of the tapping sleeve/saddle. Excavation is normally required to obtain the actual outside diameter measurement of the pipe.

Prior to installation, the tapping valve shall be inspected, cleaned, lubricated and tested to insure it is in proper working order.

The portion of the water main to receive the sleeve/saddle shall be cleaned prior to the installation of the sleeve/saddle. All loose dirt, scale and rust shall be removed to a minimum distance of 12 inches beyond the ends of the sleeve/saddle.

The interior of the valve and sleeve/saddle shall be swabbed with 5 percent hypochlorite solution before installation.

The sleeve/saddle and tapping valve shall be installed according to the manufacturer's latest instructions and as approved by the Project Manager. Prior to making the tap, the installation shall be pressure tested with compressed air at the designed pressure rating in the presence of the Project Manager, for any leakage. The installation shall be watertight, both prior to and after making the tap.

All sleeves/saddles shall be solidly braced to prevent any deflection due to thrust pressure. Bracing shall be accomplished by the use of cast-in-place concrete poured between the sleeve/saddle and undisturbed soil. Thrust block dimensions shall be as shown on the detail drawings for tees.

The valve shall be installed with its stem in a vertical position. Special attention shall be paid to bedding under the valve in order to obtain a well compacted bed for the valve and to prevent rotation of the sleeve/saddle. The valve box shall be installed according to the requirements of Section R909.

The valve box shall be carefully set over the valve stem. The top section shall be adjustable for elevation, and the base shall be centered over the operating nut. All valve boxes shall be carefully set and braced to insure that they remain in a vertical position centered on the valve stem during and after backfilling. Proper alignment and height of all new boxes shall be maintained, until completion of the project. The top of the valve box shall be flush with the finished surface grade.

Backfilling of the trench shall be done in a manner so as to avoid damage to the valve and valve box.

Upon completion of the work, the excavation shall be backfilled and the surface area restored.

R904-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of tapping sleeves, tapping saddles with tapping valves with valve boxes installed.

R904-5 BASIS OF PAYMENT

The unit price bid shall include the cost of: furnishing and installing the tapping sleeve/tapping saddle with tapping valve and valve box; making the required tap; concrete thrust block; maintaining proper alignment and height of the valve box; pavement saw cutting; pressure testing; connecting new water main to existing water main; additional excavation and backfill necessary to obtain the outside diameter of water main to be tapped; and furnishing all labor, material and equipment necessary to complete the work.

Excavation, rock excavation, furnishing and placing of bedding and select granular backfill, and surface restoration will be paid for under separate bid items.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R904.01XX	X" x X" Tapping Sleeve and Valve w/ Valve Box	Each
R904.02XX	X" x X" Tapping Saddle and Valve w/ Valve Box	Each

SECTION R905 - CUTTING-IN VALVE WITH VALVE BOX AND SLEEVE

R905-1 DESCRIPTION

The work shall consist of the installation of cutting-in valves with valve box and sleeve(s) in existing water mains as shown on the plans and as directed by the Project Manager.

R905-2 MATERIALS

R905-2.01 Valves

Cutting-in valves shall conform to the material requirements of Section R902, except that a Metropolitan Pattern will not be required for valves 12 inches in diameter and smaller.

R905-2.02 Valve Boxes

Valve boxes shall conform to the material requirements of Section R909.

R905-2.03 Cutting-In Sleeves

For valves 12 inches in diameter and smaller, a cutting-in sleeve shall be required. The cutting-in sleeve shall be made of ductile iron conforming to all applicable sections of AWWA C110, or approved equivalent. One end shall be standard size plain end for mechanical joint pipe and the other end shall be mechanical joint. The sleeve shall be of a type that will lock in place. Valves and sleeves shall include all hardware, glands and gaskets. The manufacturer and model of the sleeves shall be approved by the Project Manager prior to installation.

R905-2.04 Solid Sleeves

For valve sizes 16 inches in diameter and larger- two mechanical joint ductile iron solid sleeves, long pattern, shall be required. Solid sleeves shall be of dual purpose type for use in plain ends of either centrifugal or pit cast iron pressure pipe, and shall conform to the latest requirements of ANSI/AWWA C110.

R905-2.05 Pipe

Pipe used in conjunction with solid sleeves shall be ductile iron pipe conforming to the requirements of Section R901.

R905-2.06 Hardware

All hardware shall be made of cold formed, high strength, low-alloy steel (Cor-ten), ASTM A242.

R905-2.07 Bedding, Backfill, and Surface Restoration

Bedding, backfill, and surface restoration materials, and method of placement shall conform to the requirements of Section R901.

R905-3 CONSTRUCTION DETAILS

R905-3.01 General

All work shall be coordinated with the Water Bureau. The Water Bureau will close all valves needed to isolate the section of the water main to receive the valve. The Water Bureau shall be notified a minimum of 10 working days in advance of intent to do the work requiring the operation of valves and appurtenances; and a minimum of 2 working days advance notice when operation of valves and appurtenances is required for the actual work. All valves and appurtenances are to be operated only by authorized representatives of the Water Bureau.

Appropriate measures shall be taken to prevent dirt, debris, and surface water from entering the water main. Open pipe ends shall be plugged with watertight plugs whenever work is discontinued for any length of time, or when laying conditions may allow foreign matter to enter the pipe. The interior of the valve and open pipe ends, all new

pipe, and sleeves used in making the installation, shall be swabbed with a 5 percent hypochlorite solution before installation.

R905-3.02 Installation

Pavement saw cutting shall be required prior to all work, except in areas of reconstruction. All street cuts shall be made by a pavement saw and shall conform to the requirements of Section R622.

Excavation shall be only to a sufficient length, width and depth needed to expose, cut and remove a section of the existing water main, and to install the cutting-in valve. Excavation shall conform to the requirements of Section R206.

The existing water main shall be measured and cut to the proper length for the new installation. The cut section of pipe shall be removed and disposed of. The cutting-in valve and sleeve shall be installed according to the manufacturer's latest instructions and as approved by the Project Manager.

Before installation, the valves shall be inspected, cleaned, lubricated, and tested to insure that they are in proper working order.

The valve shall be installed with its stem in a vertical position. Special attention shall be paid to the backfill under the valve to obtain a well compacted bed for the valve. All joints shall be made watertight. Prior to backfilling, the water main shall be energized and the installation shall be pressure tested under line pressure, in the presence of the Project Manager.

The valve box shall be carefully set over the valve stem. The top section shall be adjustable for elevation, and the base shall be centered over the operating nut. All valve boxes shall be carefully set and braced to insure that they remain in a vertical position centered on the valve stem during and after backfilling. Proper alignment and height of all new boxes shall be maintained, until completion of the project. The top of the valve box shall be flush with the finished surface grade. Backfilling of the trench shall be done in a manner so as to avoid damage to the valve and valve box.

R905-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of cutting-in valves with valve box and sleeve installed.

R905-5 BASIS OF PAYMENT

The unit price bid shall include the cost of: measuring, cutting, and removing a section of the existing water main; cleaning the existing pipe; furnishing and using all temporary plugs and disinfectant to prevent contamination of the water main; furnishing and installing the cutting-in valve with valve box and sleeve(s); maintaining proper alignment and height of the valve box; pavement saw cutting; connecting new water main to existing water main; and furnishing all labor, materials and equipment necessary to complete the work.

Excavation, rock excavation, furnishing and placing of bedding and select granular backfill, and surface restoration will be paid for under separate bid items.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R905.01XX	X" Cutting-in Valve w/ Valve Box and Sleeve(s)	Each

SECTION R906 - INSERTION SLEEVE

R906-1 DESCRIPTION

The work shall consist of the installation of insertion sleeves as shown on the plans and as directed by the Project Manager.

R906-2 MATERIALS

R906-2.01 General

Insertion sleeve shall consist of two solid sleeves and replacement pipe, as required, for each installation.

All pipe, fittings, joints, and hardware shall conform to the requirements of Section R901.

R906-2.02 Sleeves

Sleeves shall be mechanical joint ductile iron solid sleeves, long pattern. Sleeves shall be of the dual purpose type for use in plain ends of either centrifugal or pit cast iron pressure pipe and shall conform to the latest requirements of ANSI/AWWA C110.

R906-2.03 Replacement Pipe

Pipe used to replace existing pipe shall be ductile iron pipe of the same size as the existing pipe, and shall conform to the requirements of Section R901.

R906-2.04 Bedding, Backfill, and Surface Restoration

Bedding, backfill, and surface restoration materials and methods of placement shall conform to the requirements of Section R901.

R906-3 CONSTRUCTION DETAILS

R906-3.01 General

All work shall be coordinated with the Water Bureau. The Water Bureau will close all valves needed to isolate the section of the water main to receive the insertion sleeve. The Water Bureau shall be notified a minimum of 10 working days in advance of intent to do the work requiring the operation of valves and appurtenances; and a minimum of 2 working days advance notice when operation of valves and appurtenances is required for the actual work. All valves and appurtenances are to be operated only by authorized representatives of the Water Bureau.

Appropriate measures shall be taken to prevent dirt, debris, and surface water from entering the water main. Open pipe ends shall be plugged with watertight plugs whenever work is discontinued for any length of time, or when laying conditions may allow foreign matter to enter the pipe. The interior of the open pipe ends, all new pipe, and sleeves used in making the installation, shall be swabbed with a 5 percent hypochlorite solution before installation.

R906-3.02 Installation

Pavement saw cutting shall be required prior to all work, except in areas of reconstruction. All street cuts shall be made by a pavement saw and shall conform to the requirements of Section R622.

Excavation shall be only to a sufficient length, width and depth needed to expose, cut and remove a section of the existing water main, and to install the insertion sleeve. Excavation shall conform to the requirements of Section R206.

The existing water main shall be cut, and the tee or section of pipe removed. The new pipe shall be measured and cut to make a tight fit in the existing water main. Pipe cutting equipment and methods shall be as approved by the Project Manager, prior to cutting the pipe. All cuts shall be straight, smooth, and perpendicular to the centerline of the pipe.

The cut end of the abandoned water main pipe shall be plugged with concrete. Concrete plugs shall completely fill the water main pipe for a length of 12 inches. Valves in the abandoned water main shall be permanently closed.

Prior to installation of the sleeves, the open ends of the existing water main shall be cleaned. All loose dirt, scale and rust shall be removed to a minimum distance of 12 inches from the cut ends of the existing pipe. Sleeves shall be centered over the connection, and installed according to the manufacturer's latest instructions and as approved by the Project Manager. Pipe shall be installed according to the requirements of Section R901. The fit between the existing water main and the new pipe nipple shall not exceed a gap of 1/8 inch. All joints shall be made watertight. Prior to backfilling, the water main shall be energized and the installation shall be pressure tested under line pressure in the presence of the Project Manager.

R906-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of insertion sleeve units installed. An insertion unit shall consist of two sleeves and up to a maximum of 5 feet of pipe, as measured between the sleeves. Any pipe installed in excess of 5 feet shall be paid for under Section R901.

R906-5 BASIS OF PAYMENT

The unit price bid shall include the cost of: furnishing and installing the required sleeves, including pipe; measuring and cutting of existing and new pipe; removal and disposal of existing cut pipe and fittings; cleaning the existing pipe; furnishing and using all temporary plugs and disinfectant to prevent contamination of the water main; pavement saw cutting; connecting new water main to existing water main; plugging the abandoned water main pipe with concrete; pressure testing; and furnishing all labor, material and equipment necessary to complete the work.

Excavation, rock excavation, furnishing and placing of bedding and select granular backfill, and surface restoration will be paid for under separate bid items.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R906.01XX	X" Insertion Sleeve	Each

SECTION R907 - CONNECT NEW WATER MAIN TO EXISTING WATER MAIN

R907-1 DESCRIPTION

The work shall consist of the connection of a newly constructed water main to an existing water main as shown on the plans and as directed by the Project Manager.

R907-2 MATERIALS

R907-2.01 General

The materials shall conform to the requirements of Section R901.

R907-2.02 Fittings

All fittings and joint connection materials required to make the connection shall be as approved by the Project Manager prior to installation.

R907-2.03 Thrust Restraint

Concrete thrust blocks and restrained joints shall conform to the requirements of Section R901.

R907-2.04 Bedding, Backfill, and Surface Restoration

Bedding, backfill, and surface restoration materials and method of placement shall conform to the requirements of Section R901.

R907-3 CONSTRUCTION DETAILS

R907-3.01 General

All work shall be coordinated with the Water Bureau. The Water Bureau will close all valves needed to isolate the section of the water main to be shut down. The Water Bureau shall be notified a minimum of 10 working days in advance of intent to do the work requiring the operation of valves and appurtenances; and a minimum of 2 working days advance notice when operation of valves and appurtenances is required for the actual work. All valves and appurtenances are to be operated only by authorized representatives of the Water Bureau.

Appropriate measures shall be taken to prevent dirt, debris, and surface water from entering the water main. Open pipe ends shall be plugged with watertight plugs whenever work is discontinued for any length of time, or when laying condition may allow foreign matter to enter the pipe. The interior of the open pipe ends, all new pipe, fittings and sleeves used in making the installation, shall be swabbed with a 5 percent hypochlorite solution before installation.

R907-3.02 Installation

Pavement saw cutting shall be required prior to all work, except in areas of reconstruction. All street cuts shall be made by a pavement saw and shall conform to the requirements of Section R622.

Excavation shall be only to a sufficient length, width and depth needed to expose, cut and remove a section of the existing water main, and to connect the new water main. Excavation shall conform to the requirements of Section R206.

Pipe cutting equipment and methods shall be as approved by the Project Manager, prior to cutting the pipe. All cuts shall be straight, smooth and perpendicular to the centerline of the pipe.

Prior to installation of any new pipe, the end of the existing water main shall be cleaned. All loose dirt, scale and rust shall be removed to a length sufficient to properly install the connection fitting.

The new water main shall be connected to the existing main using approved and appropriate gaskets, materials and fittings. The fit between the existing water main and the new pipe shall be tight and shall not exceed a gap of 1/8 inch. All tees, elbows, bends and plugs shall be solidly braced against the trench wall to prevent any deflection due to thrust pressure. Bracing shall be accomplished by the use of cast-in-place concrete thrust blocks or restrained joints, subject to the requirements of Section R901. All pipe joints shall be made watertight. Prior to backfilling the water main shall be energized and the connection shall be pressure tested under line pressure in the presence of the Project Manager.

The open end of the abandoned water main pipe shall be plugged with concrete. Concrete plugs shall completely fill the water main pipe for a length of 12 inches. Valves in the abandoned watermain shall be permanently closed.

R907-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of connections actually made.

R907-5 BASIS OF PAYMENT

The unit price bid shall include the cost of: cutting and removing a piece of the existing water main; removing the existing plug; cleaning the existing pipe; furnishing and using all temporary plugs and disinfectant to prevent contamination of the water main; connecting the new water main to the existing water main; furnishing and placing all pipe, pipe specials, gaskets, fittings, offsets, bends, tees, crosses, joints, and thrust blocks; restrained joints; plugging the abandoned water main with concrete; pavement saw cutting; pressure testing; and furnishing all labor, material and equipment necessary to complete the work.

Excavation, rock excavation, furnishing and placing of bedding and select granular backfill, and surface restoration will be paid for under separate bid items.

Payment for installation of a tee or cross into existing water main shall be considered as one connection.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R907.01	Connect New Water Main to Existing Water Main	Each

SECTION R908 - CUT AND PLUG EXISTING WATER MAIN

R908-1 DESCRIPTION

The work shall consist of cutting and plugging existing water mains as shown on the plans and as directed by the Project Manager.

R908-2 MATERIALS

R908-2.01 Plugs and Clamps

Plugs shall be ductile iron and shall conform to the requirements of ANSI/AWWA C110.

Clamps shall be socket clamps with tie rods.

Tapped plugs shall be cast iron with a 2 inch tap and pipe plug.

Tie rods shall be 3/4 inch minimum size.

Tie bars shall be 3 inch steel channels, 5.0 pounds per foot.

R908-2.02 Hardware

All hardware shall be made of cold formed, high strength, low-alloy steel (Cor-ten), ASTM A242.

R908-2.03 Thrust Restraint

Concrete thrust blocks and restrained joints shall conform to the requirements of Section R901.

R908-2.04 Bedding, Backfill, and Surface Restoration

Bedding, backfill, and surface restoration materials and methods of placement shall conform to the requirements of Section R901.

R908-3 CONSTRUCTION DETAILS

R908-3.01 General

All work shall be coordinated with the Water Bureau. The Water Bureau will close all valves to isolate the section of water main to be shut down. The Water Bureau shall be notified a minimum of 10 working days in advance of intent to do the work requiring the operation of valves and appurtenances; and a minimum of 2 working days advance notice when operation of valves and appurtenances is required for the actual work. All valves and appurtenances are to be operated only by authorized representatives of the Water Bureau.

Whenever possible, the plug shall be installed at a tee, cross or similar connection fitting. Where the water main is to be plugged at a pipe joint, the plug shall be installed in the bell end of the pipe.

Appropriate measures shall be taken to prevent dirt, debris, and surface water from entering the water main. Open pipe ends shall be plugged with watertight plugs whenever work is discontinued for any length of time, or when laying conditions may allow foreign matter to enter the pipe. The interior of the open pipe ends and the new plug used in making the installation, shall be swabbed with a 5 percent hypochlorite solution before installation.

R908-3.02 Installation

Pavement saw cutting shall be required prior to all work, except in areas of reconstruction. All street cuts shall be made by a pavement saw and shall conform to the requirements of Section R622.

Excavation shall be only to a sufficient length, width and depth needed to expose, cut and plug the water main. Excavation shall conform to the requirements of Section R206.

A section of pipe shall be cut and removed. The pipe or fitting to be plugged shall be cleaned. On pipe fittings where plugs cannot be bolted directly to the pipe joint, the plug shall be installed and held in place by a retaining bar extending across the center of the plug. A socket clamp shall be installed on the pipe or fitting behind the bell, and the retaining bar shall be secured to the socket clamp with steel rods, socket clamp washers, lock washers and nuts. Prior to backfilling, all uncoated materials shall receive a hand application of Sikagard 62 Protective Coating as manufactured by Sika Corporation, or approved equivalent. The new installation shall be made watertight. Upon completion of the work and prior to backfilling, the water main shall be energized and the installation shall be pressure tested under line pressure in the presence of the Project Manager.

In conjunction with mechanical restraints, cast-in-place concrete thrust blocks shall be provided to transmit the thrust due to water pressure to undisturbed earth. Prior to placing the concrete, all wet and undesireable material shall be removed from the excavation. Timber blocking will not be allowed.

The cut end of the abandoned water main pipe shall be plugged with concrete. Concrete plugs shall completely fill the water main pipe for a length of 12 inches. Valves in the abandoned watermain shall be permanently closed.

The use of caps in lieu of plugs shall require approval by the Project Manager.

After the concrete has set, the excavation shall be backfilled and the surface area restored.

R908-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of plugs installed.

R908-5 BASIS OF PAYMENT

The unit price bid shall include the cost of: cutting and removing a section of the existing water main; cleaning the existing pipe; furnishing and using all temporary plugs and disinfectant to prevent contamination of the water main; furnishing and placing the plug, mechanical restraints and appurtenances; constructing the concrete thrust block; plugging the abandoned water main with concrete; pavement saw cutting; pressure testing; and furnishing all labor, material and equipment necessary to complete the work.

Excavation including rock excavation, furnishing and placing of bedding and select granular backfill, and surface restoration will be paid for under separate bid items.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R908.01XX	Cut and Plug Existing X" Water Main	Each

SECTION R909 - VALVE BOX

R909-1 DESCRIPTION

The work shall consist of the installation of new valve box assembly, remove or adjust existing valve boxes, or installation of new valve box top section and lid as shown on the plans and as directed by the Project Manager.

R909-2 MATERIALS

R909-2.01 Valve Boxes

Valve boxes shall be two piece Buffalo Style, 5-1/4 inch shaft, cast iron boxes with a slip type extension.

R909-2.02 Adjustment Rings

Adjustment rings shall be cast iron and be capable of fitting on Buffalo Style valve boxes. Vertical thickness shall be in 1 inch increments.

R909-2.03 Bedding, Backfill, and Surface Restoration

Bedding, backfill, and surface restoration materials and methods of placement shall conform to the requirements of Section R901.

R909-2.04 Valve Box Top Section

Replacement valve box top section and lid shall be cast iron, Buffalo Style or approved equivalent.

R909-3 CONSTRUCTION DETAILS

R909-3.01 General

All work shall be coordinated with the Water Bureau. The Water Bureau shall be notified 2 working days in advance of doing any work.

Prior to adjusting or installing valve boxes on valves to remain in service, the valve shall be operated by the Water Bureau to insure that it is functioning properly. Valves that do not function properly shall be replaced only as approved by the Project Manager. All valves are to be operated only by authorized representatives of the Water Bureau.

R909-3.02 Installation

Pavement saw cutting shall be required prior to all work, except in areas of reconstruction. All street cuts shall be made by a pavement saw and shall conform to the requirements of Section R622.

Excavation shall be only to a sufficient length, width and depth needed to expose and remove, replace, or adjust an existing valve box assembly. Excavation shall conform to the requirements of Section R206.

Existing valve boxes found damaged, not of sufficient length to be raised to the required finished grade, or determined by the Water Bureau to be in need of replacement, shall be removed and replaced with a new valve box assembly.

The valve box shall be carefully set over the valve stem. The top section shall be adjustable for elevation, and the base shall be centered over the operating nut. All valve boxes shall be carefully set and braced to insure that they remain in a vertical position centered on the valve stem during and after backfilling. Proper alignment and height of all new boxes shall be maintained, until completion of the project. The top of the valve box shall be flush with the finished surface grade. Backfilling of the trench shall be done in a manner so as to avoid damage to the valve and valve box.

Upon completion of the work, the excavation shall be backfilled and the surface area restored.

R909-3.03 Removal of Existing Valve Box Assembly

Existing valve boxes on abandoned valves shall be removed to a minimum of 18 inches below the finished grade.

R909-3.04 Installation of New Valve Box Assembly

The existing valve box shall be removed and a new valve box assembly installed. The new valve box shall be carefully set over the existing valve stem, the base centered over the operating nut and the top section adjusted for elevation.

R909-3.05 Replacement of Valve Box Top Section

A sufficient area shall be excavated to enable the upper section of the valve box to be removed. No debris shall be allowed to fall into the existing valve box. The new top section shall be carefully set over the existing bottom section and adjusted to the proper elevation.

R909-3.06 Valve Box Adjustment

A. Valve Box Adjustment with Cast Iron Rings

Prior to resurfacing of a pavement surface, the top elevation of an existing valve box shall be adjusted to finished grade by adding or removing cast iron adjustment rings. Cast iron rings required to raise valve boxes other than the Buffalo Style shall be provided by the Water Bureau. The Water Bureau shall be notified 2 working days in advance when rings are required for adjustment. The adjustment ring shall be glued into the existing valve box. The glue shall be Quickbond #612, manufactured by Permabond.

B. Valve Box Adjustment with Slip or Screw Type Extensions

The existing valve box shall be raised or lowered to the finished grade. Prior to adjustment, the valve box shall be checked for proper alignment. If a valve box is found to be out of alignment, the Project Manager shall be notified immediately. Flanges on existing valve box sections are not to be broken to facilitate adjustment.

R909-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of valve boxes actually installed, removed, or adjusted.

R909-5 BASIS OF PAYMENT

R909-5.01 General all Items

The unit price bid shall include the cost of: furnishing and installing new valve box assemblies or cast iron adjustment rings; having existing valves checked; removal of existing valve boxes; adjustment of new or existing valve boxes to finished grade and alignment; pavement saw cutting; and furnishing all labor, material and equipment necessary to complete the work.

R909-5.02 Remove Existing Valve Box

Payment for valve box removal will be made only for boxes that are removed and not replaced, and are located outside areas of pavement reconstruction or trench and culvert excavation. Valve boxes permanently removed in areas of pavement reconstruction or trench and culvert excavation, shall be paid for under Sections R203 and R206. Payment for valve boxes removed in conjunction with valve salvaging will be made under Section R902.

R909-5.03 Valve Box Adjustment with Cast Iron Rings

The unit price bid shall include the cost of furnishing and installing cast iron adjustment rings up to a thickness of 6 inches.

R909-5.04 Valve Box Adjustment with Cast Iron Rings Furnished by the Water Bureau

The unit price bid shall include the cost of installing cast iron adjustment rings up to a thickness of 6 inches. Adjustment rings shall be obtained from the Water Bureau, Materials and Equipment Building No. 3, 401 Dewey Avenue, Rochester, New York.

R909-5.05 Replacement of Valve Box Top Section

The unit price bid shall include the cost of removal of existing top sections and lids, furnishing and installing new valve box top sections and lids, adjustment of the new top sections and lids to the satisfactory elevation.

R909-5.06 Excavation, Backfill and Surface Restoration

Excavation including rock excavation, furnishing and placing of select granular backfill and surface restoration will be paid for under separate bid items or included in the price bid for the items as indicated in the payment item description.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R909.01	Furnish and Install New Valve Box	Each
R909.02	Furnish and Install New Valve Box (Including Excavation and Backfill)	Each
R909.03	Furnish and Install New Valve Box (Including Excavation, Backfill and Surface Restoration)	Each
R909.04	Remove Existing Valve Box	Each
R909.05	Remove Existing Valve Box (Including Excavation and Backfill)	Each
R909.06	Remove Existing Valve Box (Including Excavation, Backfill and Surface Restoration)	Each
R909.07	Adjust Valve Box to Grade - Extension Adjustment	Each
R909.08	Adjust Valve Box to Grade - Extension Adjustment (Including Excavation and Backfill)	Each
R909.09	Adjust Valve Box to Grade - Extension Adjustment (Including Excavation, Backfill and Surface Restoration)	Each
R909.10	Adjust Valve Box to Grade w/ Adjustment Rings	Each
R909.11	Adjust Valve Box to Grade w/ Adjustment Rings Furnished by Water Bureau	Each
R909.12	Replace Valve Box Top Section	Each
R909.13	Replace Valve Box Top Section (Including Excavation and Backfill)	Each
R909.14	Replace Valve Box Top Section (Including Excavation, Backfill and Surface Restoration)	Each

SECTION R912 - CORPORATION STOP AND CONNECTION, ABANDON EXISTING WATER SERVICE AT TAP (2 INCH AND SMALLER)

R912-1 DESCRIPTION

The work shall consist of the installation of a new corporation stop or the abandonment of an existing water service as shown on the plans and as directed by the Project Manager.

R912-2 MATERIALS

R912-2.01 Corporation Stops

Corporation stops shall be of cast brass with "0" ring seals and fitted flared couplings for copper pipe connections. Corporation stop manufacturer and model shall be approved by the Project Manager, prior to their use in the work.

The size of the corporation and coupling shall be the same size as the existing service pipe, with minimum size being 3/4 inch.

R912-2.02 Service Saddles

Service saddles shall be double strap, all brass tapping saddles, with rubber gaskets. Service saddles shall be as approved by the Water Bureau, prior to their use in the work.

R912-2.03 Bedding, Backfill and Surface Restoration

Bedding, backfill, and surface restoration materials and method of placement shall conform to the requirements of Section R901.

R912-3 CONSTRUCTION DETAILS

R912-3.01 General

The location and disposition of all water services shall be verified before beginning work.

The Water Bureau shall be notified at least 2 working days in advance of doing any work. If requested, the Water Bureau will check the operation of the service valve. All service valves are to be operated only by authorized representatives of the Water Bureau.

Prior to any disruption of service, all affected water service customers shall be notified by the Contractor at least 24 hours in advance of the disruption, and if necessary shall be provided with temporary water service according to the requirements of Sections R901 and R916.

Records of all new, renewed, and extended water services shall be provided. Such records shall identify for each service the address and coordinate location of the service, material used, the length and size of new copper service, and the location of the corporation stop and curb stop. This information shall be recorded on a standard water service card, as shown on the detail drawings. Water service cards shall be supplied by and obtained from the Water Bureau, and shall be submitted on a monthly basis to the Water Bureau Dispatcher, Water Bureau, 10 Felix Street, Rochester, New York.

R912-3.02 Installation

Pavement saw cutting shall be required prior to all water service work, except in areas of reconstruction. All street cuts shall be made by a pavement saw and shall conform to the requirements of Section R622.

The water main shall be exposed at the location where the tap is to be made, or the service to be abandoned. Excavation shall conform to the requirements of the Section R206.

Upon completion of the work, the excavation shall be backfilled and the disturbed surface area restored.

R912-3.03 Service Tap at Main

The tap shall be made in accordance with the requirements of ANSI/AWWA C600. Service taps shall be made at the 10 and 2 o'clock positions on the water main, and shall be made on the customers side of the water main. Only equipment specially designed for this purpose and is in good working condition shall be used. When drilling, care shall be taken to completely cut through the pipe wall. The installation of the corporation stop shall be made watertight. Backfilling of the trench shall be done in a manner so as to avoid damage to the new corporation stop.

Taps made on water main that is encased in polyethylene shall be installed according to the latest instructions and recommendations by the manufacturer of the polyethylene tube or water pipe, and as approved by the Project Manager.

912-3.04 Service Saddles

A service saddle shall be used in conjunction with a service tap when the tap size exceeds those in the following table:

Water Main Size (Inches)	Maximum Tap Size Allowed Without Service Saddle (Inches)
4 to 6	All taps require saddles
8 to 10	3/4
12	1-1/2
16 or larger	2

R912-3.05 Abandon Existing Water Service at Tap

The corporation stop shall be completely closed before the service line is disconnected at the corporation stop. If the service line cannot be removed without damaging the corporation stop and creating leaks, the service line shall be sawed off at the corporation stop. The nut on the bottom of the corporation stop, if present, shall be completely tightened. If the corporation stop leaks when fully closed, the corporation stop shall be plugged. Corporation stops leaking at the threaded tap shall be tightened. Existing service lines will not be required to be removed under this item. Existing curb boxes on abandoned services shall be removed. Payment for curb box removal shall be made under Section R914.

R912-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of water service taps and installations made, or the number of water services abandoned at the tap.

R912-5 BASIS OF PAYMENT

R912-5.01 General all Items

The unit price bid shall include the cost of: preparation and submittal of service record information and cards; pavement saw cutting; and furnishing all labor, material and equipment necessary to complete the work.

R912-5.02 Service Tap at Main

The unit price bid shall include the cost of: making the tap at the main; furnishing and installing the corporation stop; service saddles where required; and connection of the water service to the corporation stop.

R912-5.03 Abandon Existing Water Service at Tap

The unit price bid shall include the cost of: closing the corporation stop; disconnecting the service pipe from the corporation stop; plugging the corporation stop if necessary; and removal of the curb box if necessary.

No payment will be made for disconnecting water services on abandoned water mains, or for closing corporation stops and disconnecting water services that are to be extended to new or existing water mains, unless a separate excavation is required.

R912-5.04 Excavation, Backfill and Surface Restoration

Excavation, rock excavation, furnishing and placing of bedding and select granular backfill, surface restoration will be paid for under separate bid items or included in the price bid for each item as indicated in the item description.

Excavation that is included in the pay item shall include rock excavation.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R912.01XX	X" Service Tap at Main, Corporation Stop and Connection	Each
R912.02XX	X" Service Tap at Main, Corporation Stop and Connection (Including Excavation and Backfill)	Each
R912.03XX	X" Service Tap at Main, Corporation Stop and Connection (Including Excavation, Backfill and Surface Restoration)	Each
R912.04	Abandon Existing Water Service at Tap	Each
R912.05	Abandon Existing Water Service at Tap (Including Excavation and Backfill)	Each
R912.06	Abandon Existing Water Service at Tap (Including Excavation, Backfill and Surface Restoration)	Each

SECTION R913 - COPPER WATER SERVICE (2 INCH AND SMALLER)

R913-1 DESCRIPTION

The work shall consist of the installation of new copper water service or extension of an existing water service as shown on the plans and as directed by the Project Manager.

R913-2 MATERIALS

R913-2.01 Pipe and Fittings

Pipe shall be copper tubing conforming to the requirements of ASTM B88, Type K. The size of the new tubing shall be the same as the existing service, with minimum size being 3/4 inch.

Joints shall be of the flared type.

Couplings for connecting new copper tubing to new and existing corporation stops shall be flared type.

R913-2.02 Bedding, Backfill, and Surface Restoration

Bedding, backfill and surface restoration materials and method of placement shall conform to the requirements of Section R901.

R913-3 CONSTRUCTION DETAILS

R913-3.01 General

The location and disposition of all water services shall be verified before beginning work.

