THE CITY OF NEW YORK
DEPARTMENT OF DESIGN & CONSTRUCTION
DIVISION OF INFRASTRUCTURE

Manual for the

Inspection of Distribution Water Main Installation

Training Session No.4:
Distribution Water Main Payments

April 2004

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INTRODUCTION

Since the creation of the Department of Design & Construction, distribution water main installation work has changed in respect to the ongoing evolution of restraint devices (Field Lok gaskets & "wedge type" retainer glands), introduction of resilient wedge gate valves and how contractors procure certain materials due to the changing role of the Department of Environmental Protection's pipe yard operation from citywide supplier of valves, hydrants, and other related appurtenances to a maintenance and repair reserve. In Queens South, the City's takeover of the Jamaica Water Supply system has introduced other issues regarding ownership of services, replacement of deteriorating galvanized steel pipe services to help insure various forms of permanent restoration reach their intended service life and working within a system that had deferred maintenance regularly.

The distribution water main specifications have also been evolving with these changes. Within the next construction season, our Design Division will be releasing a new water main specification that will follow the present sewer specification layout and will bring us closer to our goal of a "unified specification and unit price payment system". The revamped specification will basically remain the same while clearing up some ongoing issues and bringing others into line with how payments are made for similar work in Highway and Sewer related contract items.

The purpose of this manual is manifold:

- Provide a ready-reference for Resident & Office Engineers, both in-house & REI consultant managed projects, to use in preparing distribution water payments. The "Relevant Specification" section contains all pertinent payment language that is normally found throughout the distribution water main specification. The "Sample Payment Calculation" provides a clear example of how an inspector report is broken down into quantities for various payment items.
- Bring uniformity to how quantities are determined, calculated and paid. Presently there are numerous MJ fitting weight charts and spreadsheet programs with questionable accuracy being utilized. The condensed MJ fitting weight table, based on the ANSI/AWWA C110/A21.10-93 "Standard for Ductile-Iron & Gray-Iron Fittings, 3-inch through 48-inch", and EBAA MegaLug weight chart are included in the "Reference Material" section of the manual and are the **City Standard** weights used for payment purposes. Copies of the ANSI/AWWA C110/A21.10-93 "Standard for Ductile-Iron & Gray-Iron Fittings, 3-inch through 48-inch"will be available through the borough offices. The "General Instructions" section provides an overview and tips on how payment quantities are determined. The "Worksheet Instructions" provides a systematic way to determine various pipe furnishing & laying item quantities and MJ fitting weights while allowing for inclusion of theoretical payment quantities for utility interferences.
- Make Resident & Office Engineers aware of how distribution water main offset work quantities for utility interferences are determined and paid. The section entitled, "Determining Theoretical Payment Quantities for Utility Interferences", provides detailed examples showing how to derive the quantities as well as an overview of financial responsibility. This may be one of the areas the City unknowingly overpays contractors enabling private utilities to avoid financial responsibilities imposed on them by legislated cost sharing arrangements or the City's franchise agreement.

Draft copies of the manual have been sent to various sections of the Agency and some contractors for review. The resulting comments have been incorporated in this edition. If you, the user, would like to comment on or make suggestions to improve the future editions of this manual please feel free to contact me.

William Svilar, P.E.
Engineering Specialist

RELEVANT SPECIFICATIONS (as of November 2003)

Excerpts from "Standard Water Main Specifications General Conditions (rev. February 24, 2003)"

Article 8 - Final Payment:
In the estimate of final payment for ductile iron pipe, the length of the new mains laid will be taken as those measured along the axis of the pipes already installed as part of the contract work, irrespective of the number of joints run and made up or caulked in the length, (the laying length of valves shall be included for the purposes of this calculation), to which all shall be added the allowances for special castings installed as stipulated in **Article 28, subparagraph c.** of these General Conditions.

Payment for temporary valves and/or special castings, ordered by the Engineer during the course of the work will be paid for at the same rates as for valves and/or special castings permanently installed. If ordered the by the Engineer, removal of valves and/or special castings, their transfer or disposal, shall be deemed included in the prices bid for various items under this Contract. Compensation for all work as required by the drawings and specifications, or as ordered by the Engineer but not included specifically in the Bid Schedule shall be deemed included in the prices bid for various items under this Contract.

Compensation for Bands, Rods, Washers, Nuts And Bolts, etc.: Payment for furnishing, delivering and installing bands, rods, washers, nuts and bolts, and all others materials required to restrain pipe joints that are ordered by the Engineer to protect against unbalanced pressures will be made to the Contractor at the unit prices for that item in the Bid Schedule.

Compensation for Additional Excavation: When the trench excavation is included in the "Laying Pipe" bid item contained in the Bid Schedule and additional excavation outside of or within the specified trench limits is required or ordered, payment for such excavations, unless otherwise specified, shall be made under the Bid Item "Excavation Required Outside the Pipe Trench" contained in the Bid Schedule. These excavations include, but are not limited to the following purposes:

> **(d)** Where the mains are ordered to be laid at a depth which will make the cover on the top of the barrel of the pipe greater by a minimum of one (1) foot (0.3 m.) that is shown on the drawings or required in the opinion of the Engineer.

The price bid for this item shall include the removal and disposal of excavated material determined by the Engineer to be unsatisfactory for backfill purposes.

Article 28, subparagraph c. - Length of Ductile Iron Pipe for Purposes of Calculating Payments:
The Contractor's attention is called to the fact that the various estimated lengths of ductile cast iron pipe given in the items for laying pipe of different diameters as listed in the Schedule of Bid Prices include, in addition to the lengths as measured along the axis of the pipes, estimated lengths based upon the following allowances for special castings:

RELEVANT SPECIFICATIONS (as of November 2003)

Article 28, subparagraph c. (cont'd):

Allowances for Cast Iron Special Castings, Twenty-Four (24) Inches (600 mm.) and Smaller, as Provided in Article 8 of the Standard Water Main Specification General Conditions:

Table 1 – Bell and Spigot, Lead Joint Fittings

For each bend, cap, plug or reducer	Five (5) feet (1.5 m.) of pipe
For each three-way, offset, Sleeve or double hub	Ten (10) feet (3.0 m.) of pipe
For each four-way	Fifteen (15) feet (4.5 m.) of pipe
For each sleeve to connect existing HPFS mains to new ductile iron pipe	Six (6) feet (1.8 m.) of pipe

Table 2 – Mechanical Joint Fittings

For each, cap or plug	One (1) feet (0.3 m.) of pipe
For each bend, reducer, offset, or sleeve	Two (2) feet (0.6 m.) of pipe
For each three-way	Three (3) feet (0.9 m.) of pipe
For each four-way	Four (4) feet (1.2 m.) of pipe

The larger size of reducers and the size of the run on three-ways and four-ways shall be used as the basis of payment.

Payment for new pipe furnished and installed shall be made at the established unit prices bid for the actual footage of pipe, as measured along the axis of the pipes in place.

The laying length of surplus pipe returned to the Department of Environmental Protection's storage yard shall be measured from the face of the spigot to the inside shoulder of the bell (or hub).

Article 37 – Ductile Iron Pipe, Fittings and Special Castings Furnished by the Contractor:
Payment for new pipe furnished and installed shall be made at unit prices bid by the Contractor for the actual footage of pipe, as measured along the axes of the straight pipes in place plus the applicable allowances for special castings.

RELEVANT SPECIFICATIONS (as of November 2003)

Article 37 (cont'd):
The Contractor shall furnish all bends, 3-ways, 4-ways, caps, offsets, plugs, reducers and sleeves required to install the water mains under this Contract. The fittings shall be complete with all accessories, including wedge type retainer glands.

Where due to pressure conditions and restraint requirements installation of double retainer glands is necessary, payment for installation of additional retainer glands shall be included in the prices bid for various items under this Contract.

For method of payment, see Specifications for Ductile Iron Pipe with Push-on Joints and Gray Iron and Ductile Iron Fitting with Mechanical Joints, 6 through 48 inches (150 mm. through 1200 mm.) in Diameter; Section B7 - measurement for payment.

Excerpts from "Specifications for Ductile Iron Pipe with Push-on Joints and Ductile Iron Fittings with Mechanical Joints, 6 through 48 inches in Diameter (Rev. February 1998)"

Section B7 - Measurement for Payment (when fittings are not furnished by the City):
The quantity to be paid shall be the weight in tons as follows:

Fittings: the weight for payment shall be based on the bare weight weights listed in the latest addition of ANSI/AWWA C-110/A21.10-93, for ductile iron fittings only.

Bolts, nuts and gaskets shall be considered as having been included in the price stipulated for the fittings.

Wedge Restraint Glands: For fittings or rodding purposes shall be paid for in accordance with their weight as listed in the latest edition of EBAA Iron, Inc., Eastland, Texas 76448, catalog for MegaLug restraint glands

Excerpts from "Standard Specifications for Cast Iron Castings (Rev. December 1999)"

VIII. Section 5 TOLERANCES FOR VALVE BOX CASTINGS

The allowable variations from the standard weight shall be as follows:

Section 5.1 SUB STANDARD WEIGHT: Valve box castings that fall below the "Standard Weight" by more than the permissible variation** will not be accepted.

Section 5.2 EXCESS WEIGHT: Valve box castings which exceed the "Standard Weight" by more than 5 percent, will be accepted on the basis of the "Standard Weight" plus this allowable percentage.

Section 5.3 ACTUAL WEIGHT: EXCESS WEIGHT: Valve box castings, the weights of which fall within permissible variations, shall be accepted on the basis of actual weight.

** The permissible weight variation varies based on the actual casting being considered. A condensed chart referencing the standard drawings, standard weights, maximum weights and minimum weights is available in the reference material section.

RELEVANT SPECIFICATIONS (as of November 2003)

Excerpts from "EP-7 Gas Cost Standard Specifications"

II-General Provisions, Gas Cost Sharing
2.Water main Accommodations

When water main construction is to be performed in this contract, Contractor shall be required, if warranted by field conditions, and at locations designated by the Engineer, to change the vertical or horizontal alignment of water mains including but not limited to all additional labor, furnishing, delivering, and laying offset fittings and pipes necessary in order to complete water main installation and, avoid gas interferences in the project area, including street intersections. Such work shall be performed as directed by the Engineer and in accordance with contract specifications and latest edition of water mains standards and specifications. The portion of EP-7 bid item GCS-2 "Water Main Accommodations" (F.S. Fixed Sum) to be paid shall be computed by applying unit prices bid for appropriate water main work items to the quantity of work performed, as determined by the Engineer. When EP-7 bid item GCS-2 does not exist, such additional water main accommodation work shall be at no cost to the City but shall be a matter of adjustment between gas facility operator and contractor. Private facilities, other than gas, that become in interference with re-aligned water mains shall be accommodated, if so directed by the Resident Engineer, at no additional cost to the City and, provided that its owner agrees to be responsible for all additional costs to the contractor, otherwise, such facility shall be ordered by the City to be maintained, shifted, relocated or replaced by its owner at his/her expenses.

GENERAL INSTRUCTIONS

The following is a list of commonly encountered water main payment items and a brief explanation as to how the item is normally applied for payment. There are other water main items that may be included in your contract covering specific conditions work may required to be performed under. Consult the specifications for a detailed explanation on any of these payment items as this manual is not intended to address all conditions encountered.

Furnishing & Delivering Ductile Iron Restrained Joint Pipe or Pipe (Sizes: 6-inch thru 24-inch):
The basic pipe provided in this category is Tyton or push on joint pipe. Restraint is normally provided by the use of a Field Lok gasket or a restraint system such as TR-Flex, Snap Ring or Super Lok. Payment is based on lineal feet (LF) measured of furnished pipe excluding bells and overlaps.

Furnishing & Delivering Ductile Iron Mechanical Joint Fittings w/ Wedge Type Retainer Glands (Sizes: 6-inch thru 24-inch):
This item provides reimbursement by bare weight as provided by the ANSI/AWWA C110/A21.10 standard for all types of mechanical joint fittings. Wedge type retainer glands are reimbursed by weight as provided by the Ebaa Iron for MegaLugs wedge type retainer glands as well. Although this method of payment can be tedious to calculate, a single item provides a means to pay for over fifty types of fittings.

Laying Ductile Iron Pipe & Fittings (Sizes: 6-inch thru 24-inch):
This item provides for the excavation, pipe & fitting installation, sanitizing the water main, backfilling, placing temporary pavement (unless other payment means are defined & provided), etc. Payment is made in lineal feet (LF) measured excluding bells and overlaps of pipe and fittings. To this measured length an allowance for fitting installation is added. Remember, the larger size of reducers and the size of the run on three-ways and four-ways shall be used as the basis of payment in determining the size the lay lengths and allowances are to be paid under.

Furnishing, Delivering & Installing Bands, Rods, Washers, Etc., Complete for Restraining Joints:
This item provides reimbursement for furnishing and installing "rods & bands" to restrain existing pipe to new pipe at a tie-in point dependent on field conditions. Weights of various size bands, rods, nuts and washers are listed in Standard Drawing Nos. 10238-A-Z and 20731-Z-C. Payment is provided by weight for "rods & bands" furnished and installed.

Furnishing, Delivering & Installing (Sizes: 6-inch thru 20-inch) Mechanical Joint Ductile Iron Gate Valve Complete With Wedge Type Retainer Glands:
The item also includes the installation of a main line valve box (MLVB) consisting of a manhole skirt, head & cover and concrete blocks as required. Payment is provided on a unit basis by size.

Furnishing & Delivering Various Castings Including But Not Limited To 24-inch Manhole Skirts, Heads & Covers, And Hydrant Valve Box, Etc.:
This item provides reimbursement for furnishing various cast iron castings by weight in accordance to limitations established by the specification.

Furnishing & Delivering Hydrants:
The City specifies the use of two types of low pressure hydrant patterns originally produced by Dresser (D2LP) and A.P. Smith (S2LP). Smith pattern hydrants are normally provided for work performed in designated Historic Districts. Payment is provided on a unit basis.

GENERAL INSTRUCTIONS

Setting Hydrants Complete With Wedge Type Retainer Glands:
The item includes the installation of the cast iron drain basin, furnishing and installing the ¾ -inch diameter copper tubing drain and the brass flared x threaded connector. Payment is provided on a unit basis. Please note that furnishing wedge type retainer glands are included under this item and no separate payment should be made. Payment of concrete collars is dependent on the type of contract the water main installation is being performed under, if an applicable item is not provided such work can be inclusive. Read the pertinent specification to determine what applies on your contract. Payment is provided on a unit basis.