The Water Bureau shall be notified at least 2 working days in advance of doing any work. If requested, the Water Bureau will check the operation of the curb stops. All curb stops are to be operated only by authorized representatives of the Water Bureau.

Prior to any disruption of service, all affected water service customers shall be notified by the Contractor at least 24 hours in advance of the disruption, and if necessary shall be provided with temporary water service according to the requirements of Sections R901 and R916.

Records of all new, renewed, and extended water services shall be provided. Such records shall identify for each service the address and coordinate location of the service, material used, the length and size of new copper service, and the location of the corporation stop and curb stop. This information shall be recorded on a standard water service card, as shown on the detail drawings. Water service cards shall be supplied by and obtained from the Water Bureau, and shall be submitted on a monthly basis to the Water Bureau Dispatcher, Water Bureau, 10 Felix Street, Rochester, New York.

A temporary pavement shall be placed on all water service trenches, located within existing paved areas, immediately after backfilling the trench. Temporary Pavement, Item No. R412.01 shall be as directed by the Project Manager.

R913-3.02 Installation

Pavement saw cutting shall be required prior to all water service work, except in areas of reconstruction. All street cuts shall be made by a pavement saw and shall conform to the requirements of Section R622.

Excavation shall be to a depth that will provide a minimum of 4 feet 6 inches of cover over the service pipe, and a 6 inch layer of compacted sand underneath. Excavation shall conform to the requirements of Section R206.

All copper tubing for new services or extensions shall be laid in the trench in a single piece without joints between corporation stops and curb stops, or between curb stops on extensions. The tubing may be curved around obstructions in the pipe trench. The service line shall be laid at a right angle to the water main and straight from the tap to the curb stop. The tubing shall be connected to corporation stops, curb stops and to existing service pipe and stops by using approved and appropriate gaskets, joint and connection materials, or fittings required to make the connection. The new service line shall be extended to include removal of the existing curb stop and box.

For connections of copper tubing to new or existing corporation stops, a horizontal expansion curve (gooseneck) shall be formed into the tubing. The curve shall start at the outlet end of the corporation stop and extend 3 feet along the tubing with a horizontal dimension of 6 to 12 inches.

There shall be no kinks or crimps in the installed copper tubing.

Upon completion of the work and testing the service, the excavation shall be backfilled and the disturbed surface area restored.

R913-3.03 Drilled Water Services

In cases where it is desired to drill for the installation or replacement of a water service, approval shall be obtained from the Director of Water before commencing work. Open cut and excavate at the water main and the curb stop. The service shall be "drilled in" in such a manner which will insure that all of the water service is at least 4 feet 6 inches below the ground surface. "Washing in" of water services will not be allowed.

R913-3.04 Installation at Existing Appurtenances

At existing corporation stops, the service shall be shut down at the corporation stop and the existing service pipe removed. The new copper service shall be connected to the existing corporation stop only if the corporation stop is 5/8 inch diameter or larger and found not to be leaking or damaged. At existing curb stops, the curb stop shall be checked for proper operation and the water service shall be shut down. Disconnect the existing service pipe to be replaced and connect the new service pipe to the existing curb stop. Return the corporation stop to full open position.

Where an active water service is in conflict with the location of the proposed curb, the water service shall be extended so that the location of the new curb stop and box is behind the propsed curb

To extend existing services, the existing curb box and rod shall be removed and new copper tubing shall connect the existing curb stop to the new curb stop, leaving the existing curb stop in the full open position.

For replacement of an existing water service, the installation of the new service shall be extended to include removal of the existing curb stop and box.

For service renewal, any existing corporation stop determined unsatisfactory by the Project Manager shall be closed and abandoned. If an existing corporation stop is found to be broken or leaking, it shall be plugged and replaced with a new corporation stop. The cost of abandoning or plugging a defective corporation stop on a service renewal shall be included in the unit price bid for a new tap and corporation stop under Section R912. Corporation stops leaking at the threaded tap shall be tightened. A leaking tap that cannot be tightened so as to be watertight, shall be replaced by a new tapping saddle and corporation stop.

R913-3.05 Testing Water Services

Prior to backfilling the trench, all new water service work which includes all connections, joints, and unions shall be pressure tested under active line pressure in the presence of the Project Manager. All water service pipe and appurtenances shall be made watertight.

R913-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of linear feet of new copper tubing installed, as measured along the service line from the tap on the main to the curb stop, from the old curb stop to the new curb stop, and to the limit of installation.

R913-5 BASIS OF PAYMENT

R913-5.01 General all Items

The unit price bid shall include the cost of: furnishing and installing all copper tubing; pipe specials; flared connections; gasket fittings; joint and connection materials; connecting the service to new corporation stops and curb stops; connection to existing service; removal of the existing curb stop and box where required; verifying location and disposition of services; preparation and submittal of service record information and cards; pavement saw cutting; drilling operations; pressure testing; placement of select backfill excavated from the trench; and furnishing all labor, material and equipment necessary to complete the work.

R913-5.02 Connection to Existing Appurtenances

The unit price bid shall also include the cost of shutting down the existing water service and connection to existing corporation stops, curb stops, or water service lines.

R913-5.03 Extension of Existing Water Service

The unit price shall also include the cost of shutting down the existing water service, removing the existing curb box and rod, joint connection materials, and connections to the existing service.

R913-5.04 Excavation, Backfill, and Surface Restoration

Excavation, rock excavation, furnishing and placing of bedding and select granular backfill, temporary pavement and surface restoration will be paid for under separate bid items or included in the price bid for the item as indicated in the item description.

Excavation that is included in the pay item shall include rock excavation.

Surface restoration that is included in the pay item shall include temporary pavement.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R913.01XX	New X" Copper Water Service	Linear Foot
R913.02XX	New X" Copper Water Service (Including Excavation and Backfill)	Linear Foot
R913.03XX	New X" Copper Water Service (Including Excavation, Backfill and Surface Restoration)	Linear Foot
R913.04XX	New X" Copper Water Service at Existing Appurtenances	Linear Foot
R913.05XX	New X" Copper Water Service at Existing Appurtenances (Including Excavation and Backfill)	Linear Foot
R913.06XX	New X" Copper Water Service at Existing Appurtenances (Including Excavation, Backfill and Surface Restoration)	Linear Foot
R913.07XX	Extend Existing Service with New X" Copper Water Service	Linear Foot

ITEM NO.	ITEM	PAY UNIT
R913.08XX	Extend Existing Service with New X" Copper Water Service (Including Excavation and Backfill)	Linear Foot
R913.09XX	Extend Existing Service with New X" Copper Water Service (Including Excavation, Backfill and Surface Restoration)	Linear Foot

SECTION R914 - CURB STOP AND BOX

R914-1 DESCRIPTION

The work shall consist of the installation of new curb stops and curb boxes, adjusting existing curb boxes, removal of existing curb boxes, removal of existing water meter boxes, or adjusting existing water meter boxes as shown on the plans and as directed by the Project Manager.

R914-2 MATERIALS

R914-2.01 General

Curb stop and box manufacturers and models shall be as approved by the Project Manager, prior to installation.

R914-2.02 Curb Stops

Curb stops shall have cast brass bodies with "O" ring seals fitted with flared couplings for copper pipe connections.

The size of the curb stop shall be the same size as the existing service pipe, with minimum size being 3/4 inch.

R914-2.03 Curb Boxes

Curb boxes shall be two piece boxes with a slip type extension, a cast iron arch pattern lower section, a cast iron lid, and a stationary shut off rod. Curb boxes shall have a 1-1/4 inch minimum inside diameter upper section, be capable of extension to 5 feet 6 inches, and be coated with an asphalt base paint. Shut off rods shall be 4 feet long and be provided with a "S" type bend capable of centering the rod in the upper curb box section. Services larger than 1 inch shall require a curb box arch base in addition to the standard curb box unit.

R914-2.04 Bedding, Backfill, and Surface Restoration

Bedding, backfill and surface restoration materials and methods of placement shall conform to the requirements of Section R901.

R914-3 CONSTRUCTION DETAILS

R914-3.01 General

The location and disposition of all water services shall be verified before beginning work.

The Water Bureau shall be notified at least 2 working days in advance of doing any work. All service valves are to be operated only by authorized representatives of the Water Bureau and all work shall be coordinated with the Water Bureau.

Prior to any disruption of service, all affected water service customers shall be notified by the Contractor at least 24 hours in advance of the disruption, and if necessary shall be provided with temporary water service according to the requirements of Sections R901 and R916.

Records of all new service work shall be provided. Such records shall identify for each service the address and coordinate location of the service and the material used. This information shall be recorded on a water service card, as shown on the detail drawings. Water service cards shall be supplied by and obtained from the Water Bureau, and shall be submitted on a monthly basis to the Water Bureau Dispatcher, Water Bureau, 10 Felix Street, Rochester, New York.

R914-3.02 Installation

Pavement saw cutting shall be required prior to all water service work, except in areas of reconstruction. All street cuts shall be made by a pavement saw and shall conform to the requirements of Section R622.

Excavation shall only be to the length, width, and depth necessary to install a new curb box at an existing curb stop, or to install a new curb stop and box, or to remove an existing curb box. Excavation shall conform to the requirements of Section R206.

New curb stops shall be placed in the trench on a precast solid concrete block support at an elevation to provide a minimum cover of 4 feet 6 inches over the service pipe. The installation shall be pressure tested under line pressure in the presence of the Project Manager, prior to backfilling. The installation shall be made watertight.

All curb boxes shall be carefully set and braced to insure that they remain in a vertical position centered on the curb stop during and after backfilling. Proper alignment and height of all new or adjusted boxes shall be maintained, until completion of the project. The top of the curb box shall be flush with the finished surface grade. Backfilling of the trench shall be done in a manner so as to avoid damage to the service pipe, and the curb stop and box.

Upon completion of the work, the excavation shall be backfilled and the disturbed surface area restored.

R914-3.02 New Curb Stop and Box at New Service

The new curb stop and box shall be connected to the new service pipe as required, and the existing curb stop and box removed. The cost of removing the existing curb stop and box shall be included in Section R913.

R914-3.04 New Curb Stop and Box at Existing Service

The existing water service shall be shut off at the corporation stop, the existing curb stop and box disconnected and removed, and the new curb stop and box connected to the existing service.

R914-3.05 New Curb Box Assembly

The existing curb box assembly shall be replaced with a new curb box assembly. Prior to installation, the curb stop shall be checked for proper operation. Defective curb stops shall be replaced as ordered by the Project Manager.

R914-3.06 Adjust Existing Curb Box/Water Meter Box Assembly

Existing boxes shall be adjusted to the required finished grade elevation. Prior to adjusting the box, the Water Bureau shall check the curb stop and box to insure that it is functioning properly and the shut off rod is attached. The Water Bureau shall be given 10 days advance notice of intent to do the work. Defective curb stops and boxes shall be replaced only as approved by the Project Manager.

R914-3.07 Relocate Existing Curb Box Assembly

The existing curb box assembly shall be removed and reinstalled in its new location. The existing curb box assembly shall be carefully removed so as not to cause any damage to the assembly.

R914-3.08 Remove Existing Curb Box/Water Meter Box Assembly

The existing boxes on abandoned services shall be removed.

R914-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of curb stops and boxes, or water meter boxes actually installed, adjusted, relocated, or removed.

R914-5 BASIS OF PAYMENT

R914-5.01 General all Items

The unit price bid shall include the cost of: verifying the location and disposition of services; preparation and submittal of service record information and cards; pavement saw cutting; and furnishing all labor, material and equipment necessary to complete the work.

R914-5.02 New Curb Stop and Box at New Service

The unit price bid shall include the cost of: furnishing and installing the curb stop; curb box assembly; concrete block; connecting to water service pipe; pressure testing the curb stop; final adjustment of the curb box to satisfactory grade and alignment; fittings and materials necessary to connect the curb stop; and removal of the existing curb stop and box, and water meter box where required.

R914-5.03 New Curb Stop and Box at Existing Service

In addition to the items in Section R914-5.02, the unit price bid shall also include the cost to shut down the service at the corporation stop, or shutting down the water main; and removal of the existing curb stop and box, or water meter box, where required.

R914-5.04 Install New Curb Stop

The unit price bid shall include the items in Section R914-5.02, except that a new curb box assembly will not be included.

R914-5.05 Replace Existing Curb Box Assembly

The unit price bid shall include the cost of: removing the existing curb box assembly; furnishing and installing the new curb box assembly; checking the existing curb stop for defects; final adjustment of the curb box to satisfactory grade and alignment.

R914-5.06 Adjust Existing Curb Box Assembly

The unit price bid shall include the cost of: checking the existing curb stop and box assembly for defects; adjusting existing curb box to finished grade.

R914-5.07 Relocate Existing Curb Box Assembly

The unit price bid shall include the cost of: removing and reinstalling the assembly at another location.

R914-5.08 Remove Existing Curb Box

The unit price bid shall include the cost of: removing the existing curb box. Abandoned curb boxes removed in areas of surface reconstruction or trench and culvert excavation, shall be considered as general excavation, and removal will be included under Sections R203 or R206.

R914-5.09 Adjust Existing Water Meter Box

The unit price bid per each adjustment shall include the cost of: adjusting an existing water meter box to grade.

R914-5.10 Remove Existing Water Meter Box

The unit price bid per each removal shall include the cost of: removing the water meter box.

R914-5.11 Excavation, Backfill and Surface Restoration

Excavation, furnishing and placing of bedding and select granular backfill, and surface restoration will be paid for under separate bid items or included in the unit price bid for the item as indicated in the item description. No separate payment shall be made for placement of select backfill excavated from the trench

Payment will be under:

ITEM NO.	ITEM	PAY UNIT
R914.01XX	Furnish and Install New X" Curb Stop and Box at New Water Service	Each
R914.02XX	Furnish and Install New X" Curb Stop and Box at New Water Service (Including Excavation and Backfill)	Each

ITEM NO.	ITEM	PAY UNIT
R914.03XX	Furnish and Install New X" Curb Stop and Box at New Water Service (Including Excavation, Backfill and Surface Restoration)	Each
R914.04XX	Furnish and Install New X" Curb Stop and Box at Existing Water Service	Each
R914.05XX	Furnish and Install New X" Curb Stop and Box at Existing Water Service (Including Excavation and Backfill)	Each
R914.06XX	Furnish and Install New X" Curb Stop and Box at Existing Water Service (Including Excavation, Backfill and Surface Restoration)	Each
R914.07XX	Furnish and Install New X" Curb Stop	Each
R914.08XX	Furnish and Install New X" Curb Stop (Including Excavation and Backfill)	Each
R914.09XX	Furnish and Install New X" Curb Stop (Including Excavation, Backfill and Surface Restoration)	Each
R914.10	Replace Existing Curb Box Assembly	Each
R914.11	Replace Existing Curb Box Assembly (Including Excavation and Backfill)	Each
R914.12	Replace Existing Curb Box Assembly (Including Excavation, Backfill and Surface Restoration)	Each
R914.13	Adjust Existing Curb Box	Each
R914.14	Adjust Existing Curb Box (Including Excavation and Backfill)	Each
R914.15	Adjust Existing Curb Box (Including Excavation, Backfill and Surface Restoration)	Each
R914.16	Relocate Existing Curb Box Assembly	Each
R914.17	Relocate Existing Curb Box Assembly (Including Excavation and Backfill)	Each
R914.18	Relocate Existing Curb Box Assembly (Including Excavation, Backfill and Surface Restoration)	Each
R914.19	Remove Existing Curb Box Assembly	Each
R914.20	Remove Existing Curb Box Assembly (Including Excavation and Backfill)	Each
R914.21	Remove Existing Curb Box Assembly (Including Excavation, Backfill and Surface Restoration)	Each
R914.22	Adjust Existing Water Meter Box	Each
R914.23	Adjust Existing Water Meter Box (Including Excavation and Backfill)	Each
R914.24	Adjust Existing Water Meter Box (Including Excavation, Backfill and Surface Restoration)	Each
R914.25	Remove Existing Water Meter Box	Each
R914.26	Remove Existing Water Meter Box (Including Excavation and Backfill)	Each
R914.27	Remove Existing Water Meter Box (Including Excavation, Backfill and Surface Restoration)	Each

SECTION R915 - RELOCATE WATER SERVICE METER

R915-1 DESCRIPTION

The work shall consist of relocating existing service meters at locations as shown on the plans and as directed by the Project Manager.

R915-2 MATERIALS

Inside meter setting shall be a Ford "Handyhorn" with pack joint connections and ball valves. The "Handyhorn" shall be the same size as the existing service entering inside the house or building.

Inlet valve shall be Ford Ball Valve.

Outlet valve shall be Ford Ball Valve with drain and handle.

Pack joints shall be manufactured by Ford as designed for specific type of pipe.

The Contractor shall verify the size and type of materials required for each meter setting before installation.

R915-3 CONSTRUCTION DETAILS

The Water Bureau Meter Department shall be notified before starting the meter relocation. The Contractor shall notify the Water Customer 48 hours in advance that this work is to be done.

The existing meter shall be removed from its meter pit/vault and stored in the customer's house or building unless directed otherwise.

The existing meter pit/vault shall be removed and backfilled and the surface restored.

The existing meter shall be installed inside the house or building unless directed otherwise by the Water Bureau Meter Department or the Project Manager. If the meter requires replacement, it will be furnished by the Water Bureau and be delivered by the Contractor to its designated location. The existing meter (if replaced) shall be delivered to the Water Bureau, 401 Dewey Avenue, Rochester, New York.

The new installation should be as close as possible to the point of entry of the supply line inside the house or building. The meter shall have easy access with a minimum clearance of 24 inches from the floor and 30 inches from the overhead ceiling. The meter shall be installed in the horizontal and up-right position. The length of service cut out shall be the minimum length necessary to install the "Handyhorn" and valves. Caution shall be taken using an electrical jumper across the length of service cut out until installation is complete. A permanent electrical bond strap shall be installed across the completed installation.

All meters lost or damaged as a result of the Contractor's operation shall be replaced at the Contractor's expense.

R915-4 METHOD OF MEASUREMENT

The quanitity paid for will be the number of service meters actually relocated.

R914-5 BASIS OF PAYMENT

The unit price bid shall include the cost of notifying the WaterBureau Meter Department and Water Customers; all excavation, backfill and surface restoration; furnishing and installing the inside meter setting including valves, "Handyhorn" and electrical bond straps; removing the existing meter pit/vault; delivering new and existing meters to and from the Water Bureau when replaced; installing the existing meter or new meter in the new setting; and furnishing all labor, material and equipment necessary to complete the work.

Cost to provide new meters shall not be included in this item, as they are furnished by the Water Bureau.

Payment will be under:

ITEM NO.	ITEM	PAY UNIT
R915.01XX	Relocate X" Water Service Meter	Each

SECTION R916 - TEMPORARY BYPASS

R916-1 DESCRIPTION

The work shall consist of the installation of temporary bypass pipe, connections, and fire hydrants as shown on the plans and as directed by the Project Manager.

R916-2 MATERIALS

Pipe, hose, and other materials furnished for use in conjunction with the temporary bypass pipe and connections, shall meet the requirements of Section R901, and shall be fully adequate to withstand the pressure indicated and all other conditions of use. Pipe and fittings shall provide adequate watertightness before being put into service. Hose made of vinyl shall not be allowed. Temporary fire hydrants shall have a 4-1/2 inch diameter National Standard threaded nozzle.

R916-3 CONSTRUCTION DETAILS

R916-3.01 General

Temporary bypass shall include pipe, hoses, necessary outlets and fittings to each service connection, and available fire hydrant. The temporary bypass lines shall be maintained in safe and operative condition at all times. The bypass shall be mounded over with asphalt wherever it crosses a street, driveway or sidewalk, to minimize interference with vehicle and pedestrian traffic. Where so ordered by the Project Manager, the bypass pipe shall be entrenched and buried. Lights and barricades needed to protect the work and the public, shall be furnished and properly maintained.

Upon completion of the work, the temporary bypass pipe and related appurtenances shall be removed, and the disturbed surface area restored. Surface restoration shall be in accordance with Section R901.

Bypass pipe crossing streets shall be installed in a trench. The existing pavement shall be saw cut and removed to a depth sufficient to contain the bypass pipe.

Bypass lines shall be disinfected and flushed prior to connection to the customers service line.

R916-3.02 Source of Water to Feed Bypass

The City shall provide a source of water of a sufficient pressure to feed the temporary bypass line. Such source shall be from an existing hydrant, tap, or water main, and shall be at a reasonably close location.

R916-3.03 Temporary Fire Hydrants

Temporary fire hydrants shall be installed where indicated on the plans, where an existing hydrant is put out of service, or where ordered by the Project Manager. Temporary fire hydrants shall be required on temporary bypass pipe which is 4 inch in diameter or larger in size.

R916-3.04 24 Hour Maintenance

The Contractor shall be responsible for maintenance and repair of all temporary bypass service and pipe. The Contractor shall be equipped to make all repairs necessary, at the project site, for the duration of the bypass installation. The Water Bureau shall be provided with a 24 hour emergency telephone number at which the Contractor may be reached, in case it is necessary to make any repairs.

R916-3.05 Temporary Service Connection

The Water Bureau shall be given a minimum of 10 working days advance notice of intent to do any work that will affect service to customers. All affected water service customers shall be notified by the Contractor 24 hours in advance of any service disruption. The customer's service line shall be shut off, and the bypass connected to the service line. After the water main and all water service pipes have been restored to normal conditions, service shall be restored to the customer, and the temporary connection disconnected.

R916-4 METHOD OF MEASUREMENT

R916-4.01 Temporary Bypass Pipe

The quantity to be measured for payment shall be the number of linear feet of temporary bypass pipe installed.

R916-4.02 Temporary Service Connections

The quantity to be measured for payment shall be the number of temporary connections to customers' water services completed.

R916-4.03 Temporary Fire Hydrants

The quantity to be measured for payment shall be the number of temporary fire hydrants installed.

R916-5 BASIS OF PAYMENT

R916-5.01 Temporary Bypass Pipe

The unit price bid shall include the cost of: furnishing and installing bypass pipe; making all connections to water sources; temporary surface restoration; burying bypass pipe where required; protection including but not limited to lights and barricades; 24 hour maintenance; disinfecting and flushing bypass pipe; pavement saw cutting; removal of the temporary bypass lines; all excavation, backfill, and surface restoration; and furnishing all labor, material and equipment necessary to complete the work.

R916-5.02 Temporary Service Connections

The unit price bid shall include the cost of: furnishing and installing all material required to connect the bypass pipe to the customers' water system; including but not limited to hose pipe; shut off of the customers' service line; making the connection; removing the connection; temporary surface restoration; burying service connection pipe where required; lights and barricades; 24 hour maintenance; disinfecting and flushing service connection pipe; pavement saw cutting; all excavation, backfill, and surface restoration; and furnishing all labor, material and equipment necessary to complete the work.

R916-5.03 Temporary Fire Hydrants

The unit price bid shall include the cost: of furnishing, installing, and removing temporary fire hydrants; connections; and furnishing all labor, material and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R916.01XX	X" Temporary Bypass Pipe	Linear Foot
R916.02	Temporary Service Connection - 2" and Smaller	Each
R916.03	Temporary Service Connection - Larger than 2"	Each
R916.04	Temporary Fire Hydrant	Each

SECTION R917 - HYDRANT

R917-1 DESCRIPTION

The work shall consist of the installation of new hydrants, and relocating, or removing existing hydrants, as shown on the plans and as directed by the Project Manager.

R917-2 MATERIALS

R917-2.01 Hydrants

Hydrants shall conform to the requirements of ANSI/AWWA C502, City of Rochester approved. City of Rochester is standardized on the U.S. Pipe Metropolitan Fire Hydrant.

Hydrants shall be 5-1/4 inch, dry-barrel, breakable hydrants, for 5 foot 6 inch bury. Each hydrant shall have a 1-1/2 inch pentagon operating nut, two 2-1/2 inch National Standard hose connections, and one 4-1/2 inch National Standard pumper connection. Hydrants shall be open-left. Inlet connection shall be mechanical joint.

R917-2.02 Extension Kits

Extension kits shall be used for height adjustment of Metropolitan Fire Hydrants as manufactured by U.S. Pipe, or approved equivalent.

Extension kits are available in 6 inch increments with maximum of 24 inch allowed; and shall include rod and barrel units, plus nonbreakable rod and barrel couplings complete with gaskets and fasteners.

R917-2.03 Hardware

All hardware shall be made of cold formed, high strength, low-alloy steel (Cor-ten), ASTM A242.

R917-2.04 Hydrant Marking Post

Hydrant marking posts shall be painted, uniform flanged channel sections, 10 foot long standard sign posts at 3.0 pounds per foot and without holes. The exposed area (7 feet) shall be repainted with the paint used for the hydrant.

R917-2.05 Paint

Paint for hydrants shall be Brunning Silathane No. 1235, Yellow; Rustoleum No. 7443, John Deere Yellow; or approved equivalent.

R917-2.06 Thrust Blocks and Plugs

Thrust blocks and plugs shall conform to the requirements of Section R901.

Thrust blocks at hydrants shall be of the size used for 6" 90° bends.

R917-2.07 Bedding, Backfill, and Surface Restoration

Hydrant drain material shall be No. 2 crushed stone conforming to the requirements of NYSDOT Section 703-02.

Plastic barrier shall be 6 mil polyethylene.

Bedding, backfill, and surface restoration materials and methods of placement shall conform to the requirements of Section R901.

R917-3 CONSTRUCTION DETAILS

R917-3.01 General

All work shall be coordinated with the Water Bureau. The Water Bureau shall operate all valves and appurtenances needed to do the work. The Water Bureau shall be notified a minimum of 10 working days in advance of intent to do any work requiring the operation of valves and appurtenances; and a minimum of 2 working days advance notice when operation of valves and appurtenances is required for the actual work. All valves and appurtenances are to be operated only by authorized representatives of the Water Bureau.

The Water Bureau dispatcher shall be immediately notified by the Contractor when existing fire hydrants are put out of service. The dispatcher shall inform the Fire Department, and the out of service hydrants shall be red tagged. The dispatcher shall be notified when hydrants are placed back in service.

All removed hydrants shall remain the property of the Water Bureau and shall be delivered to the Water Bureau, 401 Dewey Avenue, Rochester, New York. A written receipt shall be obtained stating the number of castings returned and who received them, and a copy of the receipt shall be filed with the Project Manager.

R917-3.02 Installation

Excavation shall be to a depth which will permit the connection of the hydrant to the branch pipe and provide a minimum of 4 feet 6 inches cover over the branch and valve. Excavation shall conform to the requirements of Section R206.

Excavation for the hydrant shall also be to a depth which will provide a clearance of 2 to 6 inches between the finished ground elevation and the bottom of the breakable flange coupling on the hydrant.

Adjustment for proper height of hydrants may be accomplished by the use of mechanical joint offsets or extension kits. Extension kits shall be installed according to the manufacturer's latest instructions and as approved by the Project Manager.

For new water main installations, hydrant branch main shall be ductile iron anchoring pipe. Hydrants shall be carefully placed in a vertically plumbed position on a solid concrete block support. For hydrants being replaced or relocated on existing hydrant branch, not made of anchoring pipe, solid concrete blocks shall be used for temporary thrust blocking to allow the hydrant to be immediately pressurized. Temporary thrust blocking shall be incorporated in poured concrete thrust blocks in accordance with detail drawings. If the existing branch main is anchoring pipe; extension of the branch main shall also be anchoring pipe. Proper alignment of the hydrant shall be maintained until completion of the project.

One cubic yard of crushed stone shall be placed from the bottom of the excavation at the base of the hydrant, to a point 12 inches above the weep holes. The stone shall be covered with a plastic polyethylene sheet barrier prior to backfilling. If ground water is encountered, the stone may be omitted and the weep holes plugged. The Water Bureau shall be notified in writing when weep holes are plugged.

All hydrants shall be brush painted with a paint approved by the Water Bureau. All scrapes shall be repainted on both new and relocated hydrants, and one overall coat of paint applied to each hydrant. Holly hydrants shall have the dome painted with white enamel paint.

All new hydrant installations shall be pressure tested and shall be made watertight. New hydrant installations shall be red tagged until they are put into active service. Red tags shall be supplied by and obtained from the Water Bureau, and installed on the hydrant.

Hydrant marker posts shall be installed with hydrants, only at the locations as indicated on the plans. Hydrant marker posts shall be set vertically plumbed in position. The selected position will be such as to minimize interference with pedestrian traffic, sidewalk snow plows, etc.

Upon completion of the work, the excavation shall be backfilled and the disturbed surface area restored.

R917-3.03 New Hydrant

The centerline of the hydrant shall be installed a minimum distance of 2 feet behind face of curb, 5 feet from driveway openings and 10 feet from poles, trees, and point of curvature on the curb radius at street intersections. A minimum distance of 6 feet shall be maintained between hydrants and hydrant branch valves. Hydrants shall be oriented with pumper nozzles at right angles to the curb, facing the pavement.

R917-3.04 Relocate Existing Hydrant

The existing hydrant and hydrant marking post shall be removed and reinstalled in a new location. Installation of the hydrant shall conform to the same installation requirements as for a new hydrant. On all hydrants to be relocated, the operating stem, main valve, valve seat, drain and drainage passages shall be cleaned and inspected. Hydrants shall be checked for proper operation after reassembly and prior to installation. The Project Manager shall be advised of any hydrants that may be unsuitable for relocation. The Project Manager will determine whether the existing hydrant should be replaced with a new hydrant. The existing hydrant marker post shall be disposed of. A new hydrant marker post shall be installed with the relocated hydrant, only at the locations as indicated on the plans.

R917-3.05 Remove Existing Hydrant

The existing hydrant, branch valve box and hydrant marking post shall be removed. The branch valve box shall remain only if the branch valve is to remain in use. The hydrant shall be returned to the Water Bureau, Materials and Equipment Building, No. 3, 401 Dewey Avenue, Rochester, New York. The existing valve box and hydrant marker post shall be disposed of.

The water main shall be exposed and the hydrant removed from the branch pipe. On abandoned water mains, the open end of the branch pipe shall be sealed with a 12 inch plug of concrete. On live water mains, the branch line shall be cut and plugged at the branch tee according to the requirements of Section R908; or the tee removed and replaced with a new section of pipe according to the requirements of Section R906.

R917-3.06 Screw-In Type Replacement Hydrant

The existing hydrant and barrel shall be unscrewed counterclockwise. The existing frost jacket shall remain in place. The existing hydrant shall not be removed by placing a bar through the nozzle openings. The nozzle cap is to remain attached to the nozzle at all times. The existing ground collar may be required to be removed prior to the installation of the new hydrant. The frost jacket shall be covered after the existing hydrant is removed to prevent any objects, debris or material from falling into the frost jacket and to protect the public.

Prior to the installation of the new screw-in hydrant, a barrel of the proper length (4 feet 6 inches, 5 feet, or 5 feet 6 inches) shall be selected such that the centerline of the break collar shall be no less than 2 inches and no more than 6 inches above the finished grade, after the hydrant installation is complete.

After the hydrant installation is complete the hydrant shall be checked for watertightness by opening the hydrant branch valve. Any leaks that are discovered shall be repaired.

R917-4 METHOD OF MEASUREMENT

The quantity to be measured for payment shall be the number of hydrants installed, relocated, replaced, or removed.

R917-5 BASIS OF PAYMENT

R917-5.01 General-all Items

The unit price bid shall include the cost of furnishing all labor, material and equipment necessary to complete the work.

Excavation, rock excavation, furnishing and placing of bedding and select granular backfill, and surface restoration will be paid for under separate bid items. No separate payment will be made for placement of select backfill excavated from the trench.

New branch pipe, branch valves and valve boxes will be paid for under Sections R901 and R902.

R917-5.02 New Hydrant

The unit price bid shall include the cost of: furnishing and installing the hydrant; mechanical joint offsets; concrete thrust blocks; crushed stone drain and plastic sheet barrier; plugging weep holes if required; painting the hydrant; pressure testing; and connecting branch pipe to the hydrant.

Extension kits used for adjusting height of a new hydrant shall be paid for under the pay item for extension kits.

R917-5.03 New Hydrant and Screw-In Hydrant Replacement (Including Removal of Existing Hydrant)

In addition to the requirements of Section R917-5.02, the unit price bid shall also include the cost of removing and delivering existing hydrants to the Water Bureau; and connecting new branch pipe to the existing branch pipe.

Extension kits used for adjusting height of a new hydrant shall be paid for under the pay item for extension kits.