Furnishing, Delivering and Installing Hydrant Fenders:
This item includes concrete required to fill the fenders, furnishing caps, securing them in place with a drilled pin or by a welding bead and painting. Payment of concrete collars is dependent on the type of contract the water main installation is being performed under, if an applicable is not provided such work can be inclusive. Read the pertinent specification to determine what applies on your contract. Separate payment items are included in the contract for furnishing fenders with decorative caps. Payment is provided on a unit basis.

Removal of Low Pressure Hydrants:
The item requires the complete removal of the hydrant (including the buried portion and drain basin). Payment is provided on a unit basis.

Furnishing & Placing Sheeting & Bracing For (Sizes 6-inch thru 24-inch) Water Main Trench:
Typically water main less than 16-inches in diameter are installed at cover that makes the overall trench depth less than or equal to 5 feet. When the soil is stable in these instances sheeting may not be required and such a decision must be made by the contractor's designated competent person. Therefore, when pipe 16-inch in diameter or larger and when any pipe size installation requires an overall depth of exceeding 5 feet, the contractor must sheet and brace the trench to provide protection for men assembling the pipe. Payment for provided sheeting provided in square feet measured from grade to the top of the pipe (cover) to which the nominal OD of the pipe is added plus 6-inches.

Withdraw & Replacing House Services Using (Sizes: Smaller Than 1½-inch / 1½-inch Or Larger) Screw Taps:
The item includes the copper swing and coupling provided in a basic tap reconnection. Two payment items that are differentiated by size are provided when required. Payment is provided on a unit basis.

Furnishing, Delivering & Installing Wet Connection Sleeve On (Sizes: 6-inch thru 24-inch) Pipe With Various Outlets:
The item is differentiated by the pipe size the sleeve was designed to encircle regardless of the outlet size. The item includes coordination of the cut with DEP maintenance personnel through the Resident Engineer's office. If the cut is to be made in the trench, an excavation with limits based on Standard Drawing No. 39674-Z, must be provided and is inclusive in this item. Payment is provided on a unit basis by size.

Furnishing, Delivering & Installing (Sizes: 3-inch thru 12-inch) Wet Connection Valves Complete With Wedge Type Retainer Glands:
The item also includes sandbags to support the valve, flange bolts and a flange gasket. Payment is provided on a unit basis by size.

GENERAL INSTRUCTIONS

Extending House Services (Sizes: Pipe Less Than 3-inch Dia. / Pipe Equal Or Greater Than 3-inch Dia.):
This item is subdivided further by pipe size grouping. This item is strictly to pay for extension of water services or replacement of defective services as directed by the Engineer. When water main is laid in different lane from the existing, the services requiring extension are paid for under this item and the paid length is equal to the centerline difference between the water main lanes. This item is also used to replace failing galvanized services in the former Jamaica Water Supply Area. Payment is provided on a lineal foot basis (LF) and includes all couplings required for a complete job.

Pavement Excavation:
Payment under this item is provided on a conditional basis depending on the composition and thickness of the existing pavement. Form No.5, Section 5.20 addresses these parameters. The width of excavation is determined by the nominal pipe diameter and if the trench is unsheeted or sheeted. Payment is provided by cubic yards (CY) measured in place. Payment for pavement excavation is dependent on the type of contract the water main installation is being performed under, if an applicable item is not provided such work can be inclusive or paid under a different item. Read the pertinent specification to determine what applies on your contract.

Excavation Required Outside The Pipe Trench (Including the Excavation and Disposal of Pavement):
This item is to provide compensation for digging test pits to locate pipe ends, service taps and for instances where a water main is installed at a cover at least one foot deeper than normal (or is excessive in the opinion of the Engineer). Other conditions may apply for payment. Consult the specifications to determine if these restrictions apply. Payment is provided by cubic yards (CY) measured in place.

Furnishing, Delivering & Placing Satisfactory Backfill Material:
This item is to provide compensation for fill provided to replace existing native material that is unsuitable for use as backfill material in a water main trench for the layer of fill located above the clean sand envelope up to grade. Payment is provided by cubic yards (CY) measured in place.

GENERAL INSTRUCTIONS

ADDITIONAL TIPS

- Before proceeding with the preparation of any distribution water main payment, it is good practice to review the contract specifications' addenda that attaches or references the Standard Water Main Specifications. The addenda, particularly the sheets preceding the Standard Water Main Specifications General Conditions, addresses deviations from how items of work are commonly paid. For example, a pavement excavation item normally associated with the WM-1 budget line can be eliminated under a highway project. Pavement excavation would be paid under an item known as 4.02CB "Unclassified Excavation" without restrictions. The addenda can eliminate payment items by stating: "payment for such as including all costs associated with pavement excavation are to be included in the respective water main laying items". The addenda can also modify specifications to make it more inclusive by stating: "replacement of galvanized services, as directed by the Engineer, will be paid under the service extension item of the appropriate size.

WORKSHEET INSTRUCTIONS

1. Inspectors should be instructed to measure every length of pipe installed from the edge of the spigot end to the inside shoulder of the bell or hub. Basically, the entire length can be measured and the depth of the bell or hub deducted before recording the pipe length to the nearest inch in the daily report. The specification requires measured payment along the axes of the pipe irrespective of the number of joints.

2. It is much more efficient to insert data into the table from a pictorial record and perform these calculations. Drawing the field cards prior to or in conjunction with the performance of these calculations allows the preparer to visualize the installation, catch errors and obtain clarification from field personnel before the work fades from memory. Even sketches are preferable to just listing the pipe measurements and fittings into a worksheet from a daily report.

3. Write the date the appurtenance was installed in column A, write the length of pipe installed in column B or the type of fitting installed in column C1. Each pipe length or fitting should be represented on a single line. Complete entering the entire day's work into the worksheet. A worksheet represents a single size of pipe. Entry of a single day of work may require more than one worksheet.

4. Using the condensed tables located in the Reference Material section or the ANSI/AWWA C110/A21.10-93 "Standard for Ductile-Iron & Gray-Iron Fittings, 3-inch through 48-inch", locate the fittings' listed on the worksheet. Insert the bare weights (in lbs) in column C2 and the total lay length of the fitting in column C3. *Remember*, the larger size of reducers and the size of the run on three-ways and four-ways shall be used as the basis of payment. For example: the lay length of a 12-inch 45-degree MJ Bend is 1.25 feet (15 inches) and is reported on 12-inch pipe worksheet, the lay length of 20x6 MJ Three-way is 3.75 feet (45 inches) and is reported on 20-inch pipe worksheet.

5. Enter the fitting allowance as specified in Article 28, subparagraph c. of the Standard Water Main Specifications General Conditions in column C4 for each listed fitting.

6. Determine the no. of each size of wedge type retainer gland (WRG) required for each listed fitting and enter the data in column D1. Determine the total weight of wedge type retainer glands used for the fitting and enter the weight (in lbs.) in column no. D2. For example: a 20x6 MJ Three-way requires 2/20-inch and 1/6-inch WRG for a total weight of (2 x 74.50 lbs + 1 x 12.00 lbs) or 161.00 lbs. The condensed weight table provides the total weight of wedge type retainer glands used for specific fittings, or use the Ebaa Iron weight chart to obtain individual weights of the wedge type retainer glands used and calculate a total weight.