This item applies only to existing hydrants that are replaced by a new hydrant on the same branch line.

R917-5.04 Relocate Existing Hydrant

The unit price bid shall include the cost of: removing, cleaning, inspecting, reinstalling and painting the hydrant; removing and disposing of existing hydrant marking post; furnishing and installing mechanical joint offsets; concrete thrust blocks; crushed stone drain and plastic sheet barrier; pressure testing; connecting branch pipe to the hydrant; and connecting new branch pipe to the existing branch pipe.

Extension kits used for adjusting height of the hydrant shall be paid for under the pay item for extension kits.

R917-5.05 Remove Existing Hydrant

The unit price bid shall include the cost of: disconnecting and delivering the hydrant to the Water Bureau; removing and disposing of existing branch valve box and hydrant marking post; and plugging with concrete the open end of hydrant branches that are to be abandoned.

Plugging branch tees, or removing tees and replacement with insertion sleeves on active water mains, shall be paid for under separate bid items.

The Remove Existing Hydrant item will only be paid when an existing hydrant is removed and a new hydrant is not set on the same branch line.

R917-5.06 Hydrant Marking Post

The unit price bid shall include the cost of: furnishing, installing, and painting hydrant marking posts; excavation, backfill and surface restoration; and furnishing all labor, material and equipment necessary to complete the work.

R917-5.07 Extension Kit

The unit price bid shall include the cost of: furnishing and installing the extension kit; and removing and reinstalling the existing hydrant where required.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
R917.01	New Hydrant	Each
R917.02	New Hydrant (Including Removal of Existing Hydrant)	Each
R917.03	New Screw-In Type Replacement Hydrant (Including Removal of Existing Hydrant)	Each
R917.04	Relocate Existing Hydrant	Each
R917.05	Remove Existing Hydrant	Each
R917.06	Hydrant Marking Post	Each
R917.07	6" Hydrant Extension Kit	Each
R917.08	12" Hydrant Extension Kit	Each
R917.09	18" Hydrant Extension Kit	Each
R917.10	24" Hydrant Extension Kit	Each

MONROE COUNTY PURE WATERS STANDARD SPECIFICATIONS
SPECIFICATION LISTING

GENERAL

The following Monroe County Pure Waters Standard items are acceptable for use as City of Rochester Standard Specifications. The work shall conform to the requirements of the appropriate Monroe County Pure Waters Specification for these items:

ITEM NO.	ITEM	PAY UNIT
C203.0751	Select Granular Fill Over Pipes	CY
C203.0951	Crushed Stone	CY
C206.0501	Trench Excavation	CY
C206.0502	Trench Excavation - Solid Rock Blasting Method	CY
C206.0503	Trench Excavation - Solid Rock Mechanical Method	CY
C206.0504	Test Pit Excavation	CY
C206.0601	Abandon Existing Sewer	CY
C552.0101	Permanent Timber Sheet Piling	SF
C552.0301	Temporary Timber Sheet Piling	SF
C552.0501	Safe Operation Sheet Piling	SF
C555.010301	Concrete Cradle or Encasement	CY
C603.0412XX	Vitrified Clay Pipe, Extra Strength, XX" Diameter	LF
C603.6003XX	Reinforced Concrete Pipe, Class III, Steel Ring Joints, XX" Diameter	LF
C603.6004XX	Reinforced Concrete Pipe, Class III, Rubber Gasket Joints, XX" Diameter	LF
C603.6103XX	Reinforced Concrete Pipe, Class IV, Steel Ring Joints, XX" Diameter	LF
C603.6104XX	Reinforced Concrete Pipe, Class IV, Rubber Gasket Joints, XX" Diameter	LF
C603.6203XX	Reinforced Concrete Pipe, Class V, Steel Ring Joints, XX" Diameter	LF
C603.6204XX	Reinforced Concrete Pipe, Class V, Rubber Gasket Joints, XX" Diameter	LF
C603.945101	Cast Iron Soil Pipe Lateral, Extra Heavy, 4" Diameter to 6" Diameter	LF
C603.9451XX	Cast Iron Soil Pipe Lateral, Extra Heavy, XX" Diameter	LF
C603.945201	Cast Iron Soil Pipe Lateral Riser, Extra Heavy, 4" Diameter to 6" Diameter	LF
C603.9452XX	Cast Iron Soil Pipe Lateral Riser, Extra Heavy, XX" Diameter	LF
C603.9581XX	Ductile Iron Pipe, Class 52, XX" Diameter	LF
C603.9908XX	Polyvinyl Chloride Pipe, SDR 35, XX" Diameter	LF
C603.9909XX	Polyvinyl Chloride Pipe, SDR 26, XX" Diameter	LF
C603.9910XX	Polyvinyl Chloride Pipe, SDR 21, XX" Diameter	LF

ITEM NO.	ITEM	PAY UNIT
C603.992101	Polyvinyl Chloride Pipe Lateral, SDR 21, 4" Diameter to 6" Diameter	LF
C603.9921XX	Polyvinyl Chloride Pipe Lateral, SDR 21, XX" Diameter	LF
C603.992201	Polyvinyl Chloride Pipe Lateral Riser, SDR 21, 4" Diameter to 6" Diameter	LF
C603.9922XX	Polyvinyl Chloride Pipe Lateral Riser, SDR 21, XX" Diameter	LF
C604.044801	Manhole, 4' Diameter, Precast Base, up to 6.0' Deep	EA
C604.044802	Manhole, 4' Diameter, Cast-in-Place Base, up to 6.0' Deep	EA
C604.044803	Additional Depth of 4' Diameter Manhole	LF
C604.046001	Manhole, 5' Diameter, Precast Base, up to 6.0' Deep	EA
C604.046002	Manhole, 5' Diameter, Cast-in-Place Base, up to 6.9' Deep	EA
C604.046003	Additional Depth of 5' Diameter Manhole	LF
C604.0499XX	Junction Chamber No. X	LS
C604.076001	Connect Existing 4" to 6" Lateral to New Sewer	EA
C604.0760XX	Connect Existing XX" Lateral To New Sewer	EA
C604.076103	Connect New 4" to 6" Lateral to Existing or New Sewer	EA
C604.0761XX	Connect New XX" Lateral to Existing or New Sewer	EA
C604.0762XX	Connect New XX" Sewer to Existing Manhole	EA
C604.0763XX	Connect New XX" Sewer to Existing Stone Box Sewer	EA
C604.0764XX	Connect New XX" Sewer to Existing Sewer with Concrete Collar	EA
C604.0765XX	Connect New XX" Sewer to Existing Sewer with Elastomeric Sleeve	EA
C604.0766XX	Connect New Manhole to Existing XX" Sewer	EA
C604.0767XX	Connect New Receiving Basin to Existing Lateral	EA
C604.0768XX	Connect New Manhole to Existing or New XX" Sewer with Outside Drop Connection	EA
C604.0769XX	Connect Existing Manhole to Existing or New XX" Sewer with Outside Drop Connection	EA

GENERAL PROVISIONS FOR MONROE COUNTY PURE WATERS SPECIFICATIONS

1. GENERAL

In general, Sections 200 through 700 of the New York State Department of Transportation (NYSDOT) Specifications of January 2, 1990, and all addenda in effect on the date of advertising for bid shall apply, except where modified in these specifications. In addition, any subsections in NYSDOT Section 100 which are included as part of the requirements in NYSDOT Sections 200 through 700 shall apply. Where reference is made to New York State, State Department of Transportation, Commissioner, et cetera, the appropriate City of Rochester department or official shall be substituted.

2. SCOPE OF WORK

The work to be done in accordance with these specifications consists of furnishing of plant, equipment, superintendence, labor, skill, material, and all other items necessary for the construction and/or replacement of sewers and appurtenances in the Rochester Pure Waters District, Monroe County, New York. The Contractor shall perform all work required for such construction including the furnishing of all engineering necessary for the layout and construction of the work, in accordance with the drawings and specifications and subject to the terms and conditions of the Contract, complete and ready for use.

3. CONTRACT DRAWINGS

The work shall be in accordance with the contract drawings listed on page A-4 of the Agreement.

4. TESTING AND CHECKING

A. Laboratory testing and checking required by the specifications shall be provided and paid for by the Contractor except when testing is specified to be done by the Owner or Engineer. Such tests include but are not necessarily limited to the following:

1. Laboratory Maximum Density Tests. The Contractor shall furnish all necessary samples for laboratory tests and shall provide assistance and cooperation during field tests. The Contractor shall plan his operations to allow adequate time for laboratory tests and to permit taking of field density tests during compaction.

2. Concrete Design, Mix Tests and Field Test Cyclinder

a) Strength. Concrete for manholes, junction chambers and receiving basins shall be Class A with Type II cement proportioned and mixed for a twenty-eight (28) day compressive strength of 4,000 psi when tested in accordance with ASTM, Standard C3l and C39.

b) Design Mix. All costs in connection with developing concrete mix designs conforming to specification requirements, and for testing materials and mixes for conformance with the specifications prior to use, shall be borne by the Contractor. This work shall be performed by a testing laboratory approved by the Engineer. Except as otherwise specified, design of the mix shall be in accordance with ACI 211.1. At least thirty-five (35)days before the concrete is required, the Contractor shall submit to the Engineer for approval, complete information on the concrete design mix proposed for use. The information shall include, but is not limited to the following:

Proposed design mix and results of strength tests. If a previously established design mix is proposed, copies of recent test results made (within the past six (6) months) by a recognized testing laboratory on a mix identical with that proposed for use, shall be submitted.

Source of aggregates and cement proposed for use.

Adjustments to Mix. If the mix adopted fails to produce concrete meeting the requirements for strength and placability, the Engineer, at his discretion, may order additional cement or adjustment of mix proportions. Any additional costs involved shall be borne by the Contractor.

d) Field Test Cylinders. During the progress of the work, unless otherwise waived by the Engineer, a set of five (5) six (6) inch by twelve (12) inch cylinders shall be taken for each 50 cubic yards of concrete placed or fraction thereof with at least one set taken for each day's placement of concrete. For each set of test cylinders, two cylinders will be tested at 7 days, two at 28 days, and if the 28 day cylinders are unsatisfactory, the remaining cylinder will be tested at 40 days. Making and curing of cylinders shall be in accordance with ASTM Standard C31.

All sampling and testing shall be in accordance with applicable ASTM Standards, except that sampling of fresh concrete shall be taken from the middle two-thirds of the batch.

B. The Owner shall be responsible for field compaction density tests. Where test results indicate insufficient compaction and additional compaction is required, the Contractor shall be responsible for all field compaction density retesting, until sufficient compaction is achieved.

5. FINAL LOCATION OF SEWER

A. The Owner reserves the right to alter the location of the sewer as shown on the drawings, by Addendum during the bidding period, or by Change Order after the receipt of bids, as may be required by procurement of easements, procurement of additional sub-surface information, or as may be required by the NYSDOT, or other considerations.

B. If any changes are made by Change Order, payment for unit price items will be made in accordance with unit prices as bid for the actual work installed. Any change required in payment for lump sum items will be negotiated as per GENERAL CONDITIONS, prior to start of work.

6. DUST CONTROL

The Contractor shall take all necessary measures to control dust resulting from his operations and to prevent spillage of excavated material on public roads. When directed by the Engineer, the Contractor shall sprinkle water where directed and in such quantities and at such frequencies as may be required to control such dust and prevent it from becoming a nuisance to the surrounding area, at no additional cost to the Owner. All roads must be maintained dust free at all times. Daily cleaning will be required.

7. EXISTING UTILITIES AND STRUCTURES

A. Definition. The term "existing utilities" shall be deemed to refer to both publicly and privately owned utilities such as storm drains, sanitary sewers, water lines, steam, gas, electrical and telephone services and appurtenances.

B. Locations. Where existing utilities and structures are indicated on the drawings it shall be understood that all of the existing utilities and structures affecting the work may not be shown, and that the locations of those shown are approximate only. It shall be the responsibility of the Contractor to ascertain the actual extent and exact location of existing utilities and structures. In every instance the Contractor shall notify the proper authority having jurisdiction and obtain all necessary directions and approvals before performing any work in the vicinity of existing utilities.

C. Prevention of Disruption and Damage. The work shall be carried out in a manner to prevent disruption of existing services and to avoid damage to the existing utilities. Any damage resulting from the work shall be promptly repaired by the Contractor at his own expense in a manner approved by the Engineer and further subject to the requirements of any authority having jurisdiction. Where it is required by the authority having jurisdiction that they perform their own repairs or have them done by others, the Contractor shall be responsible for all cost thereof.

D. Support and Protection. Where excavations by the Contractor require any utility lines or appurtenant structures to be temporarily supported and otherwise protected during the construction work, such support and protection shall be provided by the Contractor. All such work shall be performed in a manner satisfactory to the Engineer and the respective authority having jurisdiction over such work. In the event the Contractor fails to provide proper support or protection to any existing utility, the Engineer may at his discretion, have the respective authority provide such support or protection as may be necessary to insure the safety of such utility, and the costs of such measures shall be paid by the Contractor.

8. ACCESS ROADS

A. The Contractor shall construct and maintain such temporary access roads as he may need to install the work. Access roads shall be located within the easement lines obtained by the Owner unless the Contractor independently secures additional easements for his use and convenience. Additional easements must be approved by the Owner.

B. At the completion of the work, the surface of land used for access roads within the boundaries of Owner-obtained easements shall be restored as hereinafter specified.

9. WORK ON PRIVATE PROPERTIES AND IN PUBLIC STREETS

A. Work Areas and Easements. The Contractor shall restrict his operations to the areas within permanent and temporary easements if such easements have been obtained by the Owner, and to areas within existing street rights of way.

B. Temporary Easements Obtained by Contractor. Temporary easements required by the Contractor for additional work areas shall be obtained and paid for by him.

All temporary easements obtained by the Contractor shall contain a provision holding the Rochester Pure Waters District, Monroe County, and the City of Rochester harmless to any and all claims thereto related. The agreement shall bear the signature of the Owner of the land. Copies of all temporary easements shall be supplied to the Engineer prior to utilization of the temporary easements.

C. Temporary Fencing

1. Prior to start of work, the Contractor shall have his job surveyor locate the temporary and permanent easement lines. A continuous snow type fence shall be installed and maintained in place along these lines during construction operations until this area has been restored to its original condition. The fence shall be in place five (5) days in advance of work in any area. No construction activity, access, storage or other use shall take place outside of the fencing.

2. Snow type fencing for individual tree protection during the construction shall be installed and maintained by the Contractor as required or ordered by the Engineer.

D. County and City Roads. The Contractor will be responsible for obtaining all necessary county and city road work permits as required by the agency having jurisdiction. Certain roads and highways are posted by municipal agencies at various times during the year for weight limits. The Contractor is advised to identify these roads and highways which he plans to use as access to the sites of his operations and to schedule his operations accordingly. In some cases, special bonds or indentations to the municipal agencies by the Contractor may be required in order for the Contractor to obtain permission to use these roads and highways when they are posted.

SELECT GRANULAR FILL OVER PIPES

GENERAL

The provisions of NYSDOT Section 203 shall apply with the following modifications:

MATERIALS

The material shall conform with NYSDOT Subsection 203-2.02C except that the gradation shall be as follows:

Sieve Size Designation	**Percent Passing By Weight**
2 inch	100
1/4 inch	30 - 65
No. 40	5 - 40
No. 200	0 - 10

METHOD OF MEASUREMENT

The quantity of select granular fill over pipes to be paid for shall be in cubic yards computed in the final compacted position. The quantity shall be obtained by multiplying the net cross sectional area within the payment limits shown on the plans by the actual length installed and accepted.

Payment will be made under:

ITEM NO.	**ITEM**	**PAY UNIT**
C203.0751	Select Granular Fill Over Pipes	Cubic Yard

CRUSHED STONE

GENERAL

The provisions of NYSDOT Section 203 shall apply with the following modifications:

DESCRIPTION

This work shall consist of furnishing, placing and compacting crushed stone as shown on the plans or directed by the Engineer.

MATERIALS

The materials shall meet the requirements of NYSDOT Subsection 703-02, Material Designation 703-0201, and shall be furnished in the sizes or combination of sizes indicated on the plans or ordered by the Engineer.

CONSTRUCTION DETAILS

The construction details of NYSDOT Subsection 203-3 shall apply except for the following modifications:

When crushed stone is used for pipe bedding it shall be placed, compacted and shaped to fit the lower half of the pipe to the dimensions shown on the plans. Crushed stone shall be deposited in horizontal layers not exceeding 6 inches in thickness prior to compaction.

METHOD OF MEASUREMENT

The method of measurement of NYSDOT Subsection 203-4 shall apply except for the following modifications:

The quantity of crushed stone to be paid for shall be the number of cubic yards computed in the final compacted position within the payment lines shown on the plans or as ordered by the Engineer.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C203.0951	Crushed Stone	Cubic Yard

TRENCH EXCAVATION

DESCRIPTION

The description of NYSDOT Subsection 206-1 shall apply.

MATERIALS

1. Trench Excavation:

Shall include all earth, unstable and unsuitable material, loose rock, all pavement courses, all types of sewers, debris and all other materials except solid rock.

2. Trench Excavation - Solid Rock:

Shall include all pieces of ledge or bed rock, boulders or masonry larger than one (1) cubic yard in volume that requires drilling and/or blasting for removal.

3. Test Pit Excavation:

Shall be as specified for "Trench Excavation".

CONSTRUCTION DETAILS

The construction details of NYSDOT Subsection 206-3 shall apply with the following modifications:

1. The length of trench to be opened at one time shall be kept within reasonable limits, and unless otherwise permitted or directed by the Engineer, shall not be longer than 1 structure-to-structure run or one hundred feet, whichever is less. Lateral trenches shall not be open on both sides of the street at the same time, unless approved by the Engineer.

2. The Contractor shall be responsible for the adequate shoring and/or bracing of any existing utilities encountered during the excavation. Such utilities shall be braced or shored in a manner acceptable to the local jurisdictional agency having authority over the utility encountered. It shall be the responsibility of the Contractor to prevent damage to or displacement of utilities, and to work with and request the concurrence of the utility company's representative in this matter. No separate payment will be made for shoring and/or bracing for utility lines.

3. Rock Removal, Blasting Method:

A. The Contractor shall make his own independent investigations and assessment of the quantity of rock to be removed and the difficulties and hazards attendant thereto. The Owner and the Engineer reserve the right to require removal of rock by line drilling and wedging if the Contractor performs blasting operations in violation of specification performance requirements.

B. Blasting shall be done only by qualified personnel. Charges shall be of such power, spacing and timing that the blasts will not make the excavation unduly large, shatter adjoining rock, damage or endanger adjacent utilities or other structures. Each blast shall be covered with heavy timber or steel mats. Existing utility lines and other structures exposed during construction shall be adequately protected from damage. The Contractor shall be fully liable for all damage or nuisance caused by the blasting operations, and shall promptly repair all damage at his own expense.

C. Explosives shall be stored, transported, handled, and used as provided in the Labor Law of the State of New York and in the Industrial Code Rules promulgated thereunder by the Board of Standards and Appeals of the New York State Department of Labor relating to the types of work to be performed under this Contract, and the New York State Fire Prevention Code as adopted by the local municipality.

D. Explosives shall be stored in magazines suitable to the local Fire Department. Storage of explosives at individual work sites is not allowed except for that amount of explosives required for a day's work and where the Contractor has demonstrated that such storage shall be in conformity with local and State requirements, as well as requirements of the local Fire Department. Any explosives not used in the day's work shall be removed from the individual work sites overnight and returned to the supplier. In no case shall the Contractor store explosives at unattended sites.

E. The Contractor shall be solely responsible for the consequences of his drilling and blasting operations. He shall conduct such operations in a manner so as not to endanger life or property. The Contractor shall drill holes in locations and place charges of the type and quantity which when detonated shall not cause excavations which are unduly large. All rock disturbed beyond the pay limits shall be removed and the area between the rock and the wall filled with lean or structural concrete, as determined by the Engineer.

F. The Contractor shall give notice of his intention to detonate charges at least 24 hours in advance of the detonation to the Engineer, local municipalities, local Fire Departments, local Police Departments, and owners of all utilities within 200 feet of the work site. The Contractor shall signal his intention to detonate charges with the use of a whistle or siren clearly audible from a distance of 700 feet from the point of detonation. Signals shall be given both five (5) minutes and one (1) minute prior to detonation. An all clear signal shall also be given.

G. All blasting complaints shall be reported to the Engineer within 24 hours of receipt thereof. Such reports shall include the name, address, date, time received, date and time of blast complained about, and a brief description of the alleged damages or other circumstances upon which the complaint is predicated. Each complaint shall be assigned a separate number, and all complaints shall be numbered consecutively in the order of receipt. In the event more than one complaint is received from the same complainant, such later complaint shall show all previous complaint numbers registered by the same complainant. In addition, each month a summary report shall be made to the Engineer which shall indicate the date, time and name of person investigating the complaint, and the amount of damages claimed (or estimate thereof) including the amount of settlement, if any. When settlement of a claim is made, the Engineer shall be furnished with a copy of the release of claim by the claimant. The Engineer shall be notified immediately, throughout the statutory period of liability, of any formal claims or demands made by attorneys on behalf of claimants of the serving of any notice, summons, subpoena, or other legal documents incidental to litigation; and of any out-of-court-settlement or court verdicts resulting from litigation. The Engineer shall immediately be notified of any investigations, hearings or orders received from any Governmental agency, board or body claiming to have authority to regulate blasting operations.

4. Rock Removal, Mechanical Method. The provisions of "Rock Removal, Blasting Method" shall apply except that no blasting will be allowed.

5. Test pits may be ordered by the Engineer or Owner at any time after the "Notice to Proceed" and for the duration of the contract. Backfill materials and compaction shall conform with the requirements that a trench excavation would have in that area.

METHOD OF MEASUREMENT

1. General.

The quantity of excavation shall be the number of cubic yards of material measured in its original position within the payment limits shown on the plans or indicated in this item. The quantity for "Trench Excavation" shall include the hollow space inside of existing sewers and manholes designated to be removed. No payment will be made beyond these limits unless the Engineer specifically states in writing prior to the performance of the work that payment will be made to other reference limits.

2. Trench Excavation.

The bottom payment limit shall be the designed bottom of the excavation or the original rock surface, whichever is higher. The top payment limit shall be the existing surface prior to commencing work on the contract. Side payment limits shall be vertical and located as follows:

A. Pipes. Limits shall be as shown on plans and parallel to each side of pipe barrels.

B. Structures. Limits shall be eighteen (18) inches beyond and parallel to outside of footings.

3. Trench Excavation - Solid Rock.

The bottom payment limit shall be the designed bottom of the excavation. The top payment limit shall be the original rock surface. Side payment limits shall be the same as for number 2.

4. Test Pit Excavation.

The top payment limit shall be the existing surface. The bottom payment limit shall be the bottom of excavation ordered by the Engineer. Side payment limits shall be vertical and spaced four feet by eight feet.

BASIS OF PAYMENT

The unit price bid for this work shall include the cost of all labor, equipment and materials necessary to complete the work, including the costs of guarding and protection of trenches, incidental shoring and bracing for utility line supports, disposal of excavated material, and keeping the site free from earth, water, ice and snow during construction. The cost of backfill, sheeting and surface restoration will be paid for under their appropriate items.

The cost of saw cutting pavement with approved power saws along neat lines which are indicated by payment limits shown on the plans shall be included in the bid prices for Trench Excavation and/or Test Pit Excavation.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C206.0501	Trench Excavation	Cubic Yard
C206.0502	Trench Excavation - Solid Rock Blasting Method	Cubic Yard
C206.0503	Trench Excavation - Solid Rock Mechanical Method	Cubic Yard
C206.0504	Test Pit Excavation	Cubic Yard

ABANDON EXISTING SEWER

DESCRIPTION

This work shall consist of furnishing and placing a controlled density fill in existing sewers to be abandoned as shown on the plans or ordered by the Engineer.

MATERIALS

Controlled density fill shall be K-Krete or approved equal and it shall have a 28 day compressive strength of 50 to 100 p.s.i. Brick shall be first quality, sound hard-burned common brick conforming to ASTM C32 sewer brick, grade SS. Mortar shall conform to the provisions of NYSDOT Subsection 705-21.

CONSTRUCTION DETAILS

Filling shall be accomplished by a pumping method through existing manholes and ends of the existing sewers. Pumping shall be per supplier's specifications.

Open ends of the abandoned sewer shall be plugged with brick masonry.

Manholes in the abandoned portion of the sewer shall be excavated to within 3'-0" of existing ground surface. K-Krete or approved equal, shall be pumped into the sewer and manhole to the top of the sewer and to within 3'-0" of existing ground surface surrounding the manhole. Backfilling at the manhole to existing grade shall be accomplished by using Select Granular Fill.

METHOD OF MEASUREMENT

The quantity of controlled density fill shall be the number of cubic yards actually used to fill abandoned sewers and manholes as shown on the plans and/or as directed by the Engineer.

BASIS OF PAYMENT

The unit price bid for this work shall include the cost of all labor, equipment and materials necessary to complete the work, including the cost of brick masonry. The cost of excavation, backfill and surface restoration will be paid for under their appropriate items.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C206.0601	Abandon Existing Sewer	Cubic Yard

SHEET PILING

GENERAL

The provisions of NYSDOT Section 552 shall apply with the following modifications:

MATERIALS

The section modules of the piling for Temporary Timber Sheet Piling will not be shown on the plans.

CONSTRUCTION DETAILS

Sheet piling installed for permanent or temporary timber sheet piling shall be tight sheeting driven against firm undisturbed earth.

METHOD OF MEASUREMENT

The upper payment line shall be the existing surface prior to commencing work on the contract. The lower payment line shall be the designed bottom of excavation or the original rock surface, whichever is higher. The horizontal length of Safe Operation Sheet Piling shall be as authorized by the Engineer, but no payment lines will be shown on the contract plans. The quantity of sheet piling to be paid for shall be measured in square feet.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C552.010l	Permanent Timber Sheet Piling	Square Foot
C552.0301	Temporary Timber Sheet Piling	Square Foot
C552.0501	Safe Operation Sheet Piling	Square Foot

CONCRETE CRADLE OR ENCASEMENT

GENERAL

The provisions of NYSDOT Section 555 shall apply with the following modifications:

DESCRIPTION

This work shall consist of furnishing and placing Portland Cement Concrete, Class A, for sewer cradle or encasement as indicated with the plans and in accordance with the specifications.

METHOD OF MEASUREMENT

The quantity to be paid for under this work shall be the number of cubic yards obtained by multiplying the net cross sectional area shown on the plans by the actual length installed and accepted.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C555.010301	Concrete Cradle or Encasement	Cubic Yard

SEWER PIPE

DESCRIPTION

This work shall consist of the construction or reconstruction of combined, sanitary and storm sewers in accordance with these specifications and as shown on the plans.

MATERIALS

1. Vitrified Clay Pipe:

Vitrified Clay Pipe and Fittings shall be non-glazed, extra strength and shall conform, to ASTM C700. Pipe and fittings shall be furnished with factory applied compression joint material conforming to the requirements of ASTM C425.

2. Polyvinyl Chloride Pipe:

Polyvinyl Chloride Pipe and Fitting shall have bell and spigot joints with flexible elastomeric gaskets. SDR 35 pipe and fittings shall conform to ASTM D3034 type PSM or ASTM F679 with joints conforming to ASTM D3212 and F477. SDR 26 and 21 pipe and fittings shall conform to ASTM D2241, with joints conforming to ASTM D3139 and F477.

3. Reinforced, Concrete Pipe with Steel Ring Joints or Rubber Gasket Joints:

Reinforced Concrete Pipe and Fittings shall conform to ASTM C76. Pipe and fittings for steel joint pipe shall be furnished with joints formed by steel joint rings and round rubber gaskets, all in conformance with AWWA C301 or C302. Pipe and fittings for rubber gasket joints.shall be furnished with round rubber gaskets conforming to ASTM C443. Reinforced concrete pipe and fittings shall be Wall B, and of the size and class as shown on the plans and/or as directed by the Engineer. Elliptical reinforcement in circular pipe of any size will not be permitted.

4. Ductile Iron Pipe:

Ductile iron pipe shall conform to AWWA C115 and/or AWWA C151. Fittings shall conform, to AWWA C110. Joints shall conform to AWWA C111 and/or AWWA C115. Outside and inside coatings shall be asphaltic material with a minimum thickness of 1 mil that conforms to all appropriate requirements for seal coat in AWWA C104. The class of pipe, rating of fittings and type of joint shall be as shown on the plans.

CONSTRUCTION DETAILS

1. General:

A. The manufacturer shall prepare and submit to the Engineer and Contractor a requisite number of approved brochures containing complete information and instructions pertaining to the storage handling, installation and inspection of pipe, fittings, and joints furnished.

B. The manufacturer shall furnish the services of a competent field representative at the start-up of installation of each type of pipe to instruct the Contractor and Engineer with installation and inspection procedures. Prior to the installation of the first section of each type of pipe the Representative, Engineer and Contractor shall inspect the first shipment of pipe as specified hereinafter, and shall check dimensional tolerances. The Representative shall make periodic scheduled visits to the project as the work progresses and shall be present at required infiltration and exfiltration tests.

C. The manufacturer shall furnish the Engineer with required feeler gauges and other equipment that may be required for recommended and approved inspection procedures.

2. Vitrified Clay Pipe:

A. The manufacturer shall test and furnish test certificates covering all pipe supplied under the contract conforming to the test requirements as specified in ASTM C700 and C301. Test samples shall be selected from the run of pipe proposed to be furnished to the project. Unless the Engineer elects to witness such testing, the manufacturer shall select the samples for testing. The Contractor shall advise the Engineer at least two weeks in advance of the time and location of the testing.

B. Each length of pipe delivered to the job shall be inspected by the Contractor in the presence of the Engineer for dimensional tolerances and for items listed in ASTM C700. Joint tolerances shall be as specified in ASTM C700 and C425. The Contractor shall provide the Engineer with suitable templates or caliper for checking pipe dimensions. Only lengths of pipe accepted by the Engineer and so marked may be installed in the work.

C. Laying lengths except for closures and specials shall be a minimum of four (4) feet.

D. Pipe cutting will not be permitted for the main sewer, except for vitrified clay pipe stubs at manholes. The cutting of the pipe shall be done in accordance with the pipe manufacturer's recommendations and subject to the approval of the Engineer. In general, the cutting of the pipe shall be as follows: the pipe material shall be cut by using a saw or milling process, approved by the pipe manufacturer and not by using any impact device, such as a hammer and chisel, to break the pipe. The pipe shall be cut, not broken. The cut end of the pipe shall be square to the axis of the pipe and any rough edges ground smooth.

E. All joints shall be installed, made up and inspected in accordance with approved printed instructions of the manufacturer.

3. Polyvinyl Chloride Pipe:

A. The manufacturer shall test and furnish test certificates covering all pipe supplied under the contract conforming to the test requirements as specified in ASTM D2241, D3034 or F679. Test samples shall be selected from the run of pipe proposed to be furnished to the project. Unless the Engineer elects to witness such testing, the manufacturer shall select the samples for testing. The Contractor shall advise the Engineer at least two (2) weeks in advance of the time and location of the testing.

B. Each length of pipe delivered to the job shall be inspected by the Contractor in the presence of the Engineer for dimensional tolerances and for items listed in ASTM D2241, D3034 or F679. Joint tolerances shall be as specified in ASTM F477 and D3212 or D3139. The Contractor shall provide the Engineer with suitable templates or caliper for checking pipe dimensions. Only lengths of pipe accepted by the Engineer and so marked shall be installed in the work.

C. Laying lengths except for closures and specials shall be a minimum of ten (10) feet.

D. Pipe cutting will not be permitted for the main sewer, except for polyvinyl chloride pipe stubs at manholes. The cutting of the pipe shall be done in accordance with the pipe manufacturer's recommendations and subject to the approval of the Engineer. The pipe lateral shall be cut by using approved power saws. The cut end of the pipe shall be square to the axis of the pipe and any rough edges ground smooth. All cut ends shall be beveled.

E. All joints shall be installed, made up and inspected in accordance with approved printed instructions of the manufacturer.