7. If the listed pipe or fitting was used in performance of a utility offset, separate calculations will be needed to determine theoretical payment quantities or if applicable, the entire payment will be determined in dollars and paid under an EP-7 Gas Cost Sharing Item. Examples of utility offset calculations are included in a separate section in this manual.

8. Column F represents the Furnish & Deliver Ductile Iron Pipe Item for its respective pipe size. An entry in column E2 supersedes all other entries for the line item as it represents a theoretical payment, record the same entry from column E2 into column F and skip to the next instruction. If there is no entry in column E2, record the entry in column B into column F and skip to the next instruction. If there is no entry in column B, enter "0" in column F.

WORKSHEET INSTRUCTIONS

9. Column G represents the Laying Pipe & Fitting Item for its respective pipe size. An entry in column E3 supersedes all other entries for the line item as it represents a theoretical payment, record the same entry from column E3 into column G and skip to the next instruction. If there is no entry in column E3, record the sum of the line entries in columns B, C3 & C4 into column G.

10. Column H represents the Furnish & Delivery of Mechanical Joint Fitting Item for this respective pipe size only. An entry in column E4 supersedes all other entries for the line item as it represents a theoretical payment, record the same entry from column E4 into column H and skip to the next instruction. If there is no entry in column E4, record the sum of the line entries in columns C2 & D2 into column H.

11. Summing up column F & G would yield the Furnish & Deliver Ductile Iron Pipe and Laying Pipe & Fitting Item totals for the days work in each respective pipe size. These totals can be placed in the payment book and worksheets included as backup.

12. Summing up column H on each respective pipe size worksheet and adding these results would yield the Furnishing & Delivery of Mechanical Joint Fitting Item total for the days work in lbs. Do not forget to divide by 2000 lbs/ton before entering it into the payment book.

WORKSHEET INSTRUCTIONS

ADDITIONAL TIPS

- When determining lay lengths of pipe and mechanical joint fittings, a good rule of thumb is that the exclusion of overlaps (joints, sleeves) is mandatory in these calculations. This rewards Contractors that install water mains with the least amount of joints and forces a form of efficiency on them.

- Mechanical joint sleeves of any size have no lay length as they basically perform as an oversized bell, and joints/overlaps are not paid for. Sleeves are basically paid for under the Furnishing & Delivery of Mechanical Joint Fitting Item along with the appurtenant wedge type retainer glands and a laying allowance.

- Line entries for Mechanical joint gate valve should be made in column C1. The only other entry for gate valves should be a lay length in column C3. Valves have no laying allowances. Weights for wedge type retainer glands for gate valve installations are not paid but are inclusive in the valve furnishing items.

- Temporary Cap assemblies (comprising of a cap, a small piece of pipe and rods & bands for restraint purposes) and Temporary Plugs should be paid for once under the appropriate furnishing items (pipe & fitting) as they are commonly reused and each time they are used under the appropriate laying item. Although the temporary work will not be part of the system when completed, the material is repeatedly exposed to high concentrations of chlorinated water which shortens their usefully life and are typically replaced from job to job.

- A final quantity check can be performed by physically measuring between known points (such as hydrants and main line valves) and adding calculated lengths for tie-ins and offsets for final quantities. This procedure usually eliminates full pipe length count discrepancies.

- The Reference Material section of this manual contains a condensed table of lay lengths and allowances as defined by Article 28 of the "Standard Water Main Specifications General Conditions" for commonly used standard and non-standard ANSI/AWWA C-110/A21.10 specification. If you cannot find the fitting used in the condensed table consult a copy of the ANSI/AWWA C110/A21.10 "Standard for Ductile-Iron & Gray-Iron Fittings, 3-inch through 48-inch" to determine the fittings lay length. The ANSI/AWWA C-110/A21.10 specification has no standard for mechanical joint offset (OS) fittings over 16-inch in diameter and for offsets greater than 24-inches (i.e. 12x24 OS, 8x24 OS & 6x24 OS). These larger offsets can be fabricated using two bends (of equal size) and a piece of pipe. Dimensions & weights can differ for non-ANSI/AWWA standard offsets of the same size. In these instances, the basic dimensions should be checked against the manufacturer's standard and the furnished bare weight used if the dimensions match for payment purposes. The shipping weight for a non-standard item can be used as a last resort.

- Presently we accept four sources for wedge type retainer glands:
  RomaGrip by Romac Industries, Inc.
  MegaLug by Ebaa Iron
  OneLok by SigmaCorporation
  Uni-Flange by Ford Meter Box Company, Inc.

  No matter what is provided, MegaLug, by Ebaa Iron, weights for the respective size wedge type retainer glands are used for payments.

Distribution Water Main Payment Calculation Worksheet

Contract No.:____________________ Prepared By:____________________ Date:__________

Nominal Pipe Size:__________ Checked By:____________________ Date:__________

Date	DIP Straight (LF)	Pipe Fittings & Wedge Type Retainer Glands						Utility Offset – Theoretical Work				F/D DIP (LF)	Lay (LF)	F/ MJ Fittings & WRG (lbs)
		Mechanical Joint Fitting Description	Bare Fitting Wt. (lbs)	Fitting Lay Length (LF)	Allowance (LF)	Wedge Type Retainer Glands (No./Size)	Total WRG Wt. (lbs)	Utility Co.	F/D DIP (LF)	Lay (LF)	F/ MJ Fittings & WRG (lbs)			
A	**B**	**C1**	**C2**	**C3**	**C4**	**D1**	**D2**	**E1**	**E2**	**E3**	**E4**	**F**	**G**	**H**

EXAMPLES OF THEORETICAL PAYMENTS FOR UTILITY INTERFERENCES

General:

Utility Offsets usually fall into four basic categories:

1. Horizontal Offset
2. Vertical Offset
3. Equivalent Fitting Offset
4. Combinations (of the above categories)

Payment for Utility offsets fall into two categories: Section "U" and Cost-Sharing.

Section "U" Utility Offsets:

Section "U" deals with Con Edison (steam & electrical), Verizon, AT&T, Cable TV and other non-gas related private utilities. Section "U" utility offsets deal with theoretical pipe layouts and payments. Had the interfering utility not existed what would the most logical pipe layout be. From this layout the theoretical payment quantities would be determined and inserted into column nos. E2, E3, & E4.

Example No. 1 (Horizontal Offset): The sketch represents a horizontal offset for a Con Edison electric facility requiring the use of four 12-inch 45-degree mechanical joint bends (MJ 12/45°) with appurtenances and 18'-0" of 12-inch pipe. Had the interference not been present the installation would have required 17'-9" of 12-inch pipe to be installed.

Example No. 2 (Vertical Offset): The sketch represents a vertical offset for a shallow Verizon duct bank requiring the use of two 12x18 mechanical joint offsets (12x18 OS) with appurtenances, 4'-0" of 12-inch pipe. Had the interference not been present the installation would have required 12'-0" of 12-inch pipe to be installed.

Example No. 3 (Equivalent Fitting Offset): The sketch represents a horizontal offset for a Verizon facility requiring the use of two 12-inch 45-degree mechanical joint bends (MJ 12/45°) with appurtenances, the installation of two 12x12 mechanical joint three-ways (MJ 12x12 3W) in lieu of a single 12x12 mechanical joint four-way (MJ 12x12 4W) with appurtenances and 14'-3" of 12-inch pipe. Had the interference not been present the installation would have required one MJ 12x12 4W with appurtenances and 16'-2" of 12-inch pipe to be installed.