4. Reinforced Concrete Pipe with Steel Ring Joints or Rubber Gasket Joints:

A. If steel ring joints are specified, each length of pipe shall be provided with bell and spigot ends and joints formed by steel joint rings and rubber gaskets circular in cross section, all in conformance with AWWA

C301 or C302. At the spigot end of the pipe the following reinforcing steel shall be welded to the steel joint ring:

Up to 30 inches in diameter - 6 @ #3 x 15" long
33 inches in diameter to 42 inches in diameter - 8 @ #3 x 15" long
48 inches in diameter to 60 inches in diameter - 12 @ #3 x 15" long
66 inches in diameter to 78 inches in diameter - 15 @ #3 x 15" long
84 inches in diameter to 96 inches in diameter - 18 @ #3 x 15" long

All exposed surfaces of both rings shall be protected by a corrosion resistant coating of zinc, a minimum, of .002" thick applied by an approved cleaning and metallizing process.

All joints shall be installed, made up and inspected in accordance with approved printed instructions of the manufacturer except that all joints both inside and out shall be filled with Mainstay, Sikaflex 1-A, Sonolastic NP II by Sonneborn, or approved equal.

B. If rubber gasket joints are specified, each length of pipe shall be provided with bell and spigot ends and round rubber gasket joints conforming to the requirements of ASTM C443. All joints shall be installed, made up and inspected in accordance with approved printed instructions of the manufacturer except that the outside of all joints shall be filled with Pioneer 301 thermosetting joint compound manufactured by the Daubert Chemical Company, or approved equal.

C. The manufacturer shall test and furnish test certificates covering all pipe supplied under this contract conforming to the test requirements as specified in ASTM C76 and C497. Test samples shall be selected from the run of pipe proposed to be furnished to the project. Unless the Engineer elects to witness such testing, the manufacturer shall select the samples for testing. The Contractor shall advise the Engineer at least two (2) weeks in advance of the time and location of the testing.

D. Each length of pipe delivered to the job shall be inspected by the Contractor in the presence of the Engineer for dimensional tolerances and for items listed in ASTM C76. Joint tolerances for steel ring joints shall be as specified in ASTM C76 and AWWA C301 or C302. Joint tolerances for rubber gasket joints shall be as specified in ASTM C76 and C443. The Contractor shall provide the Engineer with suitable templates or caliper for checking pipe dimensions. Only lengths of pipe accepted by the Engineer and so marked shall be installed in the work.

E. Laying lengths except for closures and specials shall be a minimum of five (5) feet.

F. Pipe cutting will not be permitted.

5. Ductile Iron Pipe:

A. All joints shall be installed, made up and inspected in accordance with approved printed instructions of the manufacturer.

B. The manufacturer shall test and furnish test certificates covering all pipe supplied under this contract conforming to the test requirements as specified in AWWA C110, C111, C115, and C151. Test samples shall be selected from the run of pipe proposed to be furnished for the project. Unless the Engineer elects to witness such testing, the manufacturer shall select the samples for testing. The Contractor shall advise the Engineer at least two (2) weeks in advance of the time and location of the testing.

C. Each length of pipe delivered to the job shall be inspected by the Contractor in the presence of the Engineer for dimensional tolerances and for items listed in AWWA C115 and C151. Joint tolerances shall be as specified in AWWA C111 or C115. The Contractor shall provide the Engineer with suitable templates

or caliper for checking pipe dimensions. Only lengths of pipe accepted by the Engineer and so marked may be installed in the work.

D. Ductile iron pipe shall be cut by approved power saws which will produce a clean, true cut, free from irregularities and a smooth end at right angles to the axis of the pipe. All cut ends shall be beveled. No other method of pipe cutting will be accepted.

6. Pipe Laying:

A. All pipes and fittings shall be handled carefully in loading and unloading. They shall be lifted by hoists and lowered on skidways in such a manner as to avoid shock. Derricks, ropes or other suitable equipment shall be used for lowering the pipe into the trench. Pipe and fittings shall not be dropped or dumped.

B. Each pipe and fittings shall be inspected before it is lowered into the trench. The interior of the pipe and all joint surfaces shall be thoroughly cleaned and shall thereafter be maintained clean. Care shall be taken in applying soap to facilitate joining of pipe sections. Soap shall be used sparingly. All pipe shall be laid true to line and grade with bells upstream and shall have a full, firm, even bearing. No length of pipe shall be laid until the previous length has had sufficient backfill material placed and compacted about it to secure it firmly in place to prevent any disturbance. The open ends of pipe shall be securely plugged whenever pipe laying is not in progress. Under no conditions shall pipe be laid in water, and no pipe shall be laid when trench conditions or weather are unsuitable for such work.

C. Pipe laying shall begin at a manhole or other appurtenance unless approved otherwise by the Engineer. Sufficient short lengths of pipe shall be furnished so that pipe entering and leaving manholes shall be as shown on the plans. Also, when laying vitrified clay or polyvinyl chloride pipe, a sufficient number of short lengths of pipe shall be furnished, in order that wyes may be properly placed in the main sewer line for proper alignment of the connection of the existing lateral to the wye.

D. Pipe and fittings shall be selected so that there will be as small a deviation as possible at the joints and so that inverts present a smooth surface. Pipe and fittings which do not fit together to form a tight joint will be rejected.

E. Pipe shall be laid accurately to the lines and grades shown on the plans and/or as directed by the Engineer. Line shall be set by the Contractor and the required invert grades shall be provided adjacent to the stakes. Batter boards shall be placed along the construction at a maximum of fifty (50) foot intervals. The grade line shall be maintained over at least three (3) batter boards at all times. Only a certified operator may use a laser system following the latest operational and safety instruction of the manufacturer of the laser system. The laser system shall be checked for line and grade utilizing batter boards at every set up.

F. Where an existing pipe or duct crosses the trench at an elevation which conflicts with the proposed grade for the new pipeline, either the grade for the new pipeline shall be changed or the existing pipe shall be relocated. In either case, the Contractor must receive written approval from the Engineer before continuing this phase of the project. The new pipeline shall have a clearance from the existing pipe of not less than six (6) inches. The space between the two (2) pipes shall be solidly filled with compacted sand or other material as directed by the Engineer. Before the trench is refilled, the existing pipelines shall be permanently supported as required by the agency operating such pipelines.

G. Any section of the sewer that is found defective in material, alignment, grade, joints or otherwise shall be satisfactorily corrected by the Contractor at no additional cost to the Owner.

H. The Contractor shall furnish the Engineer with a complete laying schedule.

7. Testing of Sewers:

A. General:

l) Visual inspection, air and/or water tests, infiltration and/or exfiltration tests, as applicable, shall be required generally on all sewers. The Contractor shall furnish all material and equipment necessary to conduct the sewer test(s) as outlined herein in accordance with the requirements set forth and the instructions of the Engineer and/or requirements of the sewer agency having jurisdiction.

2) All equipment and material shall be subject to the approval of the Engineer and the sewer agency having jurisdiction.

3) After the pipe trenches have been satisfactorily backfilled to full depth, the sewer line and manholes shall be flushed and cleaned. All water needed to flush the sewer system shall be furnished by the Contractor at no additional cost to the Owner.

4) All materials flushed from the sewer system shall be intercepted and received to prevent the laterals from entering any discharge facility or existing sanitary system.

5) Those portions of the sewer which cannot be pressure tested, as determined by the Engineer, will be visually inspected. The Contractor shall be responsible to dewater the sewer and bypass sewage flow in accordance with Section 9 of this specification, Televising of Sewers. The Contractor shall repair all visible leaks at no additional cost to the Owner.

B. Displacement Tests:

1) All sewer lines shall be checked to determine if any displacement of the pipe has occurred. A bright light shall be flashed between manholes. If the illuminated interior of the pipe line and/or an inspection of the interior by the Engineer shows poor alignment, displaced pipe, or any other defects as designated by the Engineerand/or sewer agency, they shall be remedied by the Contractor and the method approved by the Engineer and/or sewer agency prior to corrective measures at no additional cost to the Owner.

C. Deflection Tests:

1) A deflection test shall also be performed on polyvinyl chloride (PVC) sewer pipe after final backfill has been in place for at least thirty (30) days. Deflection of the pipe shall not exceed five percent (5%). Rigid balls or mandrels shall have a diameter equal to ninety-five percent (95%) of the inside diameter of the sewer pipe. The test shall be performed without mechanical pulling devices and in the presence of the Engineer.

D. Pressure Testing of Individual Joints:

l) General. The Contractor may perform air and/or water pressure testing of individual joints to those sections of the sewer which have lateral connections and all active flow in lieu of performing infiltration and/or exfiltration tests. The equipment and methods used for air/water pressure testing shall be approved by the Engineer and shall not utilize any untried or experimental equipment. Air/water pressure tests shall be made on each joint separately and at such other locations as the Engineer may direct.

2) Method and Equipment:

a) Test Medium. A fluid (maximum viscosity of 2 centipoise) shall be used as the test medium. Both liquid (usually water)and air are acceptable, but the test procedure is different for each.

b) Equipment. The basic equipment used shall consist of a television camera, joint testing device (such as a packer), and test monitoring equipment. The equipment shall be constructed in such a way as to provide means for introducing the test medium, under pressure, into the VOID area created by the expanded ends of the joint testing device and means for continuously measuring the actual static pressure of the test medium, at and within the VOID area only.

VOID pressure data shall be transmitted electrically from the VOID to the monitoring equipment. Example: via a TV picture of a pressure gauge located at the VOID, or via an electrical pressure transducer located at the VOID.

All test monitoring shall be above ground and in a location to allow for simultaneous and continuous observation of the television monitor and test monitoring equipment by the Owner's Representative.

3) Test Procedure. Each sewer pipe joint shall be individually tested at a test pressure equal to 1/2 psi per vertical foot of pipe depth (test pressure shall be a minimum of 5 psi and a maximum of 10 psi) in accordance with one of the following procedures:

a) Control Test.

Prior to starting the pipe joint testing phase of the work, a two-part control test shall be performed as follows:

(1) To insure the accuracy, integrity, and performance capabilities of the testing equipment, a demonstration test will be performed in a test cylinder constructed in such a manner that a minimum of two known leak sizes can be simulated. This technique will establish the test equipment performance capability in relationship to the test criteria and insure that there is no leakage of the test median from the system or other equipment defects that could affect the joint testing results. If this test cannot be performed successfully, the Contractor shall be instructed to repair or otherwise modify his equipment and reperform the test until the results are satisfactory to the Owner's Representative. This test may be required at any other time during the joint testing work if the Owner's Representative suspects the testing equipment is not functioning properly.

(2) After entering each manhole section with the test equipment, but prior to the commencement of joint testing, the test equipment shall be positioned on a section of sound sewer pipe between pipe joints, and a test performed as specified. This procedure will demonstrate the reality of the test requirement, as no joint will test in excess of the pipe capability. The barrel of the sewer pipe shall meet the requirements specified for joint tests.

b) Liquid Test Procedure

(1) The testing device shall be positioned within the line in such a manner as to straddle the pipe joint to be tested.

(2) The testing device ends (end elements, sleeves) shall be expanded so as to isolate the joint from the remainder of the line and create a VOID area between the testing device and the pipe joint. The ends of the testing device shall be expanded against the pipe with sufficient pressure to contain a minimum of 10 psi within the VOID without leakage past the expanded ends.

(3) Water or an equivalent liquid shall then be introduced into the VOID area until a pressure equal to or greater than the required test pressure is observed with the VOID pressure monitoring equipment. If the required test pressure cannot be developed (due to joint leakage), the joint will have failed the test and shall be repaired by approved means.

(4) The flow rate of the test liquid shall then be regulated to a rate at which the VOID pressure is observed to be the required test pressure. Reading of the test liquid flow meter shall then be taken. If the flow rate exceeds 1/4 gallon per minute (due to joint leakage), the joint will have failed the test and shall be repaired and retested.

c) Air Test Procedure:

(1) The testing device shall be positioned within the line in such a manner as to straddle the pipe joint to be tested.

(2) The testing device ends (end elements, sleeves), shall be expanded so as to isolate the joint from the remainder of the line and create a VOID area between the testing device and the pipe joint. The ends of the testing device shall be expanded against the pipe with sufficient pressure to contain a minimum of 10 psi within the VOID without leakage past the expanded ends.

(3) Air shall then be introduced into the VOID area until a pressure equal to or greater than the required test pressure is observed with the VOID pressure monitoring equipment. If the required test pressure cannot be developed (due to joint leakage), the joint will have failed the test and shall be repaired by approved means.

(4) After the VOID pressure is observed to be equal to or greater than the required test pressure, the air flow shall be stopped. If the VOID pressure decays by more than 2 psi within 15 seconds (due to joint leakage), the joint will have failed the test and shall be repaired and retested.

E. Infiltration and Exfiltration Tests:

1) General:

a) After the pipe has been laid and upon satisfactory completion of the displacement inspections, all sewers laid, including manholes, sewer mains and laterals, shall be tested for infiltration, exfiltration or both in sections as directed by the Engineer and/or sewer agency and shall satisfactorily meet the test requirements specified herein prior to final acceptance of the work.

b) All tests shall be conducted in a manner to minimize interference with progress of the work and such tests shall be made prior to making connections with other sewers, pipes or drains unless otherwise permitted by the sewer agency having jurisdiction. All stubs and house connections shall be adequately plugged to resist the hydrostatic test pressure.

c) The Engineer and/or sewer agency will designate the tests to be performed on the basis of the ground water elevations and other physical conditions at the time tests are to be performed. Ground water elevations at the time of testing shall be determined by means of test holes made by the Contractor at intervals of approximately one thousand (1,000) feet or less along the sewer line in locations approved by the Engineer or by means of standpipes placed in manholes designated by the Engineer and/or sewer agency.

2) Procedure:

a) The Contractor shall notify the Engineer when the work is ready for testing and tests shall be conducted as soon as possible thereafter, under the direction of the Engineer. Personnel for reading meters, gauges or other measuring devices will be furnished by the Engineer. All other labor, equipment, water and materials, including meters and gauges shall be furnished by the Contractor at his own expense to perform the required tests. The maximum length of pipe to be tested shall not exceed 1,000 feet. The infiltration and exfiltration tests shall extend over a period of not less than

twenty-four (24) hours. The initial reading shall be taken at the start of the working day and followed by not less than seven (7) consecutive hourly readings. An additional reading shall be made twenty-four (24) hours after the initial reading.

b) A reasonably uniform rate of flow must be obtained during the testing period in order for the test to be considered valid. If the measured infiltration or exfiltration exceeds the specified rate, the necessary repairs and replacements shall immediately be made to pipe and manholes and repairs and tests repeated as many times as necessary until the requirements hereinbefore specified have been met, all at no additional cost to the Owner. Depending on field conditions, the Engineer shall order either an infiltration and/or exfiltration test.

3) Infiltration Tests:

a) The infiltration tests shall only be used when the depth of ground water is not less than two (2) feet above the top of pipe. Infiltration shall neither exceed a rate of 100 gallons for sanitary sewers, nor 500 gallons for storm sewers, per inch of diameter per day per mile of pipe when the depth of water above the pipe is within one (l) foot of the highest recorded water table as indicated on the pre-bid boring logs or encountered during construction, whichever is higher.

b) If the depth of ground water is not within one (l) foot of the highest recorded water table and infiltration exceeds fifty (50) percent of the above, then an exfiltration test will be mandatory. Infiltration through joints shall be measured by using a watertight weir or any other approved device for volumetric measurement, installed at the lower end of the section under test.

4) Exfiltration Tests:

a) The maximum permissible exfiltration rate shall be 100 gallons for sanitary sewers, and 500 gallons for storm sewers, per inch of diameter per day per mile of pipe under a differential head of not less than four (4) feet nor more than ten (10) feet above the top of the pipe or above groundwater, whichever is higher, at the highest point of the pipe under test, and then measuring the loss of water from the sewer. All water needed to run the exfiltration test(s) shall be furnished by the Contractor at no additional cost to the Owner.

5) Combined sewers shall meet the requirements of sanitary sewers.

8. Maintenance of Sewage Flows:

A. Sewage flows from upstream sewers and laterals shall be maintained without interruption during the life of the Contract. Any method for bypassing sewage flows shall be submitted in writing to the Engineer or approval prior to the start of bypassing. Included in the submittal shall be the following:

l) A sketch and description indicating:

a) The method for any plugging of sewers and location of same.

b) Pumps and bypass piping, if used - location, size and pump capacity.

2) Method of handling flows after working hours.

3) Method of testing newly installed sewer.

4) Any alternative or back-up measures for handling sewage flows.

B. In the event that the Contractor's temporary modification to the sewer system, or service laterals for maintenance of sewer service, results in any damage to public or private property, the Contractor shall repair the damage including cleaning of basements where sewage has backed up, as directed by the Engineer, at the Contractor's expense.

9. Television of Sewers:

A. Work Included. This section covers the dewatering, television inspection, inspection report and video cassettes of new sewer line being installed. Televising shall be limited to all pipe installations greater than thirty continuous feet.

B. Dewatering

l) Dewatering shall be accomplished by the Contractor when sewer line flows are above the minimum requirements or inspection of the complete periphery of the pipe is necessary to effectively conduct inspection operations. Dewatering techniques may not include mopping, or any other which will result in a completely dry pipe.

2) Dewatering shall be accomplished by inserting a sewer line plug into the line at a manhole upstream from the section to be inspected. The plug shall be so designed that the sewer flow can be released quickly to prevent any possible damage to public or private property.

3) The Contractor will furnish all materials, labor, machinery and services necessary for the by-pass pumping of sanitary sewage when necessary and as directed by the Engineer to effectively conduct the television inspection. By-passed sanitary sewage will not be discharged to open ground, street or curb areas, but will usually be discharged into an acceptable sanitary sewer manhole.

C. Television Inspection:

l) The television camera used for inspection shall be one specifically designed and constructed for sewer inspection. Lighting for the camera shall be suitable to allow a clear picture for the entire periphery of the pipe. The camera shall be operative in 100% humidity conditions. Picture quality and definition shall be to the complete satisfaction of the Engineer. The camera shall be capable of being moved through the sewer line in either direction at a uniform, slow rate of about one-half foot per second.

2) During the actual television inspection, a log shall be maintained by the Contractor's Operating Technician. This log will be a complete record of all structural defects, service connections, abnormal conditions and other pertinent data observed, together with the footage distance of each. This log will be maintained on forms to be supplied by the Contractor.

3) A VHS video cassette shall also be recorded such that the TV inspection may be played back at a later date. This cassette shall have an audio channel which will be used by the Operating Technician to record footage distance to each item noted in the log. The video cassettes and log will become the property of the Owner. The video cassettes shall be furnished on VHS style cassettes and shall be compatible for playback in a VHS video cassette record player.

The Contractor shall submit the video cassettes and logs to the Engineer on a daily basis. Tapes must be of reasonable video clarity in order to be acceptable to the Engineer.

4) The Contractor shall furnish, on loan, all electronic equipment necessary to play back the VHS video cassette. The equipment shall be made available at the Engineer's office. Play back speed shall not be more than normal speed and the equipment shall be capable of displaying a picture with the tape stopped (Pause Position).

METHOD OF MEASUREMENT

The quantity paid for will be the total horizontal length in linear feet of sewer pipe as measured parallel with the centerline of the installed sewer from inside face to inside face of manhole or structure bases. The payment length shall include the length of wye branch or tee branch sections. The payment length shall not include the length of R.C.P. prefabricated tee sections.

BASIS OF PAYMENT

1. General. The unit price bid per linear foot shall include the cost of furnishing all labor, materials, and equipment necessary to complete the work. Excavation, bedding, backfill and surface restoration will be paid for separately under their appropriate item.

2. Progress Payment:

A. Seventy-five (75%) percent of the unit price bid for pipe installed, complete in place, will be paid upon acceptable installation of the pipe before successful completion of the required field tests.

B. Ninety-five (95%) percent of the unit price bid for pipe installed will be paid upon satisfactory completion of the required field tests.

C. The full unit price bid for pipe installed will be paid upon successful completion of the required television or photographic inspection.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C603.0412XX	Vitrified Clay Pipe, Extra Strength, XX" Diameter	Linear Foot
C603.6003XX	Reinforced Concrete Pipe, Class III, Steel Ring Joints, XX" Diameter	Linear Foot
C603.6004XX	Reinforced Concrete Pipe, Class III, Rubber Gasket Joints, XX" Diameter	Linear Foot
C603.6103XX	Reinforced Concrete Pipe, Class IV, Steel Ring Joints, XX" Diameter	Linear Foot
C603.6104XX	Reinforced Concrete Pipe, Class IV, Rubber Gasket Joints, XX" Diameter	Linear Foot
C603.6203XX	Reinforced Concrete Pipe, Class V, Steel Ring Joints, XX" Diameter	Linear Foot
C603.6204XX	Reinforced Concrete Pipe, Class V, Rubber Gasket Joints, XX" Diameter	Linear Foot
C603.9581XX	Ductile Iron Pipe, Class 52, XX" Diameter	Linear Foot
C603.9908XX	Polyvinyl Chloride Pipe, SDR 35, XX" Diameter	Linear Foot
C603.9909XX	Polyvinyl Chloride Pipe, SDR 26, XX" Diameter	Linear Foot
C603.9910XX	Polyvinyl Chloride Pipe, SDR 21, XX" Diameter	Linear Foot

LATERAL PIPE

DESCRIPTION

This work shall consist of the construction or reconstruction of pipe laterals and pipe lateral risers in accordance with these specifications and as shown on the plans.

MATERIALS

1. Polyvinyl Chloride Pipe:

Polyvinyl chloride pipe and fittings shall have bell and spigot joints with flexible elastomeric gaskets. SDR 21 pipe and fittings shall conform to ASTM D2241, with joints conforming to ASTM D3139 and F477.

2. Cast Iron Soil Pipe:

Cast iron soil pipe shall be extra heavy conforming to ASTM A74. Joints shall be push-on neoprene gaskets conforming to ASTM C564.

CONSTRUCTION DETAILS

1. General:

A. All joints shall be installed, made up and inspected in accordance with approved printed instructions of the manufacturer. Joint tolerances shall be specified in ASTM C564 for cast iron soil pipe, and in ASTM D3139 and F477 for polyvinyl chloride pipe.

B. The manufacturer shall test and furnish test certificates covering all pipe supplied under this contract conforming to the test requirements as specified in ASTM A74 for cast iron soil pipe, and in ASTM D2241 for polyvinyl chloride pipe.

C. All pipe shall be cut by approved power saws which will produce a clean, true cut, free from irregularities and a smooth end at right angles to the axis of the pipe. All cut ends shall be beveled. No other method of pipe cutting will be accepted.

2. Pipe Laying:

A. All pipes and fittings shall be handled carefully in loading and unloading. They shall be lifted by hoists and lowered on skidways in such a manner as to avoid shock. Derricks, ropes or other suitable equipment shall be used for lowering the pipe into the trench. Pipe and fittings shall not be dropped or dumped.

B. Each pipe and fitting shall be inspected before it is lowered into the trench. The interior of the pipe and all joint surfaces shall be thoroughly cleaned and shall thereafter be maintained clean. Care shall be taken in applying soap to facilitate joining of pipe sections. Soap shall be used sparingly. All pipe shall be laid true to line and grade with bells upstream and shall have a full, firm, even bearing. No length of pipe shall be laid until the previous length has had sufficient backfill material placed and compacted about it to secure it firmly in place to prevent any disturbance. The open ends of pipe shall be securely plugged whenever pipe laying is not in progress. Under no conditions shall pipe be laid in water, and no pipe shall be laid when trench conditions or weather are unsuitable for such work. Pipe and fittings shall be selected so that there will be as small a deviation as possible at the joints and so that inverts present a smooth surface. Pipe and fittings which do not fit together to form a tight joint will be rejected.

C. Where an existing pipe or duct crosses the trench at an elevation which conflicts with the proposed grade for the new lateral, either the grade for the new lateral shall be changed or the existing pipe shall be relocated. In either case, the Contractor must receive written approval from the Engineer before continuing this phase of the project. The new lateral shall have a clearance from the existing pipe of not less than six (6) inches. The space between the two (2) pipes shall be solidly filled with compacted sand or other material as directed

by the Engineer. Before the trench is refilled, the existing pipelines shall be permanently supported as required by the agency operating such pipelines.

D. Any section of the lateral that is found defective in material, alignment, grade, joints or otherwise shall be satisfactorily corrected by the Contractor at no additional cost to the Owner.

E. Where new laterals are to be constructed, they shall be installed as shown on the plans and/or as directed by the Engineer to a permanent easement line, right-of-way line or property line and tested along with the main sewer. The ends of these laterals shall be plugged with a water tight plug to prevent infiltration and exfiltration.

F. Where laterals currently exist, the Contractor shall reconnect the existing lateral to the new sewer. The connection fitting between new and existing laterals shall be a coupling conforming to ASTM C425, using an elastomeric sleeve, corrosion-resistant shear collar and tension bands and tightening mechanism, and it shall be as close as possible to the new sewer. The Contractor shall dye test existing laterals when necessary as directed by the Engineer.

G. Lateral markers shall be placed at the ends of all plugged sewer laterals. The marker shall consist of a twelve (12) foot long, 2 inch x 4 inch timber placed at the invert of the lateral end to mark its location and depth. The top of the marker shall have the word "Sanitary" for sanitary laterals and "Storm" for storm laterals stenciled on it with green paint. The letters shall be one and one-half (1-1/2) inches in size. If the end of the lateral is more than twelve (12) feet deep, the length of the 2 inch x 4 inch timber marker shall be increased by four (4) foot increments until at least two (2) feet of the marker extends above finished surface grade. If the marker is more than twelve (12) feet long, the exact length of the marker shall be painted on the portion of the marker which extends above finished surface grade. The ends of all plugged laterals shall be referenced with direct physical ties. The references and invert elevations of the lateral ends shall be noted on the as-built drawings.

METHOD OF MEASUREMENT

1. The quantity paid for lateral pipe will be the total length measured parallel with the centerline of the installed lateral pipe from the end of the wye branch, tee branch, tee saddle or lateral riser, to the end of the lateral pipe. If a portion of an existing lateral requires replacement beyond the payment limits indicated in the item "Connect Existing Lateral to New Sewer", then the quantity paid for will be measured from a point five feet beyond the main sewer horizontal payment limits for trench excavation or trench excavation solid rock to the connection point between the existing and new lateral pipe. Payment shall include installation of the bends, pipe, watertight plug and lateral marker as required.

2. The quantity paid for lateral riser pipe will be the total length measured parallel with the centerline of the installed riser pipe from the end of the tee branch or tee saddle to the end of its last bend. Payment shall include installation of the bends, pipe, watertight plug and lateral marker as required.

BASIS OF PAYMENT

The unit price bid per linear foot shall include the cost of furnishing all labor, materials, and equipment necessary to complete the work. Excavation, bedding, backfill and surface restoration will be paid for separately under their appropriate items.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C603.945101	Cast Iron Soil Pipe Lateral, Extra Heavy, 4" Diameter to 6" Diameter	Linear Foot

ITEM NO.	ITEM	PAY UNIT
C603.9451XX	Cast Iron Soil Pipe Lateral, Extra Heavy, XX" Diameter	Linear Foot
C603.945201	Cast Iron Soil Pipe Lateral Riser, Extra Heavy, 4" Diameter to 6" Diameter	Linear Foot
C603.9452XX	Cast Iron Soil Pipe Lateral Riser Extra Heavy, XX" Diameter	Linear Foot
C603.992101	Polyvinyl Chloride Pipe Lateral, SDR 21, 4" Diameter to 6" Diameter	Linear Foot
C603.9921XX	Polyvinyl Chloride Pipe Lateral, SDR 21, XX" Diameter	Linear Foot
C603.992201	Polyvinyl Chloride Pipe Lateral Riser, SDR 21, 4" Diameter to 6" Diameter	Linear Foot
C603.9922XX	Polyvinyl Chloride Pipe Lateral Riser, SDR 21, XX" Diameter	Linear Foot

MANHOLES AND JUNCTION CHAMBERS

DESCRIPTION

This work shall consist of the construction of manholes and junction chambers as shown on the plans and in accordance with these specifications.

MATERIALS

1. Brick:

Brick shall be first quality, sound, hard-burned common brick conforming to ASTM C32, manhole brick, Grade MS (for grade adjustment) and sewer brick, Grade SS (for inverts and benches). Brick shall be culled of all irregulars and unsound or damaged brick before laying.

2. Mortar:

Portland Cement mortar conforming to ASTM C270, Type M, Mortar for Unit Masonry.

3. Concrete and Reinforcing Steel:

Concrete and reinforcing steel shall conform to the requirements of NYSDOT Subsection 604-2.

4. Castings for Frames, Grates, Covers and Shear Gates:

Castings for frames, grates, covers and shear gates shall be true to pattern in form and dimensions without sharp unfilleted angles or corners; and shall be free from pouring faults, sponginess, cracks, blow holes and other defects in locations affecting their strength and value for the service intended. All old castings and steel frames and grates being replaced in this contract shall become the property of the Rochester Pure Waters District and they shall be delivered to Monroe County Facilities, 444 E. Henrietta Road, Rochester, New York at no extra cost to the Owner.

A. Cast Iron Castings:

Cast Iron castings shall conform to the requirements of ASTM A48 Class 30B. All castings shall be coated with a coal tar pitch varnish which will result in a smooth, tough coating that is not tacky or brittle.

B. Manufacture:

Castings shall be Syracuse Castings Sales corporation Number 1032 Neenah Number R-1726-A for Standard manhole Castings; or Neenah No. R-1755-FOR or Syracuse Castings Sales Corporation Number 1539-A for water tight manhole castings. Catalog numbers indicated are given to show the required type and configuration only. Castings shall be the product of a recognized manufacturer with satisfactory experience in the production of castings of the type indicated and specified.

C. Frames and Covers:

Frames and covers shall be accurately made and covers shall fit in any position without rocking. Horizontal and vertical fitting surfaces shall be milled to a true and even surface to insure uniform bearing. Units shall be interchangeable. Shop drawings shall be submitted for approval together with an affidavit from the manufacturer certifying compliance with the material specifications. All manhole covers shall have concealed or blind pick holes.

D. Manhole Cover Imprint:

The word "SANITARY" or "STORM", and the letters "MCPW" in letters not less than two inches (2") high shall be stamped or cast into all sanitary and storm manhole covers so as to be plainly visible.

E. Manhole Steps:

Manhole steps shall be Neenah R-1981-l or N.J. Aluminum F14-2-B or approved equal. All steps shall be cast into the walls of the manholes so as to form a continuous ladder with a distance of 12" between steps. The embedded portion of the step shall be coated with a 15 mil coat of coal tar coating.

CONSTRUCTION DETAILS

1. General:

It is the intent of this specification to secure soundly constructed, watertight manholes and junction chambers constructed in accordance with the plans. Foundations shall not be placed upon frozen or muddy subgrades. Precast concrete sections shall be the product of a recognized manufacturer experienced in the production of precast manhole sections of the type indicated and specified. Complete shop drawings of manholes and junction chambers and complete data on the gaskets proposed for use at the joints between precast sections, shall be submitted for the approval of the Engineer as specified in the General Conditions.

2. The design and construction of all reinforced concrete structures shall conform with the American Concrete Institute standard 318-77 titled "Building Code Requirements for Reinforced Concrete", unless otherwise indicated on the drawings or specified herein.

3. Cast-in-Place Manhole Bases and Chambers.

Cast-in-place bases and chambers shall be constructed of reinforced concrete as shown on the plans. Concrete manhole foundations shall be placed over a surrounding 4 mil polyethylene sheet.

4. Precast Manhole Bases and Chambers.

Round precast concrete manhole bases shall conform to the requirements of ASTM C478. Other precast bases and chambers shall be constructed of reinforced concrete as shown on the plans. The bases shall have an approved positive entry seal for main sewer connections except when steel ring joint R.C.P. is used. When steel ring joint R.C.P. is used the bases shall have steel bell wall fittings compatible with the main sewer joints cast in the side walls. Bedding for precast manhole bases shall be as shown on the plans.

5. Precast Manhole Riser and Top Slabs.

Precast concrete, riser and transition sections, top slabs and grade rings shall conform to the requirements of ASTM C478. Joints between riser section shall be provided with round rubber gaskets conforming to the requirements of ASTM C443. Top slabs shall be designed to support an HS 20-44 vehicular loading unless otherwise shown on the plans.

6. Lifting Holes.

Lifting holes shall have a maximum depth of one-half of the riser wall thickness and shall be filled with Mainstay or an epoxy mortar after the manhole is set in place.

7. Installation:

A. The top of the slab or walls of the cast-in-place concrete chamber or base, and precast bases shall be formed to fit the lower end of the first precast concrete riser. The shaping shall be done with an approved cast iron pallet accurately shaped to the required round rubber gasket which, when assembled, shall be selfcentering and make a uniform watertight joint.