Most horizontal offsets are identified and accommodated during the Design Phase of the project through alignment meetings held with the private utility companies. Payment is provided directly to the City for accommodation work identified during the Design Phase and subsequently included in the contract. Example Nos. 1 & 3 are to be used when field conditions dictate necessary changes from the contract plans.

EXAMPLES OF THEORETICAL PAYMENTS FOR UTILITY INTERFERENCES

Cost-Sharing Utility Offsets:

The cost-sharing concept primarily applies to water main offsets for gas facilities owned and operated by a private utility company. Depending on the location of work, the ownership varies between Con Edison and Keyspan (B.U.G.). Basically, a fix sum item entitled, GCS-2: "Water Main Accommodations" is included in the contract under the EP-7 budget line. The sketch of the theoretical work is to be used to determine a starting and ending point of the accommodation work. Determining theoretical payment quantities is not required, since the costs are shared. Enter the quantity of "0" into column nos. E2, E3, & E4. No payment for gas facility accommodation work is to be made under the distribution water main bid items. Once the actual quantities for the water main offset work performed for a gas utility are determined. Each calculated quantity is then multiplied by their respective unit prices and summed to obtain a total cost in dollars. This amount is then included in the GCS-2: "Water Main Accommodations" item for payment. Financial responsibility for quantities paid under the EP-7 budget line will be shared between the City and the respective gas utility at legislated percentages.

For Example Nos. 4 & 5, the following Unit Prices are being used for the sample calculations:

Furnish & Deliver 12-inch Restrained Joint Ductile Iron Pipe	$22.00 / LF
Lay 12-inch Ductile Iron Pipe & Fittings	$40.00 / LF
Furnish Mechanical Joint Fitting & Wedge Type Retainer Glands (All Sizes)	$3,750.00 / Ton
Excavation Outside Trench Limits	$25.00 /CY

Example No. 4 (Vertical Offset): The sketch represents a vertical offset for a Con Edison gas facility requiring the use of four 12-inch 45-degree mechanical joint bends (MJ 12/45°) with appurtenances and 8'-8" of 12-inch pipe. The total cost of the accommodation or offset work, $3,190.96, is to be charged to the EP-7 item GCS-2: "Water Main Accommodations".

Example No. 5: (Equivalent Fitting Offset): The sketch represents a horizontal offset for a Keyspan gas pressure regulating facility requiring the use of two 12-inch 45-degree mechanical joint bends (MJ 12/45°) with appurtenances, the installation of two 12x12 mechanical joint three-ways (MJ 12x12 3W). The total cost of the accommodation or offset work, $4,714.92, is to be charged to the EP-7 item GCS-2: "Water Main Accommodations".

Most horizontal offsets for gas facilities are identified and accommodated during the Design Phase of the project through alignment meetings held with the private gas utility companies. Conditions requiring the accommodation pictured in Example No. 5 are normally addressed during the Design Phase. However, the example's situation can be real if field conditions dictate necessary changes from the contract plans and demonstrates how to calculate and apply a charge to the EP-7 item GCS-2: "Water Main Accommodations".

EXAMPLES OF THEORETICAL PAYMENTS FOR UTILITY INTERFERENCES

ADDITIONAL TIPS

- In instances when the contractor is required to excavate deeper to install a water main offset for a gas facility, the contractor maybe entitled to additional payment under various excavation items such Additional Excavation Outside Trench Limits, Tight Sheeting and Special Care Excavation. In addition for pipe covers over 7'-0", the contractor maybe entitled to additional payment for the cost of encasing the water main in concrete.

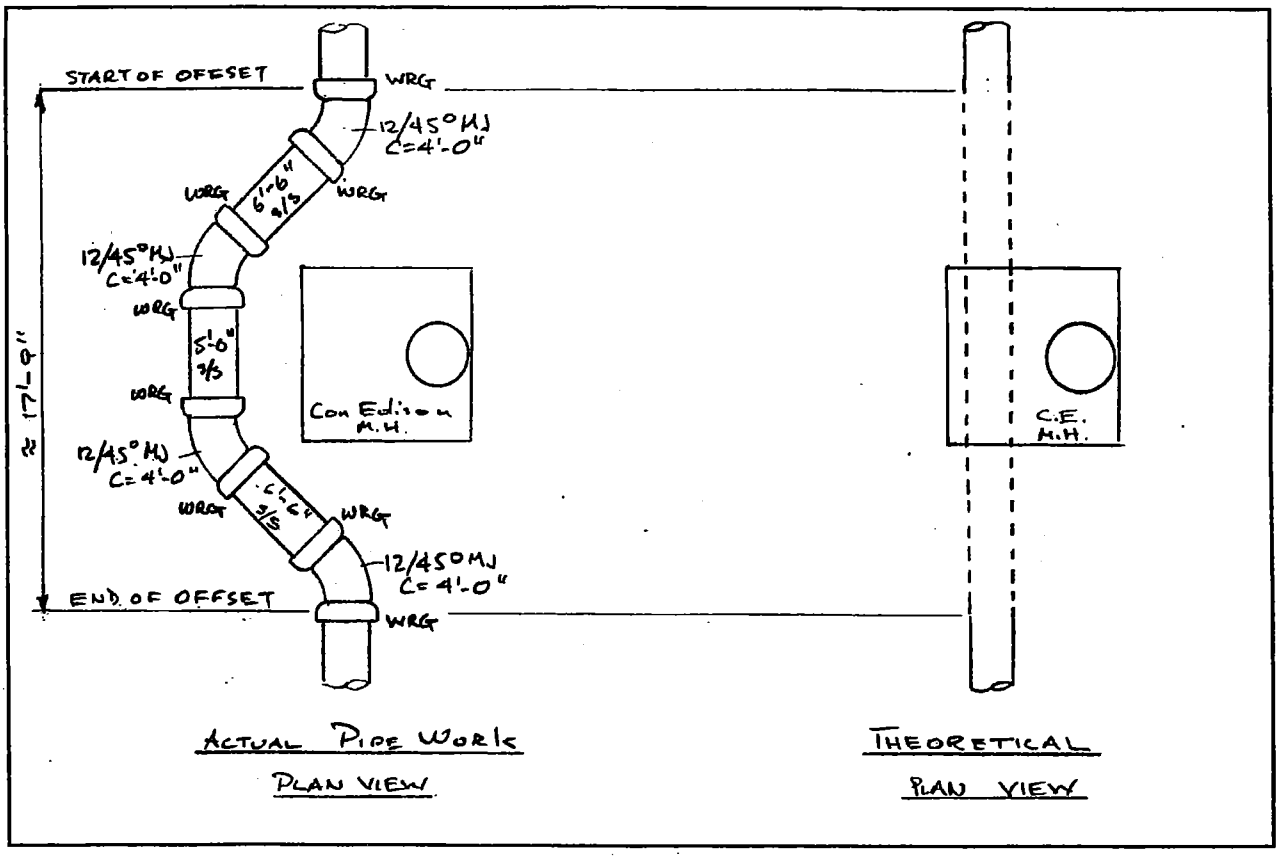
- The utilities and contractors may apply a "first interference rule" to determine who is responsible for water main offset costs. In order not to be involved in a double pay situation, clarification from the contractor and utility owner/operator may be required to determine financial responsibility before determining payment.

- The examples provided do not cover all the situations encountered. Consulting with your supervisor, the contractor and utilities involved may be necessary.