B. Joints between precast manhole sections shall be provided with a round rubber gasket conforming to the requirements of ASTM C443 when assembled, shall be self-centering and make a uniform watertight joint. The gasket spaces between the bell and spigot shall be so shaped as to provide either groves or shoulders that will prevent the gasket from disengaging from its compression surfaces or being blown out by hydrostatic pressure. A coating of Pioneer 301 thermo setting joint compound manufactured by the Daubert Chemical Company, or approved equal, shall be applied to the outside of all manhole joints.

C. Cast-in-place bases shall have pipe stubs integrally cast into the side walls at the time the concrete is poured except when the main sewer is R.C.P. with steel ring joints. When the main sewer is R.C.P. with steel ring joints, steel bell wall fittings shall be cast in the side walls to receive the pipe ends. Bell wall fittings shall be adequately supported with timber or steel struts or by the pipe stub spigot during concrete placing to maintain them true and round. Continuous 6" P.V.C. waterstops shall be formed into all construction joints as indicated on the plans and/or as ordered by the Engineer. Waterstops shall be Greenstreak type 705 P.V.C. or approved equal.

D. The bell at the upper end of the riser sections and cast-in-place concrete base shall be wiped free of all dirt and grit, and sparingly soaped to receive the succeeding section. Prior to snapping the gasket onto the spigot groove of the riser section, the gasket shall be wiped clean and soaped. Care shall be taken to keep soap off of concrete so as to insure proper bonding of the coating materials. A screw driver or similar tool shall be inserted beneath the gasket and run around the pipe to insure even seating. The riser section with gasket in place shall then be lowered into the bell of the previously placed section taking care that no dirt is present in the joint or on the gasket.

E. All joints shall be installed, made up and inspected in accordance with approved printed instructions of the manufacturer.

F. Dampproofing:

Dampproofing materials shall be delivered to the site in the manufacturer's sealed containers, clearly marked with name of the product. Application methods and temperature shall be in accordance with the written recommendations of the manufacturer and as approved by the Engineer.

Two coats of exterior coating shall be Bitumastic Super Service Black manufactured by Koppers Company, Inc., or approved equal. The coatings shall be applied according to the manufacturer's latest instructions.

All benches, concrete channel inverts and interior walls of the manhole base up to the top of the highest pipe shall be coated with two coats of Sikagard 62 manufactured by Sika Corporation or Duralkote 312 as manufactured by Dural International Corporation or Engineer approved equal. The material shall be applied according to the manufacturer's instructions. Interior surfaces above the top of the highest pipe shall be coated with one of the materials specified for exterior coating in the above paragraph.

G. Invert Channels and Benches. Invert channels and benches shall be smooth and semicircular in shape conforming to the inside of the adjacent sewer section. Changes in direction of flow shall be made with smooth curves of a large radius as the size of the manhole will permit and the pipes shall stop at the inside face of the manhole where such changes in direction occur. Invert channels and benches shall be constructed of formed concrete.

H. Completed manholes shall be subject to an infiltration or exfiltration test. These tests shall meet the requirements listed under "Testing of Sewers". Manholes which do not meet the test requirements shall be repaired by the Contractor at his expense.

8. Length of Sections

Unless otherwise indicated, precast manhole sections shall be of such lengths as will permit the setting of the manhole frame to the required elevation on top of the upper section. The top riser section shall be four (4) foot maximum in length. The manhole frame shall be brought to finish grade with a minimum of two courses of brick and it shall be firmly set in a bed of mortar not less than one-half (1/2) inch thick.

METHOD OF MEASUREMENT

1. Manholes. The quantity to be paid for under these items shall be the number of manholes completed in accordance with the plans and specifications. Depth of manholes will be measured from the invert elevation of the downstream pipe to the manhole cover top elevation.

2. Additional Depth of Manholes. The quantity to be paid for under these items will be the number of linear feet of depth measured to the nearest tenth of a foot. This quantity will be for additional manhole riser sections when the depth of manhole exceeds 6.0' measured as specified in No. 1 above.

3. Junction Chamber. Payment for junction chambers will be made on additional lump sum basis.

BASIS OF PAYMENT

1. General. The unit price bid or lump sum price bid shall include all labor, equipment, and materials including frames and covers necessary to complete the work as specified. Excavation, backfill and surface restoration will be paid for separately under their appropriate items .

2. Progress Payment:

A. Seventy-five (75) percent of the unit price bid for structures installed, complete in place, will be paid upon acceptable installation of the structures before successful completion of the required field tests.

B. The full unit price bid for structures installed will be paid upon successful completion of the required field tests and substantial completion of all other work items including restoration.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C604.044801	Manhole, 4' Diameter, Precast Base, up to 6.0' Deep	Each
C604.044802	Manhole, 4' Diameter, Cast-in-Place Base, up to 6.0' Deep	Each
C604.044803	Additional Depth of 4' Diameter Manhole	Linear Foot
C604.046001	Manhole, 5' Diameter, Precast Base, up to 6.0' Deep	Each
C604.046002	Manhole, 5' Diameter, Cast-in-Place Base, up to 6.0' Deep	Each
C604.046003	Additional Depth of 5' Diameter Manhole	Linear Foot
C604.0499XX	Junction Chamber No. X	Lump Sum

CONNECTIONS

DESCRIPTION

This work shall consist of lateral connections to existing or new sewers, connecting new sewers to existing sewers or manholes, connecting new manholes to existing sewers and connecting new receiving basins to existing laterals as shown on the plans or as ordered by the Engineer.

MATERIALS

Elastomeric sleeve connections shall conform to ASTM C425 with corrosion resistant shear collar, tension bands and additional tightening mechanism. Other materials shall be as shown on the plans.

CONSTRUCTION DETAILS

1. Connections to new polyvinyl chloride pipe or vitrified clay pipe main sewers shall be made with wye branch pipe sections, except for riser type connections where tee branch pipe sections shall be used. Connections to existing vitrified clay pipe or polyvinyl chloride pipe main sewers shall be made with tee saddle hubs, or new wye branch or tee branch pipe sections installed in the main sewer as shown on the plans and/or as directed by the Engineer. The Contractor shall furnish bends as necessary. Tee saddle hub connections shall be cored as specified in the following section for reinforced concrete pipe connections.

2. Connection to existing or new reinforced concrete pipe main sewers shall be made by coring an opening in the main sewer to receive additional tee saddle hub which shall be mortared in place using additional 100% solids epoxy mortar such as Sikadur 33 or an approved equal. The use of impact devices to make the opening will not be permitted. Care shall be taken to insure that neither the lateral or the epoxy mortar shall protrude into the inner circumference of the main sewer, and all debris which may accumulate in the main sewer while making the connection shall be completely removed. The Contractor shall furnish bends as necessary.

3. Connections between new sewers and existing sewers or manholes or between receiving basins and laterals, shall conform to details shown on the plans, or shall be made with elastomeric sleeves. New manholes shall be connected to existing sewers with elastomeric sleeves or concrete collars and this work shall include new lengths of sewer pipe as needed to reach the connection point.

METHOD OF MEASUREMENT

1. Connect Existing Lateral to New Sewer. The quantity paid for will be the number of existing laterals connected to new sewers. Payment shall include installation of the wye branch, tee branch or tee saddle, the bends, lateral pipe and elastomeric sleeve to connect existing lateral pipe to new lateral pipe. This item shall include new lateral pipe from the main sewer to additional point five feet beyond the main sewer side payment limits for "Trench Excavation" or "Trench Excavation-Solid Rock".

2. Connect New Lateral to Existing or New Sewer. The quantity paid for will be the number of new laterals connected to existing or new sewers. Payment shall include installation of the wye branch, tee branch or tee saddle.

3. All Other Connections. The quantity to be paid for under these items shall be the number of connections completed in accordance with the plans and specifications.

BASIS OF PAYMENT

The unit price bid shall include the cost of all labor, materials and equipment necessary to complete the work as specified. Excavation, backfill and surface restoration will be paid for separately under their appropriate items.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C604.076001	Connect Existing 4" or 6" Lateral to New Sewer	Each
C604.0760XX	Connect Existing XX" Lateral to New Sewer	Each
C604.076103	Connect New 4" or 6" Lateral to Existing or New Sewer	Each
C604.0761XX	Connect New XX" Lateral to Existing or New Sewer	Each
C604.0762XX	Connect New XX" Sewer to Existing Manhole	Each
C604.0763XX	Connect New XX" Sewer to Existing Stone Box Sewer	Each
C604.0764XX	Connect New XX" Sewer to Existing Sewer with Concrete Collar	Each
C604.0765XX	Connect New XX" Sewer to Existing Sewer with Elastomeric Sleeve	Each
C604.0766XX	Connect New Manhole to Existing XX" Sewer	Each
C604.0767XX	Connect New Receiving Basin to Existing Lateral	Each
C604.0768XX	Connect New Manhole to Existing or New XX" Sewer with Outside Drop Connection	Each
C604.0769XX	Connect Existing Manhole to Existing or New XX" Sewer with Outside Drop Connection	Each

MONROE COUNTY TRAFFIC ENGINEERING STANDARD SPECIFICATIONS

SPECIFICATION LISTING

GENERAL

The following Monroe County Traffic Engineering Standard Items are acceptable for use as City of Rochester Standard Specifications. The work shall conform to the requirements of the appropriate Monroe County Traffic Engineering Specification for these items:

ITEM NO.	ITEM	PAY UNIT
C206.0315	Traffic Signal Conduit Excavation and Restoration in Asphalt Concrete	LF
C206.0316	Traffic Signal Conduit Excavation and Restoration in Portland Cement Concrete	LF
C206.0317	Traffic Signal Conduit Excavation and Restoration in Composite Pavement	LF
C206.0318	Traffic Signal Conduit Excavation and Restoration in Concrete Sidewalks and Driveways	LF
C206.0319	Traffic Signal Conduit Excavation and Restoration in Asphalt Sidewalks and Driveways	LF
C206.0320	Traffic Signal Conduit Excavation and Restoration in Grass and Unpaved Areas	LF
C676.7006	Mast Arm (Street Light) 6' Length	EA
C676.7008	Mast Arm (Street Light) 8' Length	EA
C676.7010	Mast Arm (Street Light) 10' Length	EA
C676.7012	Mast Arm (Street Light) 12' Length	EA
C676.7014	Mast Arm (Street Light) 14' Length	EA
C676.7016	Mast Arm (Street Light) 16' Length	EA
C680.9909	Remove Traffic Signal Pullboxes	EA
C685.03	Sign Post (10')	EA
C685.04	Sign Post (12')	EA
C685.05	Sign Sleeve	EA
C685.06	Sign Post and Sleeve (10')	EA
C685.07	Sign Post and Sleeve (12')	EA
C685.08	Adjust Frames and Covers (Pull Boxes)	EA
C685.3101	Traffic Sign Size 8" x 24"	EA
C685.3102	Traffic Sign Size 8" x 30"	EA
C685.3103	Traffic Sign Size 8" x 36"	EA
C685.3201	Traffic Sign Size 12" x 18"	EA
C685.3202	Traffic Sign Size 12" x 24"	EA
C685.3203	Traffic Sign Size 12" x 30"	EA
C685.3204	Traffic Sign Size 12" x 36"	EA

ITEM NO.	ITEM	PAY UNIT
C685.3301	Traffic Sign Size 18" x 18"	EA
C685.3302	Traffic Sign Size 18" x 24"	EA
C685.3303	Traffic Sign Size 18" x 30"	EA
C685.3304	Traffic Sign Size 18" x 36"	EA
C685.3401	Traffic Sign Size 24" x 24"	EA
C685.3402	Traffic Sign Size 24" x 30"	EA
C685.3403	Traffic Sign Size 24" x 36"	EA
C685.3501	Traffic Sign Size 30" x 30"	EA
C685.3502	Traffic Sign Size 30" x 36"	EA
C685.3601	Traffic Sign Size 36" x 36"	EA
C685.3602	Traffic Sign Size 36" x 48"	EA
C685.3701	Traffic Sign Size 30" Triangle	EA
C685.3702	Traffic Sign Size 36" Triangle	EA
C685.3801	Traffic Sign Size 30" 5 Sides	EA
C685.3901	Traffic Sign Size 24" Octagon	EA
C685.3902	Traffic Sign Size 30" Octagon	EA
C685.3903	Traffic Sign Size 36" Octagon	EA
C685.3904	Traffic Sign Size 30" Circle	EA
C685.3905	Traffic Sign Size 36" Circle	EA
C685.41	Removal of Signs - Size A (0 to 10 S.F.)	EA
C685.42	Removal of Signs - Size B (11 to 20 S.F.)	EA
C685.43	Removal of Signs - Size D (41 to 100 S.F.)	EA
C685.44	Removal of Signs - Size C (21 to 40 S.F.)	EA
C685.45	Removal of Signs - Size E (Over 100 S.F.)	EA
C685.46	Relocating Signs - Size A (0 to 10 S.F.)	EA
C685.47	Relocating Signs - Size B (11 to 20 S.F.)	EA
C685.48	Relocating Signs - Size C (21 to 40 S.F.)	EA
C685.49	Relocating Signs - Size D (41 to 100 S.F.)	EA
C685.50	Relocating Signs - Size E (Over 100 S.F.)	EA
C686.1611	Maintain Traffic Signal Equipment	INTMO
C686.5099	Concrete Base Removal (Pole or Controller)	EA
C686.71	Shielded Lead-in Cable	LF
C686.72	Inductance Loop Installation and Sealing	LF
C686.7201	Inductance Loop Wire	LF
C686.77	Modify Traffic Signal Equipment	LS
C686.79	Signal Equipment Removal	LS
C686.8026	Pedestrian Push Button with Sign	EA
C686.820030	Mast Arm Traffic Signal Pole Anchor Base (22')	EA
C686.820031	Mast Arm Traffic Signal Pole Combination Anchor Base (30')	EA
C686.830000	Concrete Pole Base Extension	EA

ITEM NO.	ITEM	PAY UNIT
C686.850010	Mast Arm Traffic Signal, 10' Length	EA
C686.850012	Mast Arm Traffic Signal, 12' Length	EA
C686.850014	Mast Arm Traffic Signal, 14' Length	EA
C686.850016	Mast Arm Traffic Signal, 16' Length	EA
C686.850018	Mast Arm Traffic Signal, 18' Length	EA
C686.850020	Mast Arm Traffic Signal, 20' Length	EA
C686.850022	Mast Arm Traffic Signal, 22' Length	EA
C686.850024	Mast Arm Traffic Signal, 24' Length	EA
C686.850026	Mast Arm Traffic Signal, 26' Length	EA
C686.850028	Mast Arm Traffic Signal, 28' Length	EA
C686.850030	Mast Arm Traffic Signal, 30' Length	EA
C686.850032	Mast Arm Traffic Signal, 32' Length	EA
C686.850034	Mast Arm Traffic Signal, 34' Length	EA
C686.850036	Mast Arm Traffic Signal, 36' Length	EA
C686.850038	Mast Arm Traffic Signal, 38' Length	EA
C686.850040	Mast Arm Traffic Signal, 40' Length	EA
C686.850042	Mast Arm Traffic Signal, 42' Length	EA
C686.9916	Coaxial Cable Installation	LF
C686.9917	Removal of Coaxial Cable	LF
C686.9941	Galvanized Steel Pedestrian Signal Pole	EA
C686.994401	Pullbox (24")	EA
C686.994402	Pullbox (30")	EA
C686.9950	Milling Existing Pavement for Loops	SY
C686.9955	Modify Traffic Signal Cable	EA

TRAFFIC SIGNAL CONDUIT EXCAVATION AND RESTORATION

DESCRIPTION: This work shall consist of the excavation and necessary backfill and restoration required for traffic signal conduits.

MATERIALS: Materials for the restoration of top surfaces shall be as indicated on the plans and as approved by the Engineer.

CONSTRUCTION DETAILS: The requirements of NYSDOT Subsection 206-3 shall apply with the following additions:

> When the Contractor is required to excavate through pavement or sidewalk, he shall sawcut along neat lines as shown on the plans or as ordered by the Engineer. An approved power saw, as approved by the Engineer prior to actual use, shall be used to saw cut to the depth specified on the plans or as directed by the Engineer.

METHOD OF MEASUREMENT: NYSDOT Subsection 206-4.03 shall apply.

BASIS OF PAYMENT: The unit price bid per linear foot shall include the cost of furnishing all labor, materials and equipment necessary to complete the work including excavation, backfill, sawcutting and restoring as shown on the plans.

Any damage to existing pavement, sidewalk, curb or other facilities caused by the Contractor's operations shall be repaired by the Contractor to the satisfaction of the Engineer at no additional cost to the County or the City of Rochester.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C206.0315	Traffic Signal Conduit Excavation and Restoration in Asphalt Concrete	Linear Foot
C206.0316	Traffic Signal Conduit Excavation and Restoration in Portland Cement Concrete	Linear Foot
C206.0317	Traffic Signal Conduit Excavation and Restoration in Composite Pavement	Linear Foot
C206.0318	Traffic Signal Conduit Excavation and Restoration in Concrete Sidewalks and Driveways	Linear Foot
C206.0319	Traffic Signal Conduit Excavation and Restoration in Asphalt Sidewalks And Driveways	Linear Foot
C206.0320	Traffic Signal Conduit Excavation and Restoration in Grass and Unpaved Areas	Linear Foot

MAST ARM (STREET LIGHT)

DESCRIPTION: The Contractor shall furnish and install galvanized steel street light mast arms as shown on the plans and/or ordered by the Engineer.

MATERIAL AND METHOD: The mast arm shall be a 2" pipe truss type, up curved, for 2 bolt mounting on steel poles. The arm shall consist of an upper and lower member joined by vertical struts. The upper and lower members shall be standard steel pipe 2" I.P.S. Schedule 40. Design shall be up curved with a rise of 3' +/- 6" and spread of 10 feet to 16 feet, as indicated on the plans. Luminaire end shall be arranged for a 2" slipfitter luminaire with a 4" minimum straight section. The members at the pole end shall be equipped with 2 bolt self supporting steel hook type attachments, dimensions and drilling shall conform to the special details. Arm wiring opening shall be 2" diameter and provide a smooth raceway for internal wiring. Assembly to be hot dipped galvanized in accordance with applicable specification for zinc coatings (ASTM A123-53 & A153-53). Furnish 4 Hex. Head plated cap screws 1/2" 13 UNC x 1 1/2" with .875 O.D. plated steel 1/2" flat washers per arm.

MEASUREMENT AND PAYMENT: Payment for the galvanized street lighting mast arm will be made at the unit price bid for each unit.

The quantity payment shall be the number of units erected including bolts, brackets, and etc. in accordance with the plans and/or as directed by the Engineer.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C676.7006	Mast Arm (Street Light) 6' Length	Each
C676.7008	Mast Arm (Street Light) 8' Length	Each
C676.7010	Mast Arm (Street Light) 10' Length	Each
C676.7012	Mast Arm (Street Light) 12' Length	Each
C676.7014	Mast Arm (Street Light) 14' Length	Each
C676.7016	Mast Arm (Street Light) 16' Length	Each

REMOVE TRAFFIC SIGNAL PULLBOXES

DESCRIPTION: The Contractor shall remove pullboxes as ordered by the Engineer.

MATERIALS: None specified.

CONSTRUCTION DETAILS: The Contractor shall remove pullboxes in accordance with the specifications, plans and as ordered by the Engineer. The pullboxes shall become the property of the Contractor and be removed from the site.

The Contractor shall remove the pullboxes located in the roadway area by sawcutting the pavement 24" from the edge of the existing frame. The entire pullbox shall be removed.

The Contractor shall backfill the excavation in accordance with Section 680-3.09 to the top of the subgrade. Final restoration shall be in accordance with the plans and performed under other items in the contract.

The Contractor shall remove pullboxes located in the sidewalk by sawcutting the sidewalk 24" away from the pullbox frame or by breaking the sidewalk at score lines and removing entire sidewalk flags. The Contractor shall backfill the excavation in accordance with Section 680-3.09. Final restoration shall be in accordance with the plans.

METHOD OF MEASUREMENT: The quantity shall be measured as the number of pullboxes removed in accordance with the plans, specifications and orders of the Engineer.

BASIS OF PAYMENT: The unit price bid for each pullbox removed shall cover the cost of disposal, all labor, backfill and excavation material and equipment necessary. Payment for sawcutting, backfilling with subbase material and restoration shall be included under other items.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C680.9909	Remove Traffic Signal Pullboxes	Each

SIGN POST

5/90

DESCRIPTION: This work shall consist of furnishing and installing Sign Post and Sign Post Base in soil as shown on the Monroe County Traffic Engineering detail drawing and to the satisfaction of the Engineer.

MATERIAL: The post shall be 2" square perforated galvanized tube 10'-0" or 12'-0" long. The post base shall be 2 1/4" square perforated galvanized tube 4'-0" long.

METHOD OF MEASUREMENT: Method of measurement shall be each post and base installed in soil.

BASIS OF PAYMENT: The unit price bid for each post shall include the cost of the post, base, hardware, other materials, labor and equipment necessary to complete the job to the satisfaction of the Engineer.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C685.03	Sign Post (10')	Each
C685.04	Sign Post (12')	Each

SIGN SLEEVE

DESCRIPTION: This work shall consist of furnishing and installing Sign Post Sleeves as shown on the Monroe County Traffic Engineering detail drawing and to the satisfaction of the Engineer.

MATERIAL: The sleeve shall be 3'-0" x 3" I.D. pipe, galvanized and standard weight.

Concrete shall be NYSDOT Class A concrete.

METHOD OF MEASUREMENT: The quantity paid for will be the number of sign post sleeves installed in accordance with the Contract Documents or directed by the Engineer.

BASIS OF PAYMENT: The unit bid price for each sign post sleeve shall include the cost of pipe, concrete and other materials, labor and equipment necessary to complete the work to the satisfaction of the Engineer.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C685.05	Sign Sleeve	Each

SIGN POST AND SLEEVE

DESCRIPTION: This work shall consist of furnishing and installing Sign Post, Sign Post Base and Sleeve, as shown on the Monroe County Traffic Engineering detail drawing and to the satisfaction of the Engineer. A post shall be placed in the sleeve to prevent accidental tripping on the empty sleeve.

MATERIAL: The post shall be 2" square perforated galvanized tube 10'-0" or 12'-0" long. The post base shall be 2 1/4" square perforated galvanized tube 4'-0" long. The sleeve shall be 3'-0" x 3" I.D. pipe, galvanized and standard weight.

Concrete shall be Class A concrete.

METHOD OF MEASUREMENT: Method of Measurement shall be each sleeve, post base and post installed.

BASIS OF PAYMENT: The unit price bid for each sleeve shall include the cost of pipe, concrete, hardware, and other materials, labor and equipment necessary to complete the job to the satisfaction of the Engineer.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C685.06	Sign Post and Sleeve (10')	Each
C685.07	Sign Post and Sleeve (12')	Each

ADJUST FRAMES AND COVERS (PULL BOXES)

DESCRIPTION: Under this item the Contractor shall adjust existing pullbox frames to match new grades as ordered by the Engineer.

MATERIAL AND METHODS: The Contractor shall adjust existing pullbox to new grades. The Contractor shall repair and perform whatever work related to the pullbox as necessary in order to establish an acceptable repair and adjustment.

MEASUREMENT AND PAYMENT: Payment will be per unit bid price and shall include the cost of excavation, the adjustment, any repairs and all the material, equipment and labor necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C685.08	Adjust Frames and Covers (Pull Boxes)	Each

TRAFFIC SIGN

DESCRIPTION: Work shall conform to the requirements of NYSDOT Section 645 with the following modifications.

MATERIAL: The cut lengths of zinc coated (galvanized) sheet metal, of the sizes listed in the proposal, shall be commercially flat, free from oil, dry and ready for painting or adhesion of reflective sheeting. Trade marks, etc., are not to be stencilled on the sheets. The base metal shall be made by the open hearth, basic oxygen, or electric furnace process.

The sheets shall be 16 gauge (U.S.S.) thick.

A uniform zinc coating shall be applied to both sides of the base metal by one of the following processes. A perfect bond and amalgamation between the base metal and the coating shall be obtained.

a. *Galvanized Sheet*: A uniform coating of zinc shall be applied to both sides of the base metal, immediately followed by a heating or galvanizing process.

b. *Mill Phosphatized*: Galvanized sheets which have been chemically processed to obtain a smooth phosphate coating of crystals which are insoluble in water to prepare the surface for immediate painting without further preparation. The coating class shall be 1.25 commercial.

The material shall meet the requirements of G-90ASTM-A526-71 except where modified above.

METHOD OF MEASUREMENT: The quantity paid for will be the number of traffic signs installed in accordance with the contract documents or directed by the Engineer.

BASIS OF PAYMENT: The unit price bid for each complete sign shall not include the post or post foundations. The post will be paid for under the appropriate item, either Item C685.03, Item C685.04, Item C685.06 or Item C685.07.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C685.3101	Traffic Sign Size 8" x 24"	Each
C685.3102	Traffic Sign Size 8" x 30"	Each
C685.3103	Traffic Sign Size 8" x 36"	Each
C685.3201	Traffic Sign Size 12" x 18"	Each
C685.3202	Traffic Sign Size 12" x 24"	Each
C685.3203	Traffic Sign Size 12" x 30"	Each
C685.3204	Traffic Sign Size 12" x 36"	Each
C685.3301	Traffic Sign Size 18" x 18"	Each
C685.3302	Traffic Sign Size 18" x 24"	Each
C685.3303	Traffic Sign Size 18" x 30"	Each
C685.3304	Traffic Sign Size 18" x 36"	Each
C685.3401	Traffic Sign Size 24" x 24"	Each

UNIT NO.	UNIT	PAY UNIT
C685.3402	Traffic Sign Size 24" x 30"	Each
C685.3403	Traffic Sign Size 24" x 36"	Each
C685.3501	Traffic Sign Size 30" x 30"	Each
C685.3502	Traffic Sign Size 30" x 36"	Each
C685.3601	Traffic Sign Size 36" x 36"	Each
C685.3602	Traffic Sign Size 36" x 48"	Each
C685.3701	Traffic Sign Size 30" Triangle	Each
C685.3702	Traffic Sign Size 36" Triangle	Each
C685.3801	Traffic Sign Size 30" 5 Sides	Each
C685.3901	Traffic Sign Size 24" Octagon	Each
C685.3902	Traffic Sign Size 30" Octagon	Each
C685.3903	Traffic Sign Size 36" Octagon	Each
C685.3904	Traffic Sign Size 30" Circle	Each
C685.3905	Traffic Sign Size 36" Circle	Each

REMOVAL OF SIGNS

DESCRIPTION: This work shall include the removal of existing signs designated on the plans or as specified by the Engineer. The sign components shall include sign panels, upright supports, bracing and structures. Signs designated for removal shall be delivered to the Monroe County Department of Public Works, Sign Fabrication Shop, 350 East Henrietta Road, at no extra cost to the County or the City of Rochester.

REMOVAL OF SIGNS: Existing traffic signs requiring removal only, shall be removed from the work site in a neat and workmanlike manner to the satisfaction of the Engineer.

REMOVAL OF CONCRETE SIGN FOOTINGS: All concrete sign footings shall be cut to a depth of 6 inches below existing ground and be replaced with suitable material as specified by the Engineer.

METHOD OF MEASUREMENT: The quantity to be paid for will be the number of completely removed signs having sign areas of the following sizes:

SIZE A:	0 to 10 Square Feet
SIZE B:	11 to 20 Square Feet
SIZE C:	21 to 40 Square Feet
SIZE D:	41 to 100 Square Feet
SIZE E:	Over 100 Square Feet

BASIS OF PAYMENT: The unit price bid for removing an existing installation shall be compensation in full for the furnishing of all labor, equipment and materials necessary to complete the work to the satisfaction of the Engineer.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C685.41	Removal of Signs - Size A (0 to 10 S.F.)	Each
C685.42	Removal of Signs - Size B (11 to 20 S.F.)	Each
C685.43	Removal of Signs - Size D (41 to 100 S.F.)	Each
C685.44	Removal of Signs - Size C (21 to 40 S.F.)	Each
C685.45	Removal of Signs - Size E (Over 100 S.F.)	Each

6/90

RELOCATING SIGNS

DESCRIPTION: The work shall conform to the requirements of NYSDOT Section 647 with the following modification for Basis of Payment.

BASIS OF PAYMENT: The unit bid price for each relocated sign shall not include the installation of new sign posts. The sign post, if needed, will be paid for under the appropriate item, either Item C685.03 or Item C685.04.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C685.46	Relocating Signs - Size A (0 to 10 S.F.)	Each
C685.47	Relocating Signs - Size B (11 to 20 S.F.)	Each
C685.48	Relocating Signs - Size C (21 to 40 S.F.)	Each
C685.49	Relocating Signs - Size D (41 to 100 S.F.)	Each
C685.50	Relocating Signs - Size E (Over 100 S.F.)	Each

5/90

MAINTAIN TRAFFIC SIGNAL EQUIPMENT

DESCRIPTION: Work shall conform to NYSDOT Section 619 with the following modifications:

The contractor shall complete traffic signal maintenance forms which shall be supplied by Monroe County Division of Highways and Traffic Engineering. These forms shall be turned in daily to the Engineer. Failure to comply with these requirements will result in a penalty of $100 per calendar day for failure to properly maintain traffic signal equipment.

The start date for maintenance of traffic signals by the Contractor will be determined by the Division of Highways and Traffic Engineering and be paid by intersection months.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C686.1611	Maintain Traffic Signal Equipment	Intersection Month

6/90

CONCRETE BASE REMOVAL (POLE OR CONTROLLER)

DESCRIPTION: The Contractor shall remove existing anchor bolt type pole bases and controller bases that are no longer required, and restore the area disturbed by the base removal.

MATERIALS: All materials used for restoration shall conform to the appropriate section of the New York State Department of Transportation Standard Specifications: Construction and Materials and as ordered by the Engineer.

CONSTRUCTION DETAILS: The Contractor shall remove the entire concrete base, or remove the top 22" to 24" of the concrete and anchor bolts. The Contractor shall backfill and restore the entire area disturbed by the base removal to an elevation level with existing ground. The restored surface area shall be replaced with material that matches existing adjacent surfaces. Sub-base course backfill material shall be consistent with the type of material used to restore the surface area.

METHOD OF MEASUREMENT: This item will be measured for payment as the number of each concrete base removed in accordance with the contract documents and as directed by the Engineer.

BASIS OF PAYMENT: The unit bid price for this item shall include the furnishing of all labor, materials, tools, equipment, and incidentals as necessary to complete the work, including excavation, removal and disposal of bases, and all materials for backfill, and to match adjacent surface area.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C686.5099	Concrete Base Removal (Pole or Controller)	Each

SHIELDED LEAD-IN CABLE

6/90

DESCRIPTION: The Contractor shall furnish Shield Lead-in Cable that conforms to the requirements of NYSDOT Item 680.71 Shielded Lead-In Cable shall apply with the following modification:

MATERIALS: Only a polyethylene jacket will be permitted.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C686.71	Shielded Lead-in Cable	Linear Foot

INDUCTANCE LOOP INSTALLATION AND SEALING

DESCRIPTION: The Contractor shall install inductance loops at the locations indicated on the plans and in accordance with the requirements of these specifications for saw cutting, sealing, lead-in conduit and conduit excavation.

MATERIALS: Loop embedding: Sealer shall be tar sealer. Tar sealer shall be 702-05 asphalt filler for joints and cracks as described in NYSDOT Section 702. Conduit and hold-down materials shall be as shown in Monroe County Standard Sheet.

CONSTRUCTION DETAILS: Inductance loops shall be installed in accordance with the Monroe County Standard Sheet.

GENERAL: This paragraph describes the work required for satisfactory completion of individual street loop detector installations. Upon completion of the work, each loop shall have been embedded in the roadway and each loop lead-in shall have been routed to the intersection cabinet location, connected to the appropriate terminal strip at the controller, and in all aspects be completely ready for connection to and operation with a detector amplifier unit. Detector installation tests shall be conducted with the detector terminated in the actual controller cabinet; however, temporary protective enclosures shall be acceptable with the approval of the Engineer in the case of cabinet delivery delays.

The component elements to be completed as part of each detector installation are described below.

INSTALLATION REQUIREMENTS: The Contractor shall, with the approval of the Engineer, locate each loop and all conduit and pull boxes in accordance with the plans and carry out all excavation, saw cutting, drilling, laying of wire, entry into existing conduits and new conduit placement as required for each detector installation.

The loop wire shall be laid in the sawed slots and run through a conduit stub to the curbside pullbox. The loop wire shall be applied to the shielded lead-in cable in the pullbox and the shielded lead-in cable pulled through conduit as shown on the plans and terminated at the intersection cabinet location. The sawed slots shall be sealed as specified with an approved material as stated above.

The detector installation must satisfy the requirements of the approved acceptance test described below, and the requirements of the special notes.

TEST REQUIREMENTS: The Contractor shall prepare vehicle detector acceptance test procedures and data forms for approval by the Engineer.

The Contractor shall conduct the approved vehicle detector acceptance test at each detector installation prior to acceptance of each installation by the County. The acceptance test shall, as a minimum, include megger checks to ground, and inductance measurement and a demonstration of proper detection of vehicle presence using a representative detector amplifier. All rate measurements shall be made at the termination point at the intersection cabinet location. Data forms approved by the Engineer shall be completed and turned over to the Engineer as the basis of acceptance.

At least one day's notice shall be given prior to all tests to permit the Engineer or his representative to observe each test.

METHOD OF MEASUREMENT: Inductance Loop Installation will be measured for payment as the number of linear feet actually installed in accordance with the Contract Documents or as directed by the Engineer.

Measurement will be made beginning at the inside wall of the pullbox. In the case of multiple loops at a single location, each loop will be measured separately along its respective full-depth saw cut beginning at the pavement cut-out, and the conduit between the pullbox and the cut-out will be measured once along the center of the conduit.

BASIS OF PAYMENT: The unit price bid per linear foot shall include the cost of pavement sawing, hold-down material, tar sealer, pavement cut-outs, conduit from pavement edge to pullbox, conduit excavation, and the furnishing of all labor, materials, tools, equipment, safety requirements and incidentals as necessary to complete the work. Inductance loop wire, pullboxes, shielded lead-in cable and loop detector modules will be paid for under their respective items.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C686.72	Inductance Loop Installation and Sealing	Linear Foot

6/90

INDUCTANCE LOOP WIRE

DESCRIPTION: The Contractor shall furnish Inductance Loop Wire that conforms to the requirements of NYSDOT Item 680.72 Inductance Loop Wire with the following modification:

MATERIALS: No flexible vinyl or polyethylene plastic tubing needed around the wire. The wire shall be XHHW.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C686.7201	Inductance Loop Wire	Linear Foot

MODIFY TRAFFIC SIGNAL EQUIPMENT

DESCRIPTION: This work shall consist of modifying existing traffic signal equipment in accordance with the contract documents or the direction of the Engineer.

MATERIALS: All new materials installed under this Item shall conform to the New York State Standard Specifications.

CONSTRUCTION DETAILS: Where shown on the project plans or directed by the Engineer, existing traffic signal equipment shall be modified as specified in the contract documents.

Care shall be exercised in modifying equipment and cable so that it will remain in its original form and existing condition wherever possible. The Contractor will be required to replace, at his expense, any traffic signal equipment which is determined by the Engineer to have been damaged or destroyed by reason of the Contractor's operations.

Any existing equipment required to be modified and found to be in unsatisfactory condition by the Engineer through no fault of the Contractor shall be replaced by new equipment. The cost thereof will be paid for under the bid prices established, or if no applicable bid price exists, then paid for as extra work.

Where it is required to locate new cabinets on existing concrete base, it shall be required under this item to install new anchor bolts in a pattern to fit the new cabinet. Such anchor bolts shall be corrosion resistant steel, and installed to a minimum depth of 4" in a manner approved by the Engineer.

METHOD OF MEASUREMENT: Payment for modifying traffic signal equipment will be made on a lump sum basis. Payment will be made for the percent of lump sum as specified on the contract plans upon completion of the modified traffic signal equipment work specified at each location.

BASIS OF PAYMENT: The lump sum price bid for modified traffic signal equipment shall be full compensation for furnishing, transporting, installing and adjusting all materials; and for all labor, tools, materials, equipment and incidentals necessary to complete the work in accordance with the plans and specifications.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C686.77	Modify Traffic Signal Equipment	Lump Sum

SIGNAL EQUIPMENT REMOVAL

6/90

DESCRIPTION: This work shall consist of removing traffic signal equipment as shown on the plans and as ordered by the Engineer.

CONSTRUCTION DETAILS: The Contractor shall carefully remove existing vehicle signal heads, mast arms, signal poles, pedestrian signal heads, pedestrian buttons and signs, sonic detectors, controllers, controller cabinets, span wires, and signal cable as shown on the plans.

The removed equipment shall be returned to the County of Monroe Division of Highways, Bridges and Traffic Engineering, Traffic Signal Complex, 350 East Henrietta Road, Rochester, New York.

Care shall be exercised in removing and salvaging electrical equipment so that it will remain in its original form and existing condition whenever possible. The Contractor will be required to replace at his own expense any traffic signal equipment which is determined by the Engineer to have been damaged or destroyed by the Contractor's operations.

METHOD OF MEASUREMENT: Payment for signal equipment removal will be made on a lump sum basis. Payment will be made for the percent of lump sum as specified on the contract plans upon completion of the signal equipment removal work specified at each location.

BASIS OF PAYMENT: The lump sum price bid for signal equipment removal shall include removal, handling, transportation and storage and all labor, tools, equipment and incidentals necessary to complete the work in accordance with the plans and specifications.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C686.79	Signal Equipment Removal	Lump Sum

PEDESTRIAN PUSH BUTTON WITH SIGN

DESCRIPTION: Under this item the Contractor shall furnish and install new pedestrian push buttons and signs. The button shall be cast aluminum with a corrosion resistant microswitch.

MATERIALS:

Cast Aluminum Case and Cover:

The case shall be an aluminum casting. The depth shall be a minimum of one and three-quarter inches. The rear shall be curved to permit mounting on four inch IPS pole as well as mounting on a flat surface.

At the rear of the case at the center shall be a wire entrance of three-quarter inch diameter.

One the vertical centerline, on one and one-quarters inch approximately centers shall be two holes for securing the case to a pole or cabinet. The case shall be reinforced at these holes to provide adequate bearing surface.

Four drilled and tapped holes shall be provided for mounting the cover upon the case wth either boss upward.

Cover:

The cover shall be the same size as the case, so as to provide a smooth outline. A corrosion resistant push button shall be located in a well on the case. Over the push shall be smooth lip to minimize entry of water into the case. A drain hole shall be located in the bottom of the well and shall open to the bottom of the case.

Four countersunk holes shall be provided in the front of the case for mounting the cover on the case.

Four stainless steel allen head screws shall be provided to mount the cover.

The push button shall be made of non-corrosive material and the stem of the button that comes in contact with the housing shall be teflon coated or plastic so as to resist a corrosive environment and prevent sticking. As an alternate, a teflon sleeve may be inserted in the housing in lieu of coating the bottom stem.

Switch and Push Button:

The single pole momentary contact normally open switch shall be attached to the rear of the cover. The switch shall be entirely enclosed electrically and insulated from the housing and push button. All metal switch parts shall be of corrosion resistant material. Contacts shall be of a material suitable for usage in highway salty air atmosphere. Screw type terminals for lugs shall be provided for wire connections. The switch shall be capable of operating on 12 or 24 voltage circuit. All switches shall be of the micro type and shall be rated for 5 amp 125 VAC. No magnetic switches shall be used. The push button shall have a maximum diameter of 1/2 inch and shall not protrude more than 1/2 inch from outer cover.

Finish:

The entire assembly with the exception of the push shall be painted Federal Yellow on the outside as indicated on the plan.

Sign:

Pedestrian signs shall be in accordance with the details as shown on the plans.

Warranty: If a pedestrian button fails, the pedestrian button will be replaced by the supplier at no expense to maintaining agency, within a period of one year.

METHOD OF MEASUREMENT: The buttons and signs will be measured for payment as the number of each unit (button and sign) furnished and installed in accordance with the contract documents or as ordered by the Engineer.

BASIS OF PAYMENT: The unit bid price for each button and sign shall include all the items specified in the material and construction details including assembly and erection, as required.

BASIS OF ACCEPTANCE: Acceptance of buttons and signs covered by this specification will be based on manufacturer's certification of compliance with the specification requirements signed by an officer of the company. Detailed drawings of the buttons shall be submitted with the certification.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C686.8026	Pedestrian Push Button with Sign	Each

MAST ARM TRAFFIC SIGNAL POLE ANCHOR BASE

6/90

DESCRIPTION: The Contractor shall furnish and install steel traffic signal poles as shown on the plans and as ordered by the Engineer.

MATERIAL: The steel poles herein specified are to be used for suspending traffic signal heads and luminaries.

Poles shall be the anchor base type and shall be either round or multisided, continuously tapered construction .14" per foot of length. The pole shall have a steel base electrically welded to the butt end of the pole. The anchor base shall telescope the butt end of the pole shaft and shall be continuously welded on the inside bottom and outside top. The pole shall be 22' in length, "3" gauge steel with a butt diameter of 11" and a bolt circle of 15" and have a minimum yield of 55,000 PSI in accordance with the latest ASTM specification.

The entire structure shall be hot dip galvanized in accordance with ASTM A123. The pole shall be one piece having no transverse joints or welds and no more than one longitudinal seam which shall be continuously welded and ground or rolled flush. Pole shall be of uniform cross section. The pole diameter shall be uniform at any cross section and the pole shall be straight. The poles shall be furnished with galvanized cast iron or aluminum removable pole caps and anchor bolt covers. Anchor bolt covers shall be attached to the base and pole by hex head bolts.

Galvanizing shall be in accordance with ASTM A123 specifications. Poles shall be furnished with a cast aluminum 3/8" dia. "J" hook bolted, or a 3/8" dia. galvanized steel "J" hook welded, inside the top of the pole and at an elevation 6" above the point of attachment of the mast arms. A grounding nut having 1/2" #13 tapped hole shall be located on the inside of the shaft above the handhole. The poles shall have a 4" x 8" reinforced handhole frame and removable cover located 12" to 15" from the butt end of the pole. Pole shall be furnished with 4-1-3/4" x 90", 60,000 p.s.i. anchor bolts. Each anchor bolt shall be threaded 6" minimum at the base-end and supplied with galvanized hexagon nuts and washers and lock nuts for this end. Anchor bolts shall be threaded 6" minimum at the base end and be provided with a 4" x 4" x 1" SQ steel nut for this end. The top 12" of the anchor bolts shall be hot dip galvanized. The pole shall be supplied with 2 brackets place at right angles for attaching mast arms and at the elevation as shown on the plans. The bracket shall be continuously welded to the pole through the use of gusset plates, and shall be tapped to receive 1-1/4" high strength bolts in accordance with ASTM A325 as shown on the plans. The bracket shall be as shown on the plans. All welding shall be in accordance with the NYS Steel Construction Manual. All material shall be in conformance with Section 724-03 Material Requirements Section A of the New York State Standard Specifications.

CONSTRUCTION DETAILS: Poles shall be erected as specified on the Plans, Standard Sheets and as directed by the Engineer. Pole and signal locations shown on the contract plans shall be field checked for any condition that may affect their placement; where changes are necessary the exact location will be determined by the Engineer. When field conditions require a change in pole position from that shown in the contract plans, the pole and mast arm length requirements may vary. It shall be the Contractor's responsibility to verify pole and mast arm length before ordering poles and mast arms.

Pole erection shall include installation of poles and attachment of fittings as specified on the Plans and Standard Sheets as follows:

a. Anchor bolt covers
b. Weatherheads and couplings, if required
c. Service bracket, if required
d. Pole cap
e. Cabinet mounting fittings, plates, brackets as needed for the cabinet being installed, if required,
f. Reinforced couplings for wire entrances to cabinets, if required.
g. Field galvanizing shall be in accordance with NYSDOT Section 719-01.

METHOD OF MEASUREMENT: Poles will be measured for payment as the number of each unit furnished and installed in accordance with the contract documents or as directed by the Engineer.

BASIS OF PAYMENT: The unit price for each pole shall include all the items specified in the construction details and the necessary grounding system, anchor bolts, pole assembly and erections and field galvanizing as required.

BASIS OF ACCEPTANCE: Acceptance of poles covered by this specification will be based on manufacturer's certification of compliance with the specification requirements signed by an officer of the company. Detailed drawings of the poles shall be submitted with the certifications.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C686.820030	Mast Arm Traffic Signal Pole Anchor Base (22')	Each

MAST ARM TRAFFIC SIGNAL POLE COMBINATION ANCHOR BASE

6/90

DESCRIPTION: The Contractor shall furnish and install steel traffic signal poles as shown on the plans and as ordered by the Engineer.

MATERIAL: The steel poles herein specified are to be used for suspending traffic signal heads and luminaries.

Poles shall be the anchor base type and shall be either round or multisided, continuously tapered construction .14" per foot of length. The pole shall have a steel base electrically welded to the butt end of the pole. The anchor base shall telescope the butt end of the pole shaft and shall be continuously welded on the inside bottom and outside top. The pole shall be 30' in length,"3" gauge steel with a butt diameter of 11" and a bolt circle of 15" and have a minimum yield of 55,000 PSI in accordance with the latest ASTM specification.

The entire structure shall be hot dip galvanized in accordance with ASTM A123. The pole shall be one piece having no transverse joints or welds and no more than one longitudinal seam which shall be continuously welded and ground or rolled flush. Pole shall be of uniform cross section. The pole diameter shall be uniform at any cross section and the pole shall be straight. The poles shall be furnished with galvanized cast iron or aluminum removable pole caps and anchor bolt covers. Anchor bolt covers shall be attached to the base and pole by hex head bolts.

Galvanizing shall be in accordance with ASTM A123 specifications. Poles shall be furnished with a cast aluminum 3/8" dia. "J" hook bolted, or a 3/8" dia. galvanized steel "J" hook welded, inside the type of the pole and at an elevation 6" above the point of attachment of the mast arms. A grounding nut having 1/2" #13 tapped hole shall be located on the inside of the shaft above the handhole. The poles shall have a 4" x 8" reinforced handhole frame and removable cover located 12" to 15" from the butt end of the pole. Pole shall be furnished with 4-1-3/4" x 90", 60,000 psi anchor bolts. Each anchor bolt shall be threaded 6" minimum on the top end and supplied with galvanized hexagon nuts and washers and lock nuts for this end. Anchor bolts shall be threaded 6" minimum at the base end and be provided with a 4" x 4" x 1" SQ steel nut for this end. The top 12" of the anchor bolts shall be hot dip galvanized. The pole shall be supplied with 2 brackets placed at right angles for attaching mast arms and at the elevation as shown on the plans. The bracket shall be continuously welded to the pole through the use of gusset plates, and shall be tapped to receive 1-1/4" high strength bolts in accordance with ASTM A325 as shown on the plans. The bracket shall be as shown on the plans. The pole shall be fitted with a simplex fitting (2 bolt type) as shown on the plans or as directed by the Engineer. All welding shall be in accordance with the NYS Steel Construction Manual. All material shall be in conformance with Section 724-03 Material Requirements Section A of the New York State Standard Specifications.

CONSTRUCTION DETAILS: Poles shall be erected as specified on the Plans, Standard Sheets and as directed by the Engineer. Pole and signal locations shown on the contract plans shall be field checked for any condition that may affect their placement; where changes are necessary the exact location will be determined by the Engineer.

When field conditions require a change in pole position from that shown in the contract plans, the pole and mast arm length requirements may vary. It shall be the Contractor's responsibility to verify pole and mast arm length before ordering poles and mast arms.

Pole erection shall include installation of poles and attachment of fittings as specified on the Plans and Standard Sheets as follows:

a. Anchor bolt covers
b. Weatherheads and couplings, if required
c. Service bracket, if required

d. Pole cap
e. Cabinet mounting fittings, plates, brackets as needed for the cabinet being installed, if required
f. Reinforced couplings for wire entrances to cabinets, if required
g. Field galvanizing shall be in accordance with NYSDOT Section 719-01.

METHOD OF MEASUREMENT: Poles will be measured for payment as the number of each unit furnished and installed in accordance with the contract documents or as directed by the Engineer.

BASIS OF PAYMENT: The unit bid price for each pole shall include all the items specified in the construction details and the necessary grounding system, anchor bolts, pole assembly and erections and field galvanizing as required.

BASIS OF ACCEPTANCE: Acceptance of poles covered by this specification will be based on manufacturer's certification of compliance with the specification requirements signed by an officer of the company. Detailed drawings of the poles shall be submitted with the certifications.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C686.820031	Mast Arm Traffic Signal Pole Combination Anchor Base (30')	Each

CONCRETE POLE BASE EXTENSION

6/90

DESCRIPTION: The work under this item shall consist of extending an existing concrete pole base. The work shall conform to the requirements of NYSDOT Section 670 with the following modifications:

MATERIALS: The new top shall be Class A cast-in-place concrete.

The slurry bond coat shall be Acryl 60 as manufactured by Thoro System Products, or owner approved equivalent.

The threaded coupling and threaded nipple shall be 50,000 psi galvanized steel conforming to ASTM A449.

CONSTRUCTION DETAILS: Concrete pole base extensions shall be installed as shown on the detail drawings in the plans.

The Contractor shall excavate by hand at the locations shown on the drawings or as ordered by the Engineer.

Existing base will be scarified or removed to accommodate a 5" minimum Class A concrete top. Prior to pouring the new top, the existing top shall be covered with a slurry bond coat. Threaded coupling and threaded nipple shall be installed as shown in the drawing on the next page.

METHOD OF MEASUREMENT: The quantity paid for will be the number of pole bases actually extended in accordance with the plans, specifications, and as ordered by the Engineer.

BASIS OF PAYMENT: The unit price shall include the cost of all material and equipment necessary for making the excavation, extending the concrete pole base, removal and reinstallation of the existing pole (including shims, hardware, and electrical connections), and backfilling and restoring the surface, including topsoil and seed, or sidewalk, or as ordered by the Engineer.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C686.830000	Concrete Pole Base Extension	Each

MAST ARM TRAFFIC SIGNAL

DESCRIPTION: The work shall consist of furnishing and installing new steel mast arms for traffic signals in accordance with the contract documents or directions of the Engineer.

MATERIALS: The steel arm masts herein specified are to be used for suspending traffic signal heads. The mast arm shall be galvanized steel of round tapered tubular construction, constructed in accordance with the latest ASTM Specifications. The arm shall be equipped with a steel flange plate electrically welded to the butt end of the mast arm. The steel flange plate shall telescope the butt end of the mast arm shaft and shall be continuously welded on the inside bottom and outside top. The entire mast arm assembly shall be hot dip galvanized in accordance with ASTM A123. The mast arm shall be furnished with four high strength steel bolts in accordance with ASTM A325 for attaching the arm to the pole. The mast arm shall be furnished with clamp and clevis assemblies for attaching traffic signal heads as shown on the plans. The mast arm shall be round continuously tapered construction .14" per foot of length. The arm shall be of one piece, having no more than one longitudinal seam, which shall be continuously welded and ground or rolled flush. Mast arm extension shall be as shown on the plans. Mast arm caps shall be as shown on the plans.

The mast arms shall be constructed to the sizes and dimensions shown on the plans.

All welding shall be performed in accordance with the New York State Steel Construction Manual.

All materials shall be in conformance with NYSDOT Section 724-03.

CONSTRUCTION DETAILS: Mast arms shall be erected as specified in the contract documents and as directed by the Engineer.

Mast arm and signal locations shown on the contract plans shall be field checked for any condition that may affect their placement; where changes are necessary the exact location will be determined by the Engineer. When field conditions require a change in mast arm length from that shown in the contract plans, the mast arm length requirement may vary. It shall be the Contractor's responsibility to verify mast arm length before ordering mast arms.

Mast arm erections shall include installation of mast arms and attachment of fittings as specified in the contract documents.

Field galvanizing shall be done in accordance with NYSDOT Section 719-01.

METHOD OF MEASUREMENT: The mast arms will be measured for payment as the number of each unit furnished and installed in accordance with the contract documents or as directed by the Engineer.

BASIS OF PAYMENT: The unit bid price for each mast arm shall include all the items specified in the material and construction details including assembly and erection, and field galvanizing as required.

BASIS OF ACCEPTANCE: Acceptance of arms covered by this specification will be based on manufacturer's certification of compliance with the specification requirements signed by an officer of the company. Detailed drawings of the arms shall be submitted with the certification.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C686.850010	Mast Arm Traffic Signal, 10' Length	Each
C686.850012	Mast Arm Traffic Signal, 12' Length	Each
C686.850014	Mast Arm Traffic Signal, 14' Length	Each
C686.850016	Mast Arm Traffic Signal, 16' Length	Each
C686.850018	Mast Arm Traffic Signal, 18' Length	Each
C686.850020	Mast Arm Traffic Signal, 20' Length	Each
C686.850022	Mast Arm Traffic Signal, 22' Length	Each
C686.850024	Mast Arm Traffic Signal, 24' Length	Each
C686.850026	Mast Arm Traffic Signal, 26' Length	Each
C686.850028	Mast Arm Traffic Signal, 28' Length	Each
C686.850030	Mast Arm Traffic Signal, 30' Length	Each
C686.850032	Mast Arm Traffic Signal, 32' Length	Each
C686.850034	Mast Arm Traffic Signal, 34' Length	Each
C686.850036	Mast Arm Traffic Signal, 36' Length	Each
C686.850038	Mast Arm Traffic Signal, 38' Length	Each
C686.850040	Mast Arm Traffic Signal, 40' Length	Each
C686.850042	Mast Arm Traffic Signal, 42' Length	Each

COAXIAL CABLE INSTALLATION

COAXIAL CABLE

DESCRIPTION: The Contractor shall furnish and install a one-half inch diameter, 75 ohm, flexible cable and connector to be used for the Rochester TCS communications interconnector.

The 1/2 inch diameter (nominal) cable shall employ an annularly, seam-welded copper outer conductor low density closed cell polyethylene foam dielectric and a copper-clad aluminum inner conductor. An outer plastic jacket shall be used so that the cable will withstand a moderate amount of scuffing when pulled through conduits without incurring any functional damage to the cable. The outer jacket shall be of a material resistant to the deteriorating action of sunlight.

Flooding compound between the plastic outer jack and the copper outer conductor shall not be required, since no direct burial environment exists in the Rochester TCS.

ELECTRICAL CHARACTERISTICS

Impedance: The characteristic impedance shall be 75 +/- 3 ohms when tested by measurement of capacitance and resonant frequency per Section 4.6.12 of MIL-C-17D.

Phase Velocity: 88 +/- 2 percent (velocity of propagation in the cable).

Cable Attenuation:

0.22dB/100 ft. at 10MHz Nom.
0.70dB/100 ft. at 100MHz Nom.
1.25dB/100 ft. at 300MHz Nom.

Average Power Rating: The cable shall be capable of handling 700W at 300 MHz with a VSWR of 1.0, ambient temperature of 40 degrees C, and an inner conductor temperature rise of 60 degrees C.

Inner Conductor Resistance: The inner conductor resistance shall be 1.3 ohm/1,000 ft., maximum.

Outer Conductor Resistance: The outer conductor resistance shall be 0.65 ohm/1,000 ft., maximum.

Cable Capacitance: 15.5 pico farads/ft. (nominal).

Continuity: The conductor continuity shall be continuous when tested in accordance with MIL-C-23806.

Insulation Resistance: The insulation resistance shall not be less than 100,000 megohms per 1,000 feet when tested in accordance with MIL-C-23806.

Dielectric Strength: The cable shall withstand 6,000 volts when tested in accordance with MIL-C-23806 except voltage will be D.C. rather than A.C.

Jacket Spark: The jacket shall withstand 8,000 VAC (60Hz) when tested in accordance with MIL-C-23806.

MECHANICAL CHARACTERISTICS

Center Conductor: The center conductor shall be copper-clad aluminum. The conductor diameter shall be 0.118", nominal.

Dielectric: The dielectric material shall be unicellular foam, flexible, polyethylene. The dielectric shall be mechanically locked to the outer conductor and bonded to the inner conductor to eliminate differential expansion.

Outer Conductor: The outer conductor of the cable shall be seam-welded, annularly corrugated copper (99.9% minimum copper content), 0.010" thick. The outside diameter of the corrugated copper outer conductor shall be 0.540" minimum.

Jacket: The jacket shall be Bakelite DFD 6005, weather resistant polyethylene with a nominal wall thickness of 0.060". The color shall be orange in accordance with Wilson Color Concentrate #30-OR-A115.

Minimum Bend Radius: The minimum bend radius of the cable shall be 5 inches.

Bending Moment: The product of force times moment arm to bend the cable over a 5 inch radius shall not exceed 3 foot-pounds.

Tensile Strength: An axial load of 200 pounds shall not cause more than a 0.2% permanent elongation.

Number of Bends: The cable shall be capable of surviving fifteen 180 degree reverse bends over a 5" radius without breaking the outer or inner conductor, or becoming oval shaped. The cable is oval shaped when diameter measurements taken at 90 degrees from each other vary by more than 10%.

Workmanship: The cable shall be manufactured and processed by best commercial practices, to be of uniform quality and free from defects that will affect life, serviceability or appearance.

Construction Requirements and Materials: The 1/2 inch corrugated coaxial cable shall be installed throughout the conduit system as shown on the plans.

COAXIAL CABLE INSTALLATION

DESCRIPTION: This section describes the requirements for the installation of the 1/2 inch flexible coaxial cable specified for the Rochester TCS interconnect. The routing of this cable is defined in the contract plans. Changes to cable routing shall be made only at the explicit direction of the Engineer.

Conduit Preparation:

The Contractor shall have prepared the conduit for pulling coaxial cable under other bid items of this contract.

Cable Pulling Aids and Handling Precautions:

The 1/2 inch flexible cable shall be attached to the pulling cable by means of a braided pulling sleeve of 3 feet minimum length. Pulling force shall not exceed 200 pounds and shall not cause more than a 0.2% permanent elongation. A quick-disconnect pulling harness shall be employed to insure that the pulling force is not exceeded.

The cable jacket shall be lubricated with a nuetral lubricant that will not attack the polyethylene jacket to minimize pulling friction. An "elephant trunk" cable guide shall be employed between the top of the manhole and the entrance end of the conduit to prevent cable damage where deemed necessary by the Engineer.

Caution shall be observed by the Contractor in pulling of cable through the conduits to prevent damage to cable jackets, shields and conductors. When a cable is pulled into a conduit the end of the cable shall be covered with polyvinyl chloride shrink sleeving to exclude moisture, and it shall be so kept until connections are made with terminations equipment. Both the shrink sleeving and the manner in which it is applied shall be approved by the Engineer before being used.

Cable pulleys shall be used at all locations where a change in direction of the cable would otherwise create excessive pulling drag. Mechanical pulling aids may be used providing the pulling forces do not exceed the maximum tensile limit of 200 pounds for the coax cable. Reel brakes shall be provided to ensure that the cable does not "kink" coming off the reel.

Cable Connections and Splicing:

All cable connections shall be made above ground in the controller cabinets as designated by the plans. The method of connector attachment is described in attachment procedures.

No splicing of the coax cable shall be permitted except at times and in locations approved by the Engineer. When splicing is permitted, it shall be performed using male in-line coaxial connectors. A female 5/8-24 joining connector shall be used between the two cable ends to join them together. All splicing connectors shall be covered with polyvinyl chloride shrink sleeving applied by an approved method to form an immersion-proof connection. The application and method shall be approved by the Engineer before being used in each location where splicing is permitted.

Cable Installation Between the Manhole or Pull Box and Cabinet:

When pulling the cable from the nearest manhole or pull box to the equipment or controller cabinet at curb-side, it shall not be broken and spliced to a second interconnecting cable to complete the run.

Instead a length of cable shall be pulled out of the exit end of the primary conduit in the manhole or pull box sufficient in length to reach the designated equipment cabinet at curb side. A pull cable shall be used in the manhole or pull box to conduit to pull this remaining length of cable through and up into the cabinet with sufficient length to reach the amplifier, or tap, to which it is to be connected.

Cable coiling in the manhole or pull box will be as ordered by the Engineer. The coil shall be tied back to prevent interference with other cabling in the manhole or pull box or with access to junction boxes, etc.

Attachment Procedure for 5/8" x 24 Connectors:

The following procedure shall be used to prepare the coax cable end and attach the 5/8" x 24 connectors used for all splices and cable connections:

1. Step 1: Measure from end of cable 3 1/8 inch. Remove outer plastic jacket for this length. Make a clean square cut using a sharp metal tubing cutter such as Rigid Tool #104*. Slit length of jacket to be removed with an Xacto knife, or single edge razor, and remove jacket.
See diagram at end of section. * McMasters Catalog #84, Part No. 2764A12.

2. Step 2: Scribe a line on corrugated outer conductor ridge to nearest 1 1/4 inch from jacket cut. (Do not put clamping nut on at this stage.)

Align cutting wheel of tubing cutter on scribed line and proceed to cut through copper outer conductor. Avoid cutting deeply into foam dielectric.
See diagram at end of section.

3. Step 3: Using a BX cable conduit cutter (McMasters - Carr #3760A11, or equivalent*) make a longitudinal cut from end of cable to circular cut in outer conductor (Point A to Point B in diagram). This cut should be no closer than approximately 1/4 inch to the circular cut at B. Finish longitudinal cut with minisnips, or small diagonal cutters. Peel outer conductor off without use of pliers.
* McMasters Catalog #84, Part No. 37060A11.

4. Step 4: Detach foam dielectric. Separate all foam dielectric completely from edge of outer conductor to assure good electrical contact with outer body. Refer to enlarge cutaway view in Step 5 which illustrates positive grip of outer conductor between clamping nut and outer body. Use tip of knife and work around entire circumference. Remove burrs from inside edge of outer conductor with knife. Use wire brush to remove copper particles from foam. Clean remainder of foam from center conductor with medium grade garnet cloth, especially outer half inch of conductor. (It is not necessary to strip all of the dielectric from the center conductor along its inner 3/4 inches). Under cut the end of the copper outer conductor with knife and trim with flat file.
See diagram at end of section.

Add thin red "O" ring gasket to second fully exposed corrugation groove jacket. Apply thin coating of silicone grease to outer surface.

5. Step 5: Inspect contact surface. Thread outer body onto clamping nut and tighten with wrenches. Turn outer body only, do not turn clamping nut. While connector is assembled, trim exposed inner conductor to 1 3/16 inch (30mm). Disassemble connection to inspect for good metal-to-metal contact.
See diagram at end of section.

6. Step 6: Add "O" ring gaskets. Place small "O" ring gasket into groove in outer body, and thick red "O" ring gasket into groove in clamping nut. Add thin coating of silicone grease to outer surfaces of gaskets.

Grounding: The copper outer conductor must make intimate contact with the back nut contract fingers after assembly of the 5/8 x 24 male cable connectors. The cable ground return is made via the outer copper jacket to the ground rod.

ENVIRONMENTAL REQUIREMENTS

Operating Temperature: The operating temperature range of the cable shall be -40 degrees F to +165 degrees F.

Installation Temperature: The cable shall be capable of being installed over a temperature range of -40 degrees to +120 degrees F.

Water Immersion: The cable shall be capable of indefinite operation with no measurable change in its electrical characteristics when subjected to immersion in water.

All other environmental conditions for communication cable shall conform to NEC Code 1975, Article 820-10 through 820-22. Refer to National Electrical Code of 1975 (ANSI C1-1975).

MALE CONNECTORS FOR 1/2 INCH FLEXIBLE COAXIAL CABLE

Mechanical Requirements: The 5/8 inch x 24 connector shall be constructed of brass with a protective plating of nickel, or other suitable non-corrodible plating. A fluorocarbon center conductor spacer, or insert shall be used. Rubber, or neoprene, "O" rings shall be provided for prevention of moisture intrusion between the cable outer conductor and the connector body as well as an "O" ring for sealing the back of the connector to the cable outer plastic jacket.

The connector shall be a male connector which utilizes the center conductor of the cable itself as the center pin of the connector. Connector thread size shall be 5/8 inch diameter x 24 threads/inch to mate with all standard CATV amplifiers and passive hardware, such as taps, power dividers and terminations.

"O" Rings:

The connector will incorporate a minimum of two "O" rings of a material compatible with silicone grease. One must seal the inside connector body to the corrugated outer conductor of the coaxial cable by seating in one of the corrugation grooves. The second "O" ring must seal the back of the connector to the cable outer jacket. A minimum of parts shall be used for the sake of economy of construction and ease of assembly.

Back Part:

The back part, or clamping nut, of the connector shall incorporate some form of finger stock construction which shall make intimate contact to an outer conductor corrugation groove when the connector is fully assembled. This must provide solid electrical (ground) continuity between the cable outer conductor and the connector body when assembled.