- Detailed sketches showing the work performed and the theoretical layout will help you determine what is or isn't solely the City's financial responsibility and perform the necessary calculations. This will help the auditor review your work without seeking further clarification.

EXAMPLES OF THEORETICAL PAYMENTS FOR UTILITY INTERFERENCES

Example No. 1 (Horizontal Offset):

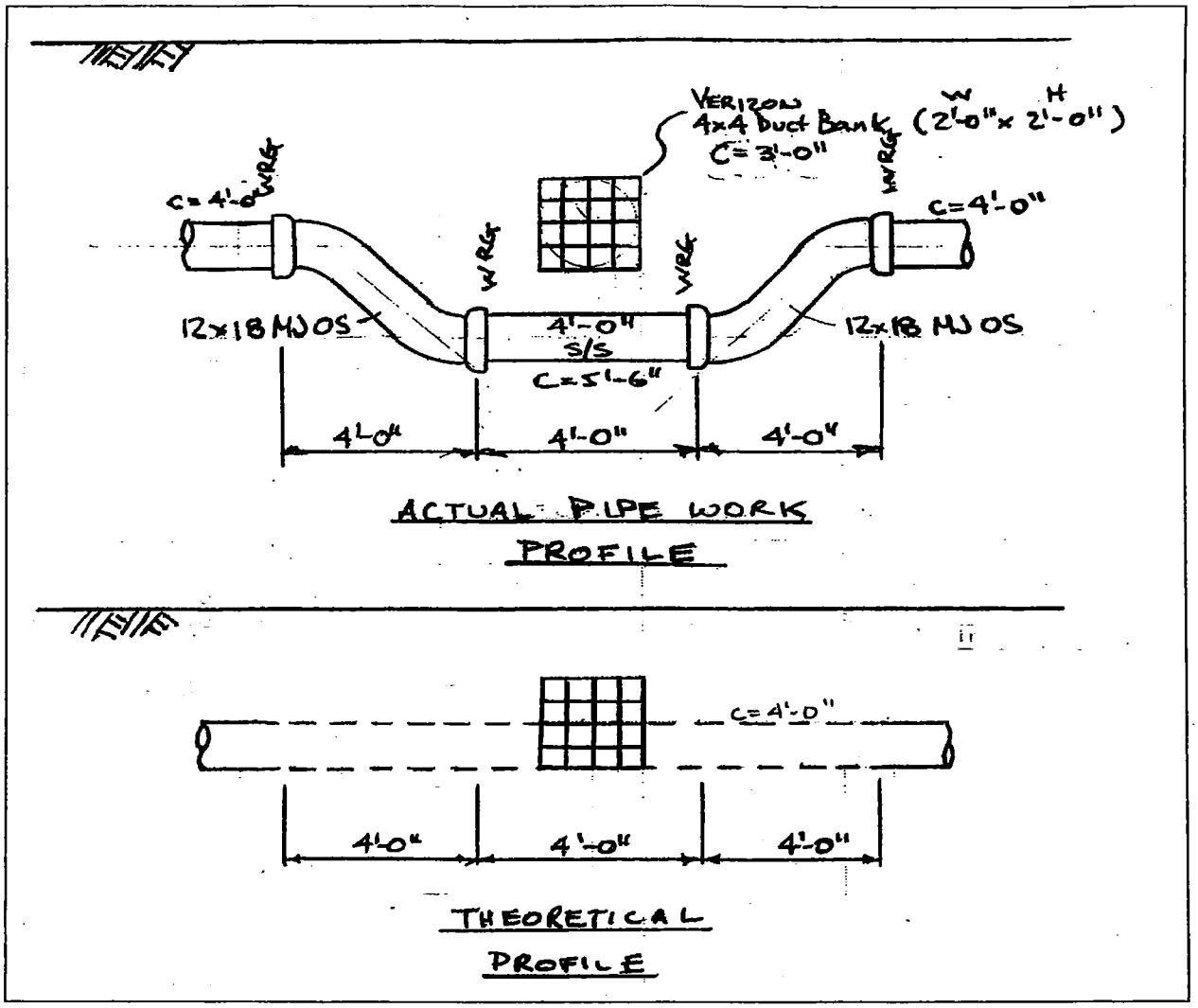


WORKSHEET ENTRIES:

DIP Straight (LF)	Pipe Fittings & Wedge Type Retainer Glands						Utility Offset - Theoretical Work			
	Mechanical Joint Fitting Description	Bare Fitting Wt. (lbs)	Fitting Lay Length (LF)	Allowance (LF)	Wedge Type Ret.Glands (No./Size)	Total WRG Wt. (lbs)	Utility Co.	F/D DIP (LF)	Lay (LF)	F/ MJ Fittings & WRG (lbs)
B	C1	C2	C3	C4	D1	D2	E1	E2	E3	E4
	12/45 Bend	*215.00*	*1.25*	*2.00*	*2/12*	*65.40*	*CE-Electric*	*1.07*	*1.07*	*0.00*
6.50							*CE-Electric*	*4.60*	*4.60*	*0.00*
	12/45 Bend	*215.00*	*1.25*	*2.00*	*2/12*	*65.40*	*CE-Electric*	*1.07*	*1.07*	*0.00*
5.00							*CE-Electric*	*5.00*	*5.00*	*0.00*
	12/45 Bend	*215.00*	*1.25*	*2.00*	*2/12*	*65.40*	*CE-Electric*	*1.07*	*1.07*	*0.00*
6.50							*CE-Electric*	*4.60*	*4.60*	*0.00*
	12/45 Bend	*215.00*	*1.25*	*2.00*	*2/12*	*65.40*	*CE-Electric*	*1.07*	*1.07*	*0.00*

EXAMPLES OF THEORETICAL PAYMENTS FOR UTILITY INTERFERENCES

Example No. 2 (Vertical Offset):



WORKSHEET ENTRIES:

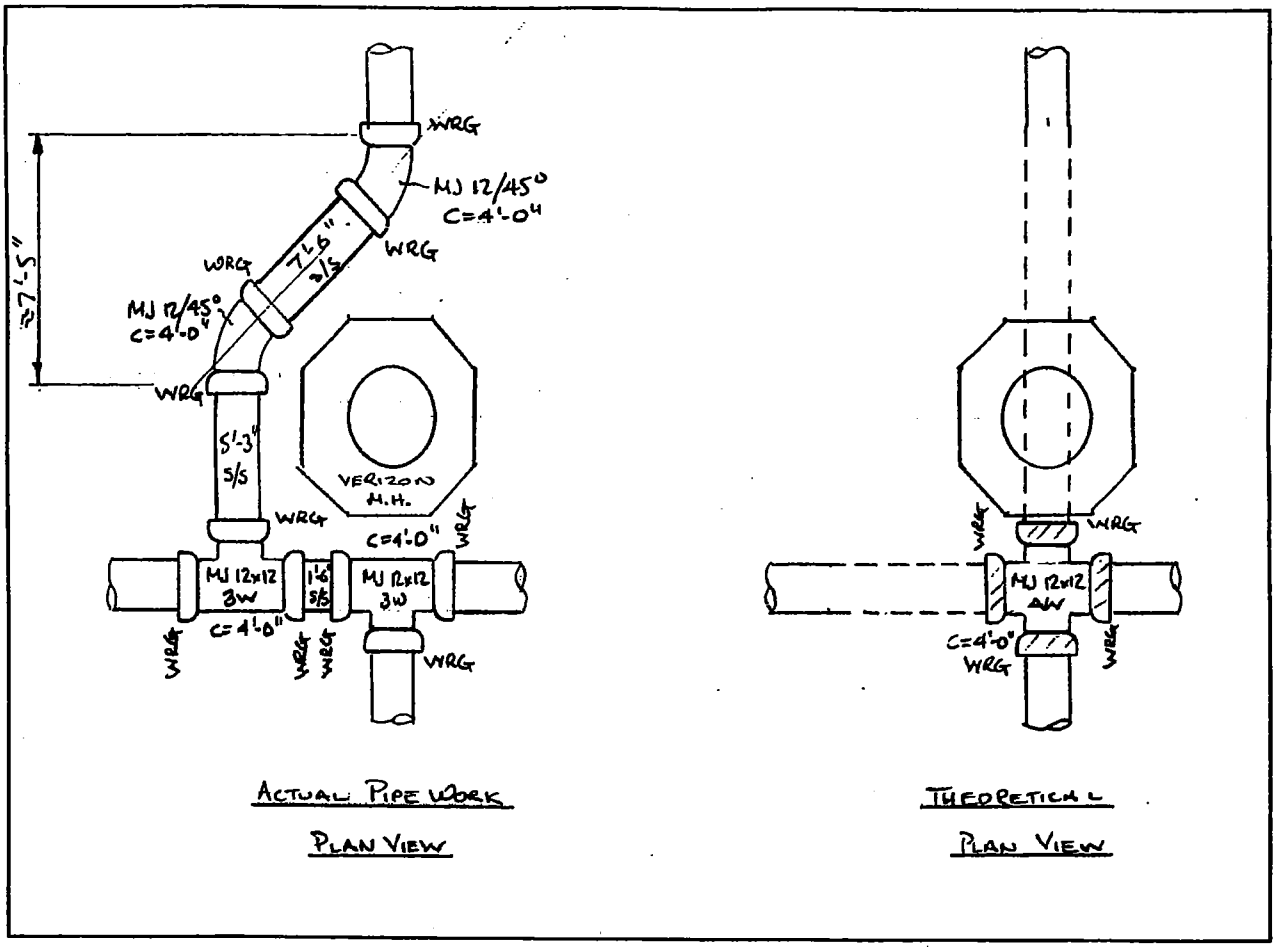
DIP Straight (LF)	Pipe Fittings & Wedge Type Retainer Glands						Utility Offset - Theoretical Work			
	Mechanical Joint Fitting Description	Bare Fitting Wt. (lbs)	Fitting Lay Length (LF)	Allowance (LF)	Wedge Type Ret.Glands (No./Size)	Total WRG Wt. (lbs)	Utility Co.	F/D DIP (LF)	Lay (LF)	F/ MJ Fittings & WRG (lbs)
B	C1	C2	C3	C4	D1	D2	E1	E2	E3	E4
	12x18 OS	*520.00*	*4.00*	*2.00*	*2/12*	*65.40*	*Verizon*	*4.00*	*4.00*	*0.00*
4.00							*Verizon*	*4.00*	*4.00*	*0.00*
	12x18 OS	*520.00*	*4.00*	*2.00*	*2/12*	*65.40*	*Verizon*	*4.00*	*4.00*	*0.00*

Notes:

1. Although the offset will require additional excavation and possibly some clean fill, it is a matter of adjustment between the contractor and the private utility.

EXAMPLES OF THEORETICAL PAYMENTS FOR UTILITY INTERFERENCES

Example No. 3 (Equivalent Fitting Offset):

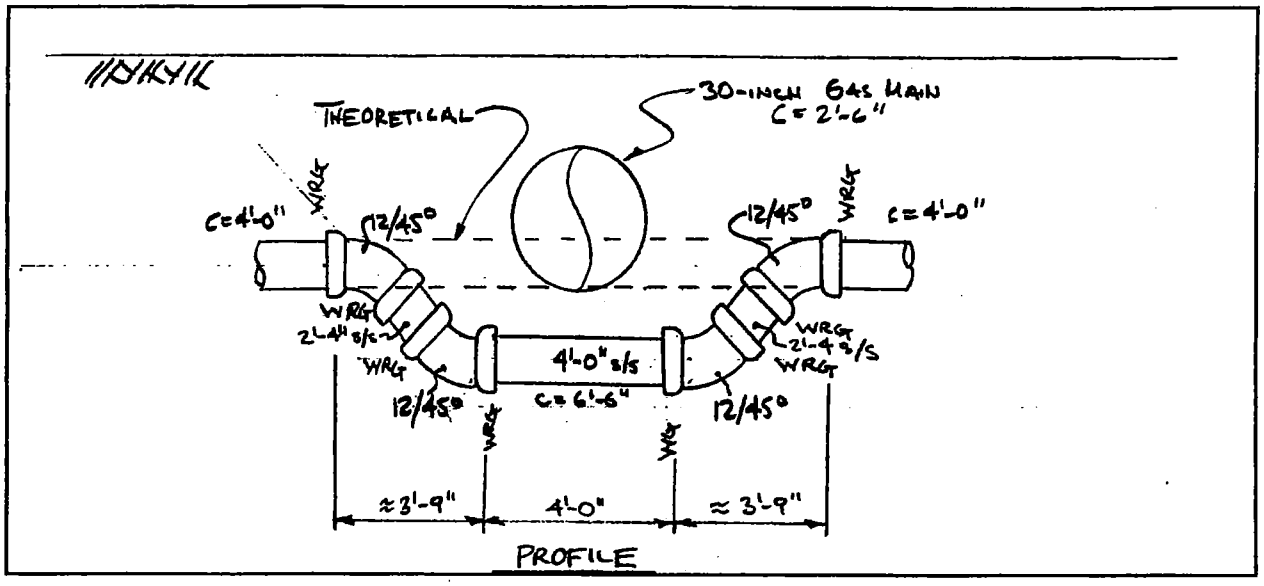


WORKSHEET ENTRIES:

DIP Straight (LF)	Pipe Fittings & Wedge Type Retainer Glands						Utility Offset - Theoretical Work			
	Mechanical Joint Fitting Description	Bare Fitting Wt. (lbs)	Fitting Lay Length (LF)	Allowance (LF)	Wedge Type Ret.Glands (No./Size)	Total WRG Wt. (lbs)	Utility Co.	F/D DIP (LF)	Lay (LF)	F/ MJ Fittings & WRG (lbs)
B	C1	C2	C3	C4	D1	D2	E1	E2	E3	E4
	12/45 Bend	*215.00*	*1.25*	*2.00*	*2/12*	*65.40*	*Verizon*	*1.07*	*1.07*	*0.00*
7.50							*Verizon*	*5.30*	*5.30*	*0.00*
	12/45 Bend	*215.00*	*1.25*	*2.00*	*2/12*	*65.40*	*Verizon*	*1.07*	*1.07*	*0.00*
5.25							*Verizon*	*5.25*	*5.25*	*0.00*
	12x12 3W	*410.00*	*3.00*	*3.00*	*3/12*	*98.10*	*Verizon*	*2.00*	*2.00*	*0.00*
1.50							*Verizon*	*1.50*	*1.50*	*0.00*
	12x12 3W	*410.00*	*3.00*	*3.00*	*3/12*	*98.10*	*Verizon*	*0.00*	*8.00*	*625.80*