Length:

Overall length of the assembled connector shall not exceed 2 1/8 inches.

Electrical Requirements

Impedance:

Characteristic Zo of the connector shall be 75 +/- 2 ohms when assembled on the end of the 1/2 inch flexible corrugated coaxial cable.

Environmental Requirements:

All passive components shall function normally under the following environmental conditions.

Temperature Range:

-35 degrees F to +165 degrees F.

Humidity:

100 percent at 70 degrees F.

Immersion:

No water shall enter the cable connectors, or cable interfaces, when fully immersed in water at a temperature of 80 degrees F for a period of 2 hours minimum.

QUALITY ASSURANCE PROVISIONS

Production Tests: The following tests shall be made by the Contractor on all cable manufactured and furnished for this specifications. These tests shall be made, certified to be in accordance with this specification and signed by an authorized representative of the Contractor. A copy of the test results shall be furnished to the Engineer for all delivered cable.

1. Continuity
2. Insulation Resistance
3. Dielectric Strength
4. Jacket Spark Test
5. Structural Return Loss shall be performed from 5-300MHz in the following manner:
A frequency sweeper and bridge shall be employed to measure structural return loss. All cable reels to be delivered shall be so inspected. Any reading of structural return loss of less than 20dB shall be cause for rejection of said reel of cable.

Pre-installation Conditions of Acceptance and Post-Installation Tests:

No cable which shows bruises or shipping damages shall be installed in the Rochester TCS system. All cable shall be visually inspected by the Engineer for such damage as the cable is payed out during installation. The Contractor shall return damaged cable to the Manufacturer and replace it at no cost to the County.

Post-Installation Tests: After the cable is installed and connectors attached to the cable shall be subjected to two tests. First the cable shall be tested between equipment cabinets using a Time Domain Reflectometer (TDR), to reveal any electrical discontinuities due to cable damage, or improper connector attachment. The cable shall be properly terminated at the far end of the test run with a 75 ohm termination for this test.

Secondly, each cable run between cabinets shall be subjected to a test for excess losses by means of any automatic electronic Megger (Megohm Ohmeter) of late design with the ends of the cable open circuited (no termination at either end). The insulation resistance shall not be less than 100,000 megohms per 1,000 feet when tested in accordance with MIL-C-23806. All cable which fails to pass either test shall be removed and replaced at no cost to the County.

METHOD OF MEASUREMENT: The quantity to be paid for in this item shall be the lineal feet of furnished and installed cable.

BASIS OF PAYMENT: The price bid shall be a unit price per linear foot of furnished, installed, terminated with coaxial cable connectors and tested cable. No payment will be made for cable which fails to pass the specified post-installation tests. The costs of all cable connectors, hooks, racks, and other devices for supporting the cable in manholes, pull wire, material, installation labor, tools and equipment required for cable installation shall be included in the unit price of this item.

Payment shall be made for each installed section upon successful completion of the approved communications network test.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C686.9916	Coaxial Cable Installation	Linear Foot

REMOVAL OF COAXIAL CABLE

DESCRIPTION: Under this item the Contractor shall remove existing coaxial cable as indicated on the plans.

CONSTRUCTION REQUIREMENTS: Prior to and after removal the Contractor shall perform the following tests:

1. The cable shall be tested between equipment cabinets using a Time Domain Reflectometer to reveal any electrical discontinuities.

2. The cable shall be tested for excess loss by means of an automatic electronic Megger with the ends of the cable open circuited. The insulation resistance shall be not less than 100,000 megohms per 1,000 feet when tested in accordance with MIL-C-23806.

All cable which fails either test after removal shall be replaced by the Contractor at no cost to the County.

Prior to removing the cable, the connectors shall be removed and returned to County Traffic Engineering. Care shall be taken when removing the cable to avoid kinking or damaging. The cable shall be coiled on large diameter reels and delivered to the County of Monroe, Division of Traffic Engineering. Each piece of cable shall be tagged with the length indicated. The cable shall not be bent less than a 10" radius at any time. Special pulleys or shoes may be used to assure minimum bending. The pulling tension in removal cannot exceed 200 pounds so as not to stretch the cable.

METHOD OF MEASUREMENT: The quantity to be paid for shall be the linear feet of cable removed.

BASIS OF PAYMENT: The price bid shall be a unit price per linear foot for removing all cable including all labor, tools and equipment required for removal.

Payment shall be made after testing and delivery to the County Division of Traffic Engineering.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C686.9917	Removal Of Coaxial Cable	Linear Foot

GALVANIZED STEEL PEDESTRIAN SIGNAL POLE

DESCRIPTION: The Contractor shall furnish and install steel pedestrian signal poles as shown on the plans and as ordered by the Engineer.

MATERIAL: The pole shall consist of a shaft of 4 1/2" diameter with anchor base, handhole, and pressed steel pole cap, with cap screws. The pole shall be 14'0" overall. Pole shall maintain a minimum safety factor of 1.82 based on yield strength for basic wind pressure of 33 psf.

The shaft shall be made from the best grade hot rolled basic open hearth steel of not less than #11 Manufacturer's Standard Gauge, and it shall be formed, welded and longitudinally cold rolled under sufficient pressure to flatten the weld, form a round tube and improve the physical characteristics of the metal to insure minimum yield strength of 48,000 psi. Shaft shall be made from one length of steel sheet.

The shaft may be four (4) inch nominal diameter standard weight pipe at the option of the bidder.

A one-piece cast steel anchor base conforming to ASTM A27-58, Grade 65-35, or the latest revision thereof, of adequate strength, shape and size with a scalloped top flange shall be secured to the lower end of the shaft by two continuous electric arc welds. The base shall telescope the shaft. One weld shall be on the inside of the base at the end of the shaft, and the other weld shall be on the outside of the shaft at the top of the base. Four removable cast iron or aluminum covers conforming to ASTM A126-42, Class A, or the latest revisions thereof, shall be provided with each base and shall be attached to the base by hex head cap screws. A ventilation hole shall be provided in the shaft at each anchor bolt location.

A grounding nut having 1/2" #13 tapped hole shall be located on the inside of the shaft immediately above the weld.

Four high strength steel anchor bolts will be included, each fitted with a hexagon nut, a heavy square leveling nut and a lock washer. Each anchor bolt shall have an "L" bend at the ends and all nuts and washers shall be galvanized. The anchor bolts shall be capable of resisting at yield strength and the bending moment of the shaft at its yield strength stress.

A handhole, 3" x 5" in size, consisting of a steel reinforcing frame securely welded into the shaft and with a removable steel handhole cover assembly shall be furnished with each hole.

The pole, including all component parts, shall be hot dipped galvanized inside and outside in accordance with the applicable specifications for zinc coating ASTM A123, or the latest revisions thereof. All threaded holes shall be tapped clean and greased with a silicone grease.

CONSTRUCTION DETAILS: Poles shall be erected as specified on the plans, Monroe County Standard Sheets and as directed by the Engineer.

Pole and signal locations shown on the contract plans shall be field checked for any condition that may affect their placement; where changes are necessary the exact location will be determined by the Engineer.

Pole erection shall include installation and attachment of fittings as specified on the plans and standard sheets as follows:

a. Anchor bolt covers
b. Weatherheads and couplings, if required

c. Pole caps
d. Reinforced couplings for wire entrances, if required

METHOD OF MEASUREMENT: Poles will be measured for payment as the number of each unit furnished and installed in accordance with the contract documents or as directed by the Engineer.

BASIS OF PAYMENT: The unit price bid for each pole shall include all items specified in the construction details and the necessary grounding system, anchor bolts, pole assembly and erections and field galvanizing as required.

BASIS OF ACCEPTANCE: Acceptance of poles covered by the specification will be based on manufacturer's certification of compliance with the specification requirements signed by an officer of the company. Detailed drawings of the poles shall be submitted with the certifications.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C686.9941	Galvanized Steel Pedestrian Signal Pole	Each

PULLBOX

DESCRIPTION: The Contractor shall furnish and place pullboxes as shown on the plans or as directed by the Engineer.

MATERIALS: The pullboxes shall be built of Class A concrete, or may be an approved pre-cast pullbox. The Contractor shall submit drawing of pre-cast pullboxes to the Engineer for approval.

Concrete shall be in accordance with NYSDOT Section 501- Portland Cement Concrete and shall be Class A.

Common Brick shall conform to the NYSDOT requirements of 704-01 Common Brick. Approved pre-cast pullboxes may be used with the approval of the Engineer.

The pullbox shall have a cable bracket support on each of the four walls as shown on the Plans.

All frames and covers shall meet the NYSDOT requirements for 715-05 Iron Castings, and shall conform to the detail as shown on the Plans.

CONSTRUCTION DETAILS: Pullboxes shall be constructed and installed in accordance with the details specified on the Standard Sheets, Plans, or as directed by the Engineer.

Cast iron frames and covers shall be furnished and placed on each pullbox. They shall be set in mortar and placed true to line and grade and make full and even bearing on the underlying construction surface. The frame and cover shall be as shown on the standard sheet or plans. Frames and covers which do not fit together properly will be rejected by the Engineer and shall be removed from the site.

METHOD OF MEASUREMENT: The pullboxes will be measured for payment as the number of each unit furnished and installed in accordance with the contract documents or as directed by the Engineer.

BASIS OF PAYMENT: The unit bid price for each pullbox shall include all concrete, reinforcing steel, crushed stone or gravel, or sand, extensions, excavating and backfill, frames, covers, restoration of surfaces, cable, brackets, and furnishing all labor, materials and equipment necessary to complete the work.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C686.994401	Pullbox (24")	Each
C686.994402	Pullbox (30")	Each

6/90

MODIFY TRAFFIC SIGNAL CABLE

DESCRIPTION: The Contractor shall modify traffic signal cable as shown on the plans and as ordered by the Engineer.

MATERIALS: All new materials used under this item shall conform to NYSDOT Section 680-2.01.

CONSTRUCTION DETAILS: The Contractor shall carefully remove the existing traffic signal cables from the existing controller cabinet and pull them back to the pull box or manhole shown on the plans. Any power cable that is to be relocated shall be re-energized before relocation. The Contractor shall reinstall the traffic signal cables and wire to the new controller cabinet as shown on the plans and as ordered by the Engineer. The Contractor shall be responsible for determining if the length of existing cable is adequate to perform the modification before the work is begun. If the existing cable appears too short to perform the modification, he shall notify the Engineer.

METHOD OF MEASUREMENT: This item will be measured for payment as the number of each intersections at which signal cables and wire from the existing controllers are modified.

BASIS OF PAYMENT: The unit price bid shall include the furnishing of all labor, materials, tools, equipment and incidentals necessary to complete the work. Any cables damaged by the Contractor shall be replaced at the Contractor's expense. No splicing will be allowed.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
C686.9955	Modify Traffic Signal Cable	Each

APPENDIX

SPECIFICATION LISTING

GENERAL

The following Standard items are acceptable for use as City of Rochester Standard Specifications. The work shall conform to the requirements of the appropriate Section for these items:

ITEM NO.	ITEM	PAY UNIT
SECTION R200 EARTHWORK		
201.0601	Clearing and Grubbing	LS
202.20	Removing Old Bituminous Concrete Overlay	SY
203.01	Unclassified Excavation and Embankment	CY
203.02	Unclassified Excavation and Disposal	CY
203.03	Embankment in Place	CY
203.07	Select Granular Fill	CY
C203.0751	Select Granular Fill Over Pipes	CY
C203.0951	Crushed Stone	CY
203.20	Select Granular Subgrade	CY
203.21	Select Structure Fill	CY
R203.22	Rock Excavation and Disposal	CY
R203.23	Select Granular Backfill (Pipe)	CY
R203.24	Select Granular Backfill (PVCP Pipe)	CY
R203.25	Stone Bedding	CY
R203.26	Sand	CY
R204.01	Milling - Variable Depth	SY
R204.02	Milling - 2" Thickness	SY
R204.03	Milling - 3" Thickness	SY
R204.04	Milling - 4" and over Thickness	SY
R205.01	Concrete Base Repair	SY
R205.02	Asphalt Base Repair - Commercial	SY
R205.03	Asphalt Base Repair - Residential	SY
C206.0315	Traffic Signal Conduit Excavation and Restoration in Asphalt Concrete	LF
C206.0316	Traffic Signal Conduit Excavation and Restoration in Portland Cement Concrete	LF
C206.0317	Traffic Signal Conduit Excavation and Restoration in Composite Pavement	LF
C206.0318	Traffic Signal Conduit Excavation and Restoration in Concrete Sidewalks and Driveways	LF
C206.0319	Traffic Signal Conduit Excavation and Restoration in Asphalt Sidewalks and Driveways	LF
C206.0320	Traffic Signal Conduit Excavation and Restoration in Grass and Unpaved Areas	LF
R206.04	Trench and Culvert Excavation	CY
R206.05	Trench and Culvert Rock Excavation	CY

ITEM NO.	ITEM	PAY UNIT
C206.0501	Trench Excavation	CY
C206.0502	Trench Excavation - Solid Rock Blasting Method	CY
C206.0503	Trench Excavation - Solid Rock Mechanical Method	CY
C206.0504	Test Pit Excavation	CY
R206.06	Conduit Excavation and Backfill	LF
C206.0601	Abandon Existing Sewer	CY
R206.07	Excavation for Test Pits	CY
R206.08	Rock Excavation for Test Pits	CY
207.01	Geotextile Bedding	SY
207.02	Geotextile Undercut	SY
207.03	Geotextile Underdrain	SY
207.04	Geotextile Slope Protection	SY
R207.05	Polyester Fiber Fabric Reinforcement	SF
SECTION 300 BASES AND SUBBASES		
302.01	Bituminous Stabalized Course	CY
303.01	Optional Flexible Shoulder	SY
304.02	Subbase Course, Type 1	CY
304.03	Subbase Course, Type 2	CY
308.01	Soil Cement Course	CY
SECTION R400 BITUMINOUS PAVEMENTS		
403.11	Asphalt Concrete-Type 1 Base Course	TON
403.13	Asphalt Concrete-Type 3 Binder Course	TON
403.1901	Asphalt Concrete-Type 7F Top Course (High Friction) Marshall Design	TON
403.21	Asphalt Concrete-Truing and Leveling Course	TON
R404.01	Recycled Asphalt Base Course	TON
R404.02	Recycled Asphalt Binder Course	TON
R404.03	Recycled Asphalt Top Course	TON
R404.04	Recycled Asphalt Concrete - Truing and Leveling Course	TON
R406.01	Pavement Key	LF
R407.02	Tack Coat	SY
R407.03	Tack Coat	GAL
R408.01	Seal Coat	SY
R412.01	Temporary Pavement	SF
R412.02	Temporary Pavement with Subbase	SF
R412.03	Temporary Pavement - Asphalt Milling Pavement	SF
R412.04	Temporary Pavement - Asphalt Milling Pavement with Subbase	SF
SECTION R500 RIGID PAVEMENTS		
502.04	Cement Concrete Pavement, Reinforced, Class C	CY
502.05	Cement Concrete Pavement, Reinforced, Class F	CY

ITEM NO.	ITEM	PAY UNIT
502.06	Cement Concrete Pavement, Unreinforced, Class C	CY
502.10	Metal Reinforcement for Concrete Pavement (10' wide or greater)	SY
502.11	Metal Reinforcement for Concrete Pavement (less than 10' wide)	SY
502.20	Transverse Joint Supports (all types)	LF
502.30	Longitudinal Joint Ties	EA
502.32	Longitudinal Joint Ties (Grout type)	EA
502.33	Longitudinal Joint Ties (Curbing)	EA
502.42	Constructing and Sealing Transverse Expansion Joints	LF
502.43	Constructing and Sealing Special Joints	LF
503.0101	Cement Concrete Foundation for Pavement, Unreinforced, Class C	CY
503.02	Cement Concrete Foundation for Pavement, Unreinforced, Class F	CY
R504.01	Class K Concrete	CY
R504.02	Class L Concrete	CY
R505.01	Restore Existing Brick Pavement	SF
R505.02	New Pavers for Brick Pavement	SF
SECTION R550 STRUCTURES		
552.01	Permanent Timber Sheet Piling	SF
C552.0101	Permanent Timber Sheet Piling	SF
552.02	Permanent Steel Sheet Piling	SF
552.03	Temporary Timber Sheet Piling	SF
C552.0301	Temporary Timber Sheet Piling	SF
552.04	Temporary Steel Sheet Piling	SF
552.05	Safe Operation Sheet Piling	SF
C552.0501	Safe Operation Sheet Piling	SF
552.06nnnn	Cofferdams	EA
552.07	Cofferdams (Water Discharge Control)	EA
555.0101	Concrete for Structures, Class A (Mass Placements)	CY
555.0103	Concrete for Structures, Class A (Appurtenant Placements)	CY
C555.010301	Concrete Cradle or Encasement	CY
555.05	Concrete for Structures, Class F	CY
56.0101	Uncoated Steel Fabric Reinforcement for Structures	SF
556.0102	Epoxy Coated Steel Fabric Reinforcement	SF
56.0201	Uncoated Bar Reinforcement for Concrete Structures	LB
556.0202	Epoxy-Coated Bar Reinforcement for Structures	LB
560.01	Dimension Stone Masonry	SF
560.02	Split Faced Concrete Masonry	SF
560.03	Stone Masonry - Type A	CY

ITEM NO.	ITEM	PAY UNIT
560.04	Stone Masonry - Type B	SF
560.05	Rubble Stone Masonry	CY
560.06	Rubble Stone Masonry Laid Dry	CY
560.07	Precast Concrete Coping	LF
583.01	Shotcrete	BAG
R590.01	Window Well	EA
R591.01XX	X' x X' Sidewalk Hatch (Street Address)	EA
R592.01XX	Areaway Abandonment (Street Address)	LS
R593.01XX	Excavation Over Existing Areaway Roof (Street Address)	LS
SECTION R600	**INCIDENTAL CONSTRUCTION**	
R601.01XX	X" Extra-Strength Vitrified Clay Pipe	LF
R601.02XX	X" Polyvinyl Chloride Pipe, SDR21	LF
R601.03XX	X" Extra-Heavy Cast Iron Soil Pipe	LF
R601.04XX	X" Extra-Strength Vitrified Clay Riser Pipe	LF
R601.05XX	X" Polyvinyl Chloride Riser Pipe, SDR 21	LF
R601.06XX	X" Extra-Heavy Cast Iron Soil Riser Pipe	LF
R601.07	Lateral Connection to Existing Catch Basin	EA
R601.08	Lateral Connection to Existing Lateral	EA
R601.09	Lateral Connection to Existing Stone Box Sewer	EA
R601.10	Lateral Connection to Existing Brick Sewer	EA
R601.11	Lateral Connection to Existing Manhole Opening	EA
R601.12	Lateral Connection to Existing Manhole	EA
R601.13	Lateral Connection to Existing Manhole, Including Outside Drop Connection	EA
R601.14XX	X" x X" Extra-Strength Vitrified Clay Branch at Existing Sewer	EA
R601.15XX	X" x X" Polyvinyl Chloride Branch at Existing Sewer	EA
R601.16XX	X" x X" Extra-Heavy Cast Iron Soil Branch at Existing Sewer	EA
R601.17XX	X" x X" x X" Extra-Strength Vitrified Clay Double-Branch at Existing Sewer	EA
R601.18XX	X" x X" x X" Polyvinyl Chloride Double-Branch at Existing Sewe	EA
R601.19XX	X" Extra-Strength Vitrified Clay Saddle Branch	EA
R601.20XX	X" Polyvinyl Chloride Saddle Branch	EA
R601.21XX	X" Extra-Heavy Cast Iron Saddle Branch	EA
C603.0412XX	Vitrified Clay Pipe, Extra Strength, XX" Diameter	LF
C603.6003XX	Reinforced Concrete Pipe, Class III, Steel Ring Joints, XX" Diameter	LF
C603.6004XX	Reinforced Concrete Pipe, Class III, Rubber Gasket Joints, XX" Diameter	LF

ITEM NO.	ITEM	PAY UNIT
C603.6103XX	Reinforced Concrete Pipe, Class IV, Steel Ring Joints, XX" Diameter	LF
C603.6104XX	Reinforced Concrete Pipe, Class IV, Rubber Gasket Joints, XX" Diameter	LF
C603.6203XX	Reinforced Concrete Pipe, Class V, Steel Ring Joints, XX" Diameter	LF
C603.6204XX	Reinforced Concrete Pipe, Class V, Rubber Gasket Joints, XX" Diameter	LF
C603.945101	Cast Iron Soil Pipe Lateral, Extra Heavy, 4" Diameter to 6" Diameter	LF
C603.9451XX	Cast Iron Soil Pipe Lateral, Extra Heavy, XX" Diameter	LF
C603.945201	Cast Iron Soil Pipe Lateral Riser, Extra Heavy, 4" Diameter to 6" Diameter	LF
C603.9452XX	Cast Iron Soil Pipe Lateral Riser, Extra Heavy, XX" Diameter	LF
C603.9581XX	Ductile Iron Pipe, Class 52, XX" Diameter	LF
C603.9908XX	Polyvinyl Chloride Pipe, SDR 35, XX" Diameter	LF
C603.9909XX	Polyvinyl Chloride Pipe, SDR 26, XX" Diameter	LF
C603.9910XX	Polyvinyl Chloride Pipe, SDR 21, XX" Diameter	LF
C603.992101	Polyvinyl Chloride Pipe Lateral, SDR 21, 4" Diameter to 6" Diameter	LF
C603.9921XX	Polyvinyl Chloride Pipe Lateral, SDR 21, XX" Diameter	LF
C603.992201	Polyvinyl Chloride Pipe Lateral Riser, SDR 21, 4" Diameter to 6" Diameter	LF
C603.9922XX	Polyvinyl Chloride Pipe Lateral Riser, SDR 21, XX" Diameter	LF
C604.044801	Manhole, 4' Diameter, Precast Base, up to 6.0' Deep	EA
C604.044802	Manhole, 4' Diameter, Cast-in-Place Base, up to 6.0' Deep	EA
C604.044803	Additional Depth of 4' Diameter Manhole	LF
C604.046001	Manhole, 5' Diameter, Precast Base, up to 6.0' Deep	EA
C604.046002	Manhole, 5' Diameter, Cast-in-Place Base, up to 6.0' Deep	EA
C604.046003	Additional Depth of 5' Diameter Manhole	LF
C604.0499XX	Junction Chamber No. X	LS
C604.076001	Connect Existing 4" to 6" Lateral to New Sewer	EA
C604.0760XX	Connect Existing XX" Lateral To New Sewer	EA
C604.076103	Connect New 4" to 6" Lateral to Existing or New Sewer	EA
C604.0761XX	Connect New XX" Lateral to Existing or New Sewer	EA
C604.0762XX	Connect New XX" Sewer to Existing Manhole	EA
C604.0763XX	Connect New XX" Sewer to Existing Stone Box Sewer	EA

ITEM NO.	ITEM	PAY UNIT
C604.0764XX	Connect New XX" Sewer to Existing Sewer with Concrete Collar	EA
C604.0765XX	Connect New XX" Sewer to Existing Sewer with Elastomeric Sleeve	EA
C604.0766XX	Connect New Manhole to Existing XX" Sewer	EA
C604.0767XX	Connect New Receiving Basin to Existing Lateral	EA
C604.0768XX	Connect New Manhole to Existing or New XX" Sewer with Outside Drop Connection	EA
C604.0769XX	Connect Existing Manhole to Existing or New XX" Sewer with Outside Drop Connection	EA
R604.11	Type A Catch Basin	EA
R604.12	Type B Catch Basin	EA
R604.13	Type C Catch Basin	EA
R604.14	Additional Depth Type A Catch Basin	LF
R604.15	Additional Depth Type B Catch Basin	LF
R604.16	Additional Depth Type C Catch Basin	LF
R604.17	Adjust Existing Catch Basin Frame and Grate	EA
R604.18	Adjust Existing Capstone Catch Basin Frame and Grate	EA
R604.19	Relocate Existing Catch Basin	EA
R604.20	Clean Existing Catch Basin and Lateral	EA
R604.21	Adjust Existing Manhole Frame and Cover	EA
R605.12	6" Corrugated Polyethylene Underdrain Pipe	LF
R605.13	Underdrain Filter Material	CY
606.10	Box Beam Guide Railing	LF
606.11	Box Beam Guide Railing (Shop Curved)	LF
606.14	Box Beam Guide Railing End Assembly	EA
606.20	Corrugated Beam Guide Railing	LF
606.2001	Corrugated Beam Guide Railing (Shop Curved)	LF
606.22	Anchorage Units for Corrugated Beam Guide Railing	EA
606.50	Resetting Corrugated Beam Guide Railing	LF
606.52	Resetting Box Beam Guide Railing	LF
606.54	Resetting Corrugated Beam Guide Railing (New Posts)	LF
606.57	Resetting Anchorage Units for Corrugated Beam Guide Railing or Mall Barrier	EA
606.58	Resetting Box Beam Guide Railing End Assembly	EA
606.62	Removing and Storing Corrugated Beam Guide Railing	LF
606.64	Removing and Storing Box Beam Guide Railing LF	
606.67	Removing and Storing Anchorage Units for Corrugated Beam Guide Railing and Mall Barriers	EA
606.68	Removing and Storing Box Beam Guide Railing End Assembly	EA
606.71	Removing and Disposing Cable Guide Railing	LF
606.72	Removing and Disposing Corrugated Beam Guide Railing	LF

ITEM NO.	ITEM	PAY UNIT
606.74	Removing and Disposing Box Beam Guide Railing	LF
606.76	Removing and Disposing Anchorage Units for Cable Guide Railing	EA
606.77	Removing and Disposing Anchorage Units for Corrugated Beam Guide Railing and Mall Barrier	EA
606.78	Removing and Disposing Box Beam Guide Railing End Assembly	EA
606.91	Resetting Box Beam Guide Railing (New Posts)	LF
R607.21	4' Chain Link Fence	LF
R607.22	6' Chain Link Fence	LF
R607.23	8' Chain Link Fence	LF
R607.24	4' Chain Link Fence w/P.D.S. Slats	LF
R607.25	6' Chain Link Fence w/P.D.S. Slats	LF
R607.26	8' Chain Link Fence w/P.D.S. Slats	LF
R607.27	Relocate Existing Chain Link Fence	LF
R607.28	Relocate Existing Wood Fence	LF
R607.29	Relocate Existing Wire Fence	LF
R607.30	4' Stockade Fence	LF
R607.31	6' Stockade Fence	LF
R608.12	Concrete Sidewalk and Driveway	CY
R608.13	Concrete Sidewalk and Driveway (Including Excavation)	CY
R608.14	Concrete Sidewalk and Driveway (Including Excavation and Gravel)	CY
R608.15	Asphalt Driveway - Light Duty	SF
R608.16	Asphalt Driveway - Medium Duty	SF
R608.17	Asphalt Driveway Overlay	TON
R608.18	Brick Sidewalk and Driveway	SF
R608.19	Reset Existing Brick Pavers	SF
R608.20	Reset Existing Stone Sidewalk - Light Duty	SF
R608.21	Reset Existing Stone Sidewalk - Heavy Duty	SF
R608.22	Salvage Existing Stone Sidewalk	SF
R609.21	4" Stone Curb	LF
R609.22	4" Radius Stone Curb	LF
R609.23	5" Stone Curb	LF
R609.24	5" Radius Stone Curb	LF
R609.25	5" Mountable Stone Curb	LF
R609.26	5" Mountable Radius Stone Curb	LF
R609.27	Reset Existing Stone Curb	LF
R609.28	4" Stone Curb - Curb Replacement	LF
R609.29	4" Radius Stone Curb - Curb Replacement	LF
R609.30	5" Stone Curb - Curb Replacement	LF
R609.31	5" Radius Stone Curb - Curb Replacement	LF

ITEM NO.	ITEM	PAY UNIT
R609.32	5" Mountable Stone Curb - Curb Replacement	LF
R609.33	5" Mountable Radius Stone Curb - Curb Replacement	LF
R609.34	Reset Existing Stone Curb - Curb Replacement	LF
R609.35	Salvage Existing Stone Curb	LF
R609.36	Concrete Curb	LF
R609.37	Precast Concrete Curb	LF
R609.38	Concrete Curb - Curb Replacement	LF
R610.05	Hydroseeding	SF
R610.06	Seeding	SF
R610.07	Shredded Bark Mulch	CY
R610.08	Pea Gravel	CY
R611.10XX	Deciduous Tree - botanical name - common name	EA
R611.1001	Deciduous Tree - Fraxinus americana "Autumn Purple" - Autumn Purple Ash	EA
R611.1002	Deciduous Tree - Fraxinus pennsylvanica "Marshall's Seedless" - Marshall's Seedless Green Ash	EA
R611.1003	Deciduous Tree - Fraxinus americana "Rose Hill" - Rose Hill White Ash	EA
R611.1004	Deciduous Tree - Fraxinus pennsylvanica "Summit" - Summit Green Ash	EA
R611.1005	Deciduous Tree - Prunus serrulata "Kwanzan" - Kwanzan Cherry	EA
R611.1006	Deciduous Tree - Prunus "Sargentii" - Sargent Cherry	EA
R611.1007	Deciduous Tree - Phellodendron amurense - Amur Cork Tree	EA
R611.1008	Deciduous Tree - Malus "Centurion" - Centurion Crabapple	EA
R611.1009	Deciduous Tree - Malus "Hopa" - Hopa Crabapple	EA
R611.1010	Deciduous Tree - Malus "Radiant" - Radiant Crabapple	EA
R611.1011	Deciduous Tree - Malus "Red Baron" - Red Baron Crabapple	EA
R611.1012	Deciduous Tree - Malus "Royalty" - Royalty Crabapple	EA
R611.1013	Deciduous Tree - Malus "Snowdrift" - Snowdrift Crabapple	EA
R611.1014	Deciduous Tree - Corylus colurna - Turkish Filbert	EA
R611.1015	Deciduous Tree - Ginkgo biloba "Autumn Gold" - Autumn Gold Ginkgo	EA
R611.1016	Deciduous Tree - Ginkgo biloba "Sentry" - Sentry Ginkgo	EA
R611.1017	Deciduous Tree - Celtis occidentalis - Common Hackberry	EA
R611.1018	Deciduous Tree - Crataegus "Lavalle" - Lavalle Hawthorn	EA

ITEM NO.	ITEM	PAY UNIT
R611.1019	Deciduous Tree - Crataegus phaenopyrum - Washington Hawthorn	EA
R611.1020	Deciduous Tree - Gleditsia triacanthos inermis "Shademaster" - Shademaster Honeylocust	EA
R611.1021	Deciduous Tree - Gleditsia triacanthos inermis "Skyline" - Skyline Honeylocust	EA
R611.1022	Deciduous Tree - Carpinus betula "Fastigiata" - Pyramidal European Hornbeam	EA
R611.1023	Deciduous Tree - Tilia cordata "Chancellor" - Chancellor Little-Leaf Linden	EA
R611.1024	Deciduous Tree - Tilia euchlora - Crimean Linden	EA
R611.1025	Deciduous Tree - Tilia cordata "DeGroot" - DeGroot Linden	EA
R611.1026	Deciduous Tree - Tilia cordata "Glenleven" - Glenleven Linden	EA
R611.1027	Deciduous Tree - Tilia cordata "Greenspire" - Greenspire Linden	EA
R611.1028	Deciduous Tree - Tilia tomentosa "Sterling Silver" - Silver Linden	EA
R611.1029	Deciduous Tree - Gleditsia triacanthos inermis "Imperial" - Imperial Locust	EA
R611.1030	Deciduous Tree - Acer rubrum "Armstrong" - Armstrong Red Maple	EA
R611.1031	Deciduous Tree - Acer platanoides "Cleveland" - Cleveland Norway Maple	EA
R611.1032	Deciduous Tree - Acer platanoides "Columnare" - Columnar Norway Maple	EA
R611.1033	Deciduous Tree - Acer platanoides "Crimson King" - Crimson King Norway Maple	EA
R611.1034	Deciduous Tree - Acer platanoides "Emerald Queen" - Emerald Queen Norway Maple	EA
R611.1035	Deciduous Tree - Acer saccharum "Green Mountain" - Green Mountain Sugar Maple	EA
R611.1036	Deciduous Tree - Acer campestre - Hedge Maple	EA
R611.1037	Deciduous Tree - Acer rubrum "Karpick" - Karpick Red Maple	EA
R611.1038	Deciduous Tree - Acer rubrum "October Glory" - October Glory Red Maple	EA
R611.1039	Deciduous Tree - Acer platanoides "Summershade" - Summershade Norway Maple	EA
R611.1040	Deciduous Tree - Quercus rubra - Northern Red Oak	EA
R611.1041	Deciduous Tree - Pyrus calleryana "Aristocrat" - Aristocrat Pear	EA
R611.1042	Deciduous Tree - Pyrus calleryana "Bradford" - Bradford Pear	EA

ITEM NO.	ITEM	PAY UNIT
R611.1043	Deciduous Tree - Pyrus calleryana "Redspire" - Redspire Pear	EA
R611.1044	Deciduous Tree - Pyrus calleryana "White House" - White House Pear	EA
R611.1045	Deciduous Tree - Platanus x. acerifolia "Bloodgood" - Bloodgood London Plane	EA
R611.1046	Deciduous Tree - Eucommia ulmoides - Hardy Rubber Tree	EA
R611.1047	Deciduous Tree - Sophora japonica - Regent Scholar	EA
R611.1048	Deciduous Tree - Amelanchier x. "Robin Hill" - Robin Hill Serviceberry	EA
R611.1049	Deciduous Tree - Amelanchier canadensis - Shadblow Serviceberry	EA
R611.1050	Deciduous Tree - Amelanchier - Springtyme Serviceberry	EA
R611.1051	Deciduous Tree - Zelkova serrata "Green Vase" - Green Vase Zelkova	EA
R611.1052	Deciduous Tree - Zelkova serrata "Village Green" - Village Green Zelkova	EA
R611.1053	Deciduous Tree - Malus "Donald Wyman" - Donald Wyman	EA
R611.1054	Deciduous Tree - Cercidiphyllum japonicum - Katsura Tree	EA
R611.1055	Deciduous Tree - Malus sutyzam - Sugartyme	EA
R611.20XX	Evergreen Tree - botanical name - common name	EA
R611.2001	Evergreen Tree - Pseudotsuga taxifolia - Douglas Fir	EA
R611.2002	Evergreen Tree - Pseudotsuga taxifolia - White Fir	EA
R611.2003	Evergreen Tree - Tsuga canadensis - Canadian Hemlock	EA
R611.2004	Evergreen Tree - Pinus nigra - Austrian Pine	EA
R611.2005	Evergreen Tree - Pinus sylvestris - Scotch Pine	EA
R611.2006	Evergreen Tree - Pinus strobus - White Pine	EA
R611.2007	Evergreen Tree - Picea glauca denoata - Black Hills Spruce	EA
R611.2008	Evergreen Tree - Picea pungeus - Colorado Spruce	EA
R611.2009	Evergreen Tree - Picea abies - Norway Spruce	EA
R611.2010	Evergreen Tree - Picea glauca - White Spruce	EA
R611.30XX	Deciduous Shrub - botanical name - common name	EA
R611.3001	Deciduous Shrub - Myrica pennsylvanica - Northern Bayberry	EA
R611.3002	Deciduous Shrub - Euonymus alata "Compacta" - Dwarf Burningbush	EA
R611.3003	Deciduous Shrub - Aronia melanocarpa - Black Chokeberry	EA
R611.3004	Deciduous Shrub - Cotoneaster apiculatus - Cranberry Cotoneaster	EA
R611.3005	Deciduous Shrub - Cotoneaster divaricatus - Spreading Cotoneaster	EA
R611.3006	Deciduous Shrub - Viburnum trilobum - American Cranberrybush	EA
R611.3007	Deciduous Shrub - Viburnum opulus - European Cranberrybush	EA
R611.3008	Deciduous Shrub - Forsythia suspensa - Weeping Forsythia	EA
R611.3009	Deciduous Shrub - Lonicera xylosteum "Hedge King" - Hedge King Honeysuckle	EA

ITEM NO.	ITEM	PAY UNIT
R611.3010	Deciduous Shrub - Elaeagnus umbellata - Autumn Olive	EA
R611.3011	Deciduous Shrub - Elaeagnus angustifolia - Russian Olive	EA
R611.3012	Deciduous Shrub - Ligustrum amurense - Amur Privet	EA
R611.3013	Deciduous Shrub - Ligustrum obtusifolium regelianum - Regal Border Privet	EA
R611.3014	Deciduous Shrub - Berberis spp - Barberry SPP	EA
R611.3015	Deciduous Shrub - Syringa spp - Lilac SPP	EA
R611.3016	Deciduous Shrub - Philadelphus spp - Mock-orange SPP	EA
R611.3017	Deciduous Shrub - Chaenomeles spp - Quince SPP	EA
R611.3018	Deciduous Shrub - Weigela spp - Weigela SPP	EA
R611.3019	Deciduous Shrub - Rhus aromatica - Fragrant Sumac	EA
R611.3020	Deciduous Shrub - Rhamnus frangula columnaris - Columnar Tallhedge	EA
R611.3021	Deciduous Shrub - Viburnum dentatum - Arrowwood Viburnum	EA
R611.3022	Deciduous Shrub - Viburnum prunifolium - Blackhaw Viburnum	EA
R611.3023	Deciduous Shrub - Viburnum plicatum tomentosum - Doublefile Viburnum	EA
R611.40XX	Evergreen Shrub - botanical name - common name	EA
R611.4001	Evergreen Shrub - Arborvitae occidentalis "Nigra" - Darkgreen Arborvitae	EA
R611.4002	Evergreen Shrub - Arborvitae occidentalis "Techny" - Mission Arborvitae	EA
R611.4003	Evergreen Shrub - Euonymus fortunei "Greenlane" - Greenlane Euonymus	EA
R611.4004	Evergreen Shrub - Ilex crenata - Japanese Holly	EA
R611.4005	Evergreen Shrub - Juniperus sabina "Blue Danube" - Blue Danube Juniper	EA
R611.4006	Evergreen Shrub - Juniperus horizontalis "Wiltonii" - Blue Rug Juniper	EA
R611.4007	Evergreen Shrub - Juniperus chinensis sargentii "Glauca" - Blue Sargent Juniper	EA
R611.4008	Evergreen Shrub - Juniperus chinensis "Glauca Hetzi" - Hetz Blue Juniper	EA
R611.4009	Evergreen Shrub - Juniperus chinensis "Pfitzeriana" - Pfitzer Juniper	EA
R611.4010	Evergreen Shrub - Pinus mugo - Mugo Pine	EA
R611.4011	Evergreen Shrub - Taxus cuspidata capitata - Capital Yew	EA
R611.4012	Evergreen Shrub - Taxus cuspidata mana - Compact Japanese Yew	EA
R611.4013	Evergreen Shrub - Taxus media "Hicksii" - Hicks Yew	EA
R611.50XX	Vines and Ground Cover - botanical name - common name	EA
R611.5001	Vines and Ground Cover - Arctostaphylos uva-ursi - Bearberry	E

ITEM NO.	ITEM	PAY UNIT
R611.5002	Vines and Ground Cover - Coronilla varia - Crownvetch	EA
R611.5003	Vines and Ground Cover - Lonicera japonica "Halliana" - Hall's Honeysuckle	EA
R611.5004	Vines and Ground Cover - Hedera helix baltica - Baltic Ivy	EA
R611.5005	Vines and Ground Cover - Hedera helix - English Ivy	EA
R611.5006	Vines and Ground Cover - Vinca minor - Myrtle	EA
R611.5007	Vines and Ground Cover - Pachysandra terminalis - Pachysandra	EA
R611.5008	Vines and Ground Cover - Vinca minor - Periwinkle	EA
R611.5009	Vines and Ground Cover - Euonymus fortunei "Colorata" - Purpleleaf Wintercreeper	EA
612.01	Sodding	SY
612.0201	Furnishing and Placing Jute Mesh or Other Approved Erosion Control Materials	SY
613.0101	Topsoil	CY
R614.04	Prune Existing Tree	EA
R614.05	Tree Removal - 6" up to 12" DBH	EA
R614.06	Tree Removal - 12" up to 18" DBH	EA
R614.07	Tree Removal - 18" up to 24" DBH	EA
R614.08	Tree Removal - 24" up to 30" DBH	EA
R614.09	Tree Removal - 30" up to 36" DBH	EA
R614.10	Tree Removal - 36" up to 42" DBH	EA
R614.11	Tree Removal - 42" up to 48" DBH	EA
R614.12	Tree Removal - 48" and over DBH	EA
R614.13	Tree Relocation - 1" up to 4" DBH	EA
R614.14	Tree Relocation - 4" up to 8" DBH	EA
R614.15	Prune Existing Plant	EA
R614.16	Plant Removal	EA
R614.17	Plant Relocation	EA
R614.18	Stump Removal - 6" up to 12" Diameter	EA
R614.19	Stump Removal - 12" up to 24" Diameter	EA
R614.20	Stump Removal - 24" up to 36" Diameter	EA
R614.21	Stump Removal - 36" up to 48" Diameter	EA
R614.22	Stump Removal - 48" Diameter and over	EA
R615.05	4" Bollard	EA
R615.06	6" Bollard	EA
R615.07	Pipe Bumper Rail	LF
R615.08	Reset Existing Pipe Bumper Rail	LF
R615.09	Ryerson Edging	LF
R615.10	Timber Curb	LF
R615.11	6" x 6" Timber Bollard	EA
R615.12	8" x 8" Timber Bollard	EA

ITEM NO.	ITEM	PAY UNIT
R615.13	3/8" Galvanized Linked Chain	LF
R615.14	1/2" Galvanized Cable	LF
R615.15	Bench	EA
R615.16	Park Bench	EA
R615.17	Classic Victorian Bench	EA
R616.01	Stone Tree Planter	SF
R616.02	Brick Tree Planter	SF
R616.03XX	X' x X' Frame and Grate Tree Planter	EA
R616.04XX	X' x X' Grate Tree Planter	EA
R616.05	Reset Existing Stone Tree Planter	SF
R616.06	Reset Existing Brick Tree Planter	SF
R616.07	Reset Existing Frame and Grate Tree Planter	EA
R616.08	Reset Existing Grate Tree Planter	EA
618.3101	Asphalt Emulsion (RS-2)	GAL
R619.01	Basic Maintenance and Protection of Traffic	LS
619.02	Construction Signs	LS
619.0413	Type III Construction Barricades	LF
619.0502	Lighting for Construction Barricades	LF
619.13	Temporary Traffic Signals	LS
R622.01	2" Saw Cut - Asphalt	LF
R622.02	2" Saw Cut - Concrete	LF
R622.03	Full Depth Pavement Saw Cut	LF
R624.05	Concrete Gutter	LF
R624.06	Precast Concrete Gutter	LF
R624.07	Concrete Gutter - Gutter Replacement	LF
R626.02	Horizontal Control Survey Monument	EA
R626.03	Vertical Control Survey Monument	EA
R626.04	Adjust Existing Survey Monument	EA
R626.05	Remove Existing Survey Monument	EA
R626.06	New Frame and Cover	EA
R626.07	Reset Existing Frame and Cover	EA
R626.08	Brass Survey Marker Installation	EA
633.0202	Cleaning Existing Pavement and/or Shoulders	SY
633.05	Cleaning, Sealing and Filling Joints and Cracks	LS
634.01	Survey and Stakeout	LS
634.02	Portland Cement	BRL
635.0102	Cleaning and Preparation of Pavement Surface Lines	LF
635.0202	Cleaning and Preparation of Pavement Letters	EA
635.0302	Cleaning and Preparation of Pavement Symbols	EA
637.05	Engineer's Office - Type A	MO
R642.01XX	X" White Paint Pavement Stripe	LF

ITEM NO.	ITEM	PAY UNIT
R642.02XX	X" Yellow Paint Pavement Stripe	LF
R642.03	White Paint Pavement Letter	EA
R642.04	Yellow Paint Pavement Letter	EA
R642.05	White Paint Pavement Symbol	EA
R642.06	Yellow Paint Pavement Symbol	EA
R643.01	Parking Meter Post - Sidewalk Area	EA
R643.02	Parking Meter Post - Over Structure	EA
R643.03	Parking Meter Post - Lawn Area	EA
R643.04	Sign Post Sleeve	EA
645.40	Special Signs and Devices	EA
647.04	Removal and Storage of Signs - Size A (0 to 10 SF)	EA
647.05	Removal and Storage of Signs - Size B (11 to 20 SF)	EA
647.06	Removal and Storage of Signs - Size C (21 to 40 SF)	EA
647.07	Removal and Storage of Signs - Size D (41 to 100 SF)	EA
647.08	Removal and Storage of Signs - Size E (over 100 SF)	EA
R653.01	Fire Alarm Base	EA
R653.02	Reset Existing Fire Alarm Pole	EA
R655.03	Manhole Frame and Cover - Casting	EA
R655.04	Type A Catch Basin Frame and Grate - Casting	EA
R655.05	Type B Catch Basin Frame and Grate - Casting	EA
R655.06	Type A Catch Basin Frame and Grate - Fabricated	EA
R655.07	Type B Catch Basin Frame and Grate - Fabricated	EA
R671.01	Cable	LF
R671.02	3" PVC Conduit	LF
R671.03	3" PVC Conduit - in Roadway	LF
R671.04	3" Galvanized Steel Conduit - in Roadway	LF
R671.05	Replace Existing Conduit with 3" Galvanized Steel Conduit - in Roadway	LF
R671.06	2" PVC Conduit	LF
R671.07	2" PVC Conduit - in Roadway	LF
R671.08	2" Galvanized Steel Conduit - in Roadway	LF
R671.09	Replace Existing Conduit w/ 2" Galvanized Steel Conduit - in Roadway	LF
R671.10	Concrete Pullbox (24")	EA
R671.11	Concrete Pullbox (30")	EA
R671.12	Adjust Existing Concrete Pullbox	EA
R671.13	Relocate Existing Concrete Pullbox	EA
R671.14	Fiberglass Pullbox/Handhole	EA
R671.15	Adjust Existing Fiberglass Pullbox/Handhole	EA
R671.16	Relocate Existing Fiberglass Pullbox/Handhole	EA
R671.17	Metal Pole Base Foundation	EA
R671.18	Metal Pole Base Foundation Extension Adjustment	EA

ITEM NO.	ITEM	PAY UNIT
R671.19	Metal Pole Base Foundation Adjustment	EA
R671.20	Fiberglass Pole Base Foundation	EA
R671.21	Fiberglass Pole Base Foundation Extension Adjustment	EA
R671.22	Fiberglass Pole Base Foundation Adjustment	EA
R671.23	Davit Pole - 20'	EA
R671.24	Davit Pole - 25'	EA
R671.25	Davit Pole - 30'	EA
R671.26	Davit Pole - 35'	EA
R671.27	Davit Pole - 20' Twin	EA
R671.28	Davit Pole - 25' Twin	EA
R671.29	Davit Pole - 30' Twin	EA
R671.30	Davit Pole - 35' Twin	EA
R671.31	Fiberglass Light Pole	EA
R671.32	Luminaire Installation for Fiberglass Pole	EA
R671.33	Luminaire Installation for Metal Pole	EA
R671.34	Relocate Existing Metal Light Pole - Cast-in-place Base	EA
R671.35	Relocate Existing Fiberglass Light Pole - Cast-in-place Base	EA
R671.36	Relocate Existing Metal Light Pole - Precast Base	EA
R671.37	Relocate Existing Fiberglass Light Pole - Precast Base	EA
R671.38	Connection to RG&E Wood Pole	EA
R671.39	Remove Existing Metal Light Pole and Base	EA
R671.40	Remove Existing Fiberglass Light Pole and Base	EA
C676.7006	Mast Arm (Street Light) 6' Length	EA
C676.7008	Mast Arm (Street Light) 8' Length	EA
C676.7010	Mast Arm (Street Light) 10' Length	EA
C676.7012	Mast Arm (Street Light) 12' Length	EA
C676.7014	Mast Arm (Street Light) 14' Length	EA
C676.7016	Mast Arm (Street Light) 16' Length	EA
680.5001	Pole Excavation and Concrete Foundation	CY
680.5002	Concrete Base for Controller Cabinet	EA
680.52XXXX	Conduit - Metal Steel Zinc-Coated X" Diameter	LF
680.53	Conduit Jacking or Boring	LF
680.7001	Single Span Wire Assembly	EA
680.7002	Dual Span Wire Assembly with Upper Tether Wire	EA
680.7003	Dual Span Wire Assembly with Lower Tether Wire	EA
680.7004	Messenger Assembly	LF
680.7005	Guy Assembly	EA
680.7006XX	Riser Assembly - X" Diameter	EA
680.73XXXX	Signal Cable - XX Conductor XX AWG	LF
680.75XXXX	Shielded Communication Cable - XX Pair XX AWG	LF

ITEM NO.	ITEM	PAY UNIT
680.8101	Traffic Signal Section - 12"	EA
680.8102	Traffic Signal Section Optically Programmed - 12"	EA
680.8103	Traffic Signal Section - 8"	EA
680.8111	Traffic Signal Bracket Assembly - 1 way	EA
680.8112	Traffic Signal Bracket Assembly - 2 way	EA
680.8113	Traffic Signal Bracket Assembly - 3 way	EA
680.8114	Traffic Signal Bracket Assembly - 4 way	EA
680.8115	Traffic Signal Bracket Assembly - 5 way	EA
680.8120	Traffic Signal Disconnect Hanger	EA
680.8131	Pedestrian Signal Section - 4-1/2" Letters	EA
680.8132	Pedestrian Signal Section - 3" Letters	EA
680.8141	Pedestrian Signal Bracket Mount Assembly	EA
680.8142	Pedestrian Signal Post Top Mount Assembly	EA
680.82XX	Overhead Sign Assembly - Type XX	EA
680.8220	Flashing Beacon Sign Assembly	EA
680.8230	Fire Pre-Emption Tell Tale Light	EA
C680.9909	Remove Traffic Signal Pullboxes	EA
R685.01XX	X" White Inlaid Plastic Pavement Marking Stripe	LF
R685.02XX	X" Yellow Inlaid Plastic Pavement Marking Stripe	LF
R685.03	White Inlaid Plastic Pavement Marking Letter	EA
C685.03	Sign Post (10')	EA
R685.04	White Inlaid Plastic Pavement Marking Symbol	EA
C685.04	Sign Post (12')	EA
C685.05	Sign Sleeve	EA
R685.05XX	X" White Overlaid Plastic Pavement Marking Stripe	LF
C685.06	Sign Post and Sleeve (10')	EA
R685.06XX	X" Yellow Overlaid Plastic Pavement Marking Stripe	LF
R685.07	White Overlaid Plastic Pavement Marking Letter	EA
C685.07	Sign Post and Sleeve (12')	EA
R685.08	White Overlaid Plastic Pavement Marking Symbol	EA
C685.08	Adjust Frames and Covers (Pull Boxes)	EA
C685.3101	Traffic Sign Size 8" x 24"	EA
C685.3102	Traffic Sign Size 8" x 30"	EA
C685.3103	Traffic Sign Size 8" x 36"	EA
C685.3201	Traffic Sign Size 12" x 18"	EA
C685.3202	Traffic Sign Size 12" x 24"	EA
C685.3203	Traffic Sign Size 12" x 30"	EA
C685.3204	Traffic Sign Size 12" x 36"	EA
C685.3301	Traffic Sign Size 18" x 18"	EA
C685.3302	Traffic Sign Size 8" x 24"	EA
C685.3303	Traffic Sign Size 18" x 30"	EA

ITEM NO.	ITEM	PAY UNIT
C685.3304	Traffic Sign Size 18" x 36"	EA
C685.3401	Traffic Sign Size 24" x 24"	EA
C685.3402	Traffic Sign Size 24" x 30"	EA
C685.3403	Traffic Sign Size 24" x 36"	EA
C685.3501	Traffic Sign Size 30" x 30"	EA
C685.3502	Traffic Sign Size 30" x 36"	EA
C685.3601	Traffic Sign Size 36" x 36"	EA
C685.3602	Traffic Sign Size 36" x 48"	EA
C685.3701	Traffic Sign Size 30" Triangle	EA
C685.3702	Traffic Sign Size 36" Triangle	EA
C685.3801	Traffic Sign Size 30" 5 Sides	EA
C685.3901	Traffic Sign Size 24" Octagon	EA
C685.3902	Traffic Sign Size 30" Octagon	EA
C685.3903	Traffic Sign Size 36" Octagon	EA
C685.3904	Traffic Sign Size 30" Circle	EA
C685.3905	Traffic Sign Size 36" Circle	EA
C685.41	Removal of Signs - Size A (0 to 10 S.F.)	EA
C685.42	Removal of Signs - Size B (11 to 20 S.F.)	EA
C685.43	Removal of Signs - Size D (41 to 100 S.F.)	EA
C685.44	Removal of Signs - Size C (21 to 40 S.F.)	EA
C685.45	Removal of Signs - Size E (Over 100 S.F.)	EA
C685.46	Relocating Signs - Size A (0 to 10 S.F.)	EA
C685.47	Relocating Signs - Size B (11 to 20 S.F.)	EA
C685.48	Relocating Signs - Size C (21 to 40 S.F.)	EA
C685.49	Relocating Signs - Size D (41 to 100 S.F.)	EA
C685.50	Relocating Signs - Size E (Over 100 S.F.)	EA
C686.1611	Maintain Traffic Signal Equipment	INTMO
C686.5099	Concrete Base Removal (Pole or Controller)	EA
C686.71	Shielded Lead-in Cable	LF
C686.72	Inductance Loop Installation and Sealing	LF
C686.7201	Inductance Loop Wire	LF
C686.77	Modify Traffic Signal Equipment	LS
C686.79	Signal Equipment Removal	LS
C686.8026	Pedestrian Push Button with Sign	EA
C686.820030	Mast Arm Traffic Signal Pole Anchor Base (22')	EA
C686.820031	Mast Arm Traffic Signal Pole Combination Anchor Base (30')	EA
C686.830000	Concrete Pole Base Extension	EA
C686.850010	Mast Arm Traffic Signal, 10' Length	EA
C686.850012	Mast Arm Traffic Signal, 12' Length	EA
C686.850014	Mast Arm Traffic Signal, 14' Length	EA

ITEM NO.	ITEM	PAY UNIT
C686.850016	Mast Arm Traffic Signal, 16' Length	EA
C686.850018	Mast Arm Traffic Signal, 18' Length	EA
C686.850020	Mast Arm Traffic Signal, 20' Length	EA
C686.850022	Mast Arm Traffic Signal, 22' Length	EA
C686.850024	Mast Arm Traffic Signal, 24' Length	EA
C686.850026	Mast Arm Traffic Signal, 26' Length	EA
C686.850028	Mast Arm Traffic Signal, 28' Length	EA
C686.850030	Mast Arm Traffic Signal, 30' Length	EA
C686.850032	Mast Arm Traffic Signal, 32' Length	EA
C686.850034	Mast Arm Traffic Signal, 34' Length	EA
C686.850036	Mast Arm Traffic Signal, 36' Length	EA
C686.850038	Mast Arm Traffic Signal, 38' Length	EA
C686.850040	Mast Arm Traffic Signal, 40' Length	EA
C686.850042	Mast Arm Traffic Signal, 42' Length	EA
C686.9916	Coaxial Cable Installation	LF
C686.9917	Removal of Coaxial Cable	LF
C686.9941	Galvanized Steel Pedestrian Signal Pole	EA
C686.994401	Pullbox (24")	EA
C686.994402	Pullbox (30")	EA
C686.9955	Modify Traffic Signal Cable	EA
R687.05XX	X" White Alkyd Thermoplastic Pavement Marking Stripe	LF
R687.06XX	X" Yellow Alkyd Thermoplastic Pavement Marking Stripe	LF
R687.07	White Alkyd Thermoplastic Pavement Marking Letter	EA
R687.08	White Alkyd Thermoplastic Pavement Marking Symbol	EA
C688.620030	Mast Arm Traffic Signal Pole - Embedded (22') (Furnished)	EA
C688.620031	Mast Arm Traffic Signal Pole - Combination - Embedded (30') (Furnished)	EA
C688.802701	Two Phase Semi Actuated Controller (Furnished)	EA
C688.802702	Solid State Modular Controller Assembly, 2 Phase F.T.A. (Furnished)	EA
C688.802704	4 Phase Actuated Ground Mounted Traffic Controller and Cabinet (Furnished)	EA
C688.802708	8 Phase Actuated Ground Mounted Traffic Controller and Cabinet (Furnished)	EA
C688.8028	Loop Detector Module Shelf Mounted (Furnished)	EA
C688.820030	Mast Arm Traffic Signal Pole - (22') (Furnished) (Anchor Base)	EA
C688.820031	Mast Arm Traffic Signal Pole - Combination - (30') (Furnished) (Anchor Base)	EA
C688.8500	Mast Arm (Traffic Signal), Variable Length (Furnished)	EA
C688.991200	Remote Communication Unit (Furnished)	EA

ITEM NO.	ITEM	PAY UNIT
C688.991500	Cable Amplifier (Furnished)	EA
C688.991900	RF Power Splitter or Coupler (Furnished)	EA
C688.992300	Pilot Signal Generator (Furnished)	EA
C688.9942	Steel Span Pole - Anchor Bolt Base (Furnished)	EA
699.04	Mobilization	LS
SECTION R900 WATER FACILITIES		
R901.01XX	X" Ductile Iron Pipe Water Main Class 52	LF
R901.02XX	X" Ductile Iron Pipe Water Main Class 52 (Anchor Pipe)	LF
R901.03XX	X" Ductile Iron Pipe Water Main Class 56	LF
R901.04XX	X" Ductile Iron Pipe Water Main Class 52 (Including Polyethylene Encasement)	LF
R901.05XX	X" Ductile Iron Pipe Water Main Class 52 (Anchor Pipe, Including Polyethylene Encasement)	LF
R901.06XX	X" Ductile Iron Pipe Water Main Class 56 (Including Polyethylene Encasement)	LF
R901.07	Additional Ductile Iron Pipe Fittings	LB
R902.01XX	X" Gate Valve w/ Valve Box - Vertical Type	EA
R902.02XX	X" Gate Valve w/ Valve Box - Horizontal Type	EA
R902.03XX	Salvage Existing X" Valve	EA
R904.01XX	X" x X" Tapping Sleeve and Valve w/ Valve Box	EA
R904.02XX	X" x X" Tapping Saddle and Valve w/ Valve Box	EA
R905.01XX	X" Cutting-In Valve w/ Valve Box and Sleeve(s)	EA
R906.01XX	X" Insertion Sleeve	EA
R907.01	Connect New Water Main to Existing Water Main	EA
R908.01XX	Cut and Plug Existing X" Water Main	EA
R909.01	Furnish and Install New Valve Box	EA
R909.02	Furnish and Install New Valve Box (Including Excavation and Backfill)	EA
R909.03	Furnish and Install New Valve Box (Including Excavation, Backfill and Surface Restoration)	EA
R909.04	Remove Existing Valve Box	EA
R909.05	Remove Existing Valve Box (Including Excavation and Backfill)	EA
R909.06	Remove Existing Valve Box (Including Excavation, Backfill and Surface Restoration)	EA
R909.07	Adjust Valve Box to Grade - Extension Adjustment	EA
R909.08	Adjust Valve Box to Grade - Extension Adjustment (Including Excavation and Backfill)	EA
R909.09	Adjust Valve Box to Grade - Extension Adjustment (Including Excavation, Backfill and Surface Restoration)	EA
R909.10	Adjust Valve Box to Grade w/ Adjustment Rings	EA
R909.11	Adjust Valve Box to Grade w/ Adjustment Rings Furnished by Water Bureau	EA

ITEM NO.	ITEM	PAY UNIT
R909.12	Replace Valve Box Top Section	EA
R909.13	Replace Valve Box Top Section (Including Excavation and Backfill)	EA
R909.14	Replace Valve Box Top Section (Including Excavation, Backfill and Surface Restoration)	EA
R912.01XX	X" Service Tap at Main, Corporation Stop and Connection	EA
R912.02XX	X" Service Tap at Main, Corporation Stop and Connection (Including Excavation and Backfill)	EA
R912.03XX	X" Service Tap at Main, Corporation Stop and Connection (Including Excavation, Backfill and Surface Restoration)	EA
R912.04	Abandon Existing Water Service at Tap	EA
R912.05	Abandon Existing Water Service at Tap (Including Excavation and Backfill)	EA
R912.06	Abandon Existing Water Service at Tap (Including Excavation, Backfill and Surface Restoration)	EA
R913.01XX	New X" Copper Water Service	LF
R913.02XX	New X" Copper Water Service (Including Excavation and Backfill)	LF
R913.03XX	New X" Copper Water Service (Including Excavation, Backfill and Surface Restoration)	LF
R913.04XX	New X" Copper Water Service at Existing Appurtenances	LF
R913.05XX	New X" Copper Water Service at Existing Appurtenances (Including Excavation and Backfill)	LF
R913.06XX	New X" Copper Water Service at Existing Appurtenances (Including Excavation, Backfill and Surface Restoration)	LF
R913.07XX	Extend Existing Service w/ New X" Copper Water Service	LF
R913.08XX	Extend Existing Service w/ New X" Copper Water Service (Including Excavation and Backfill)	LF
R913.09XX	Extend Existing Service w/ New X" Copper Water Service (Including Excavation, Backfill and Surface Restoration)	LF
R914.01XX	Furnish and Install New X" Curb Stop and Box at New Water Service	EA
R914.02XX	Furnish and Install New X" Curb Stop and Box at New Water Service (Including Excavation and Backfill)	EA
R914.03XX	Furnish and Install New X" Curb Stop and Box at New Water Service (Including Excavation, Backfill and Surface Restoration)	EA
R914.04XX	Furnish and Install New X" Curb Stop and Box at Existing Water Service	EA
R914.05XX	Furnish and Install New X" Curb Stop and Box at Existing Water Service (Including Excavation and Backfill)	EA
R914.06XX	Furnish and Install New X" Curb Stop and Box at Existing Water Service (Including Excavation, Backfill and Surface Restoration)	EA
R914.07XX	Furnish and Install New X" Curb Stop	EA

ITEM NO.	ITEM	PAY UNIT
R914.08XX	Furnish and Install New X" Curb Stop (Including Excavation and Backfill)	EA
R914.09XX	Furnish and Install New X" Curb Stop (Including Excavation, Backfill and Surface Restoration)	EA
R914.10	Replace Existing Curb Box Assembly	EA
R914.11	Replace Existing Curb Box Assembly (Including Excavation and Backfill)	EA
R914.12	Replace Existing Curb Box Assembly (Including Excavation, Backfill and Surface Restoration)	EA
R914.13	Adjust Existing Curb Box	EA
R914.14	Adjust Existing Curb Box (Including Excavation and Backfill)	EA
R914.15	Adjust Existing Curb Box (Including Excavation, Backfill and Surface Restoration)	EA
R914.16	Relocate Existing Curb Box Assembly	EA
R914.17	Relocate Existing Curb Box Assembly (Including Excavation and Backfill)	EA
R914.18	Relocate Existing Curb Box Assembly (Including Excavation, Backfill and Surface Restoration)	EA
R914.19	Remove Existing Curb Box Assembly	EA
R914.20	Remove Existing Curb Box Assembly (Including Excavation and Backfill)	EA
R914.21	Remove Existing Curb Box Assembly (Including Excavation, Backfill and Surface Restoration)	EA
R914.22	Adjust Existing Water Meter Box	EA
R914.23	Adjust Existing Water Meter Box (Including Excavation and Backfill)	EA
R914.24	Adjust Existing Water Meter Box (Including Excavation, Backfill and Surface Restoration)	EA
R914.25	Remove Existing Water Meter Box	EA
R914.26	Remove Existing Water Meter Box (Including Excavation and Backfill)	EA
R914.27	Remove Existing Water Meter Box (Including Excavation, Backfill and Surface Restoration)	EA
R915.01XX	Relocate X" Water Service Meter	EA
R916.01XX	X" Temporary Bypass Pipe	LF
R916.02	Temporary Service Connection - 2" and Smaller	EA
R916.03	Temporary Service Connection - Larger than 2"	EA
R916.04	Temporary Fire Hydrant	EA
R917.01	New Hydrant	EA
R917.02	New Hydrant (Including Removal of Existing Hydrant)	EA
R917.03	New Screw-In Type Replacement Hydrant (Including Removal of Existing Hydrant)	EA
R917.04	Relocate Existing Hydrant	EA
R917.05	Remove Existing Hydrant	EA

ITEM NO.	ITEM	PAY UNIT
R917.06	Hydrant Marking Post	EA
R917.07	6" Hydrant Extension Kit	EA
R917.08	12" Hydrant Extension Kit	EA
R917.09	18" Hydrant Extension Kit	EA
R917.10	24" Hydrant Extension Kit	EA