EXAMPLES OF THEORETICAL PAYMENTS FOR UTILITY INTERFERENCES

Cost Sharing - EP7
Example No. 4 (Vertical Offset):



WORKSHEET ENTRIES:

DIP Straight (LF)	Pipe Fittings & Wedge Type Retainer Glands						Utility Offset - Theoretical Work			
	Mechanical Joint Fitting Description	Bare Fitting Wt. (lbs)	Fitting Lay Length (LF)	Allowance (LF)	Wedge Type Ret.Glands (No./Size)	Total WRG Wt. (lbs)	Utility Co.	F/D DIP (LF)	Lay (LF)	F/ MJ Fittings & WRG (lbs)
B	C1	C2	C3	C4	D1	D2	E1	E2	E3	E4
	12/45 Bend	*215.00*	*1.25*	*2.00*	*2/12*	*65.40*	*CE-EP7*	*0.00*	*0.00*	*0.00*
2.33							*CE-EP7*	*0.00*	*0.00*	*0.00*
	12/45 Bend	*215.00*	*1.25*	*2.00*	*2/12*	*65.40*	*CE-EP7*	*0.00*	*0.00*	*0.00*
4.00							*CE-EP7*	*0.00*	*0.00*	*0.00*
	12/45 Bend	*215.00*	*1.25*	*2.00*	*2/12*	*65.40*	*CE-EP7*	*0.00*	*0.00*	*0.00*
2.33							*CE-EP7*	*0.00*	*0.00*	*0.00*
	12/45 Bend	*215.00*	*1.25*	*2.00*	*2/12*	*65.40*	*CE-EP7*	*0.00*	*0.00*	*0.00*

PAYMENT UNDER "WATER MAIN ACCOMMODATIONS":

F/D 12-inch DIP -
$22/LF x (2.33 + 4.00 + 2.33) = $ 183.26

Lay 12-inch DIP & Fittings -
$40/LF x (2.33 + 4.00 + 2.33 + 4 x (1.25 +2)) = $ 853.20

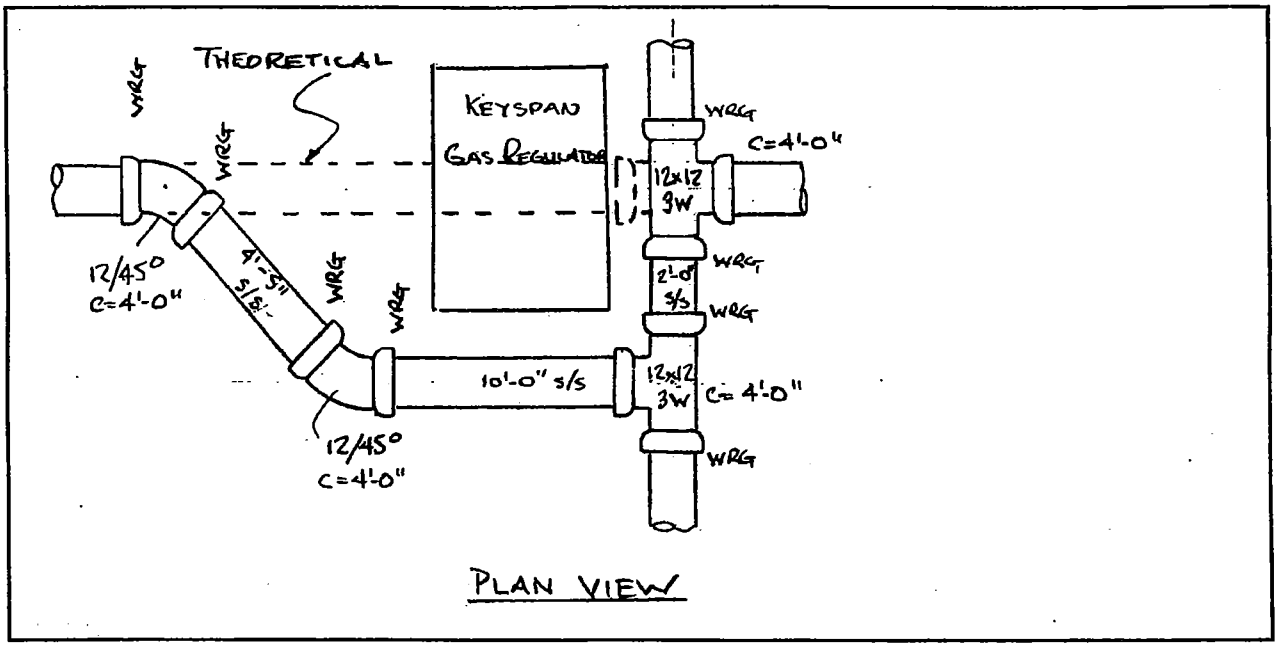
F/ Fittings & WRG -
$3,750/TN x TN/2000LB x (4 x (215 + 65.4)) = $ 2,103.00

Excavation Outside Trench Limits -
$25/CY x CY/27CF x 3' x (2.5' x (4' + 2 x (1.25)' + 2 x 0.5 x 1.5' x 1.5') = $ 51.50

"Total for "Water Main Accommodations" $ 3,190.96

EXAMPLES OF THEORETICAL PAYMENTS FOR UTILITY INTERFERENCES

Cost Sharing - EP7
Example No. 5 (Equivalent Fitting Offset):



WORKSHEET ENTRIES:

DIP Straight (LF)	Pipe Fittings & Wedge Type Retainer Glands						Utility Offset - Theoretical Work			
	Mechanical Joint Fitting Description	Bare Fitting Wt. (lbs)	Fitting Lay Length (LF)	Allowance (LF)	Wedge Type Ret.Glands (No./Size)	Total WRG Wt. (lbs)	Utility Co.	F/D DIP (LF)	Lay (LF)	F/ MJ Fittings & WRG (lbs)
B	C1	C2	C3	C4	D1	D2	E1	E2	E3	E4
	12/45 Bend	*215.00*	*1.25*	*2.00*	*2/12*	*65.40*	*Keyspan-EP7*	*0.00*	*0.00*	*0.00*
4.42							*Keyspan-EP7*	*0.00*	*0.00*	*0.00*
	12/45 Bend	*215.00*	*1.25*	*2.00*	*2/12*	*65.40*	*Keyspan-EP7*	*0.00*	*0.00*	*0.00*
10.00							*Keyspan-EP7*	*0.00*	*0.00*	*0.00*
	12x12 3W	*410.00*	*3.00*	*3.00*	*3/12*	*98.10*	*Keyspan-EP7*	*0.00*	*0.00*	*0.00*
2.33							*Keyspan-EP7*	*0.00*	*0.00*	*0.00*
	12x12 3W	*410.00*	*3.00*	*3.00*	*3/12*	*98.10*	*Keyspan-EP7*	*0.00*	*0.00*	*0.00*

PAYMENT UNDER "WATER MAIN ACCOMMODATIONS":

F/D 12-inch DIP -
$22/LF x (4.42 + 10 + 2) = $ 361.24

Lay 12-inch DIP & Fittings -
$40/LF x (4.42 + 10 + 2 + 2 x (1.25 +2 + 3 + 3)) = $ 1,396.80

F/ Fittings & WRG -
$3,750/TN x TN/2000LB x [(2 x (215 + 65.4) + 2 x (410 + 98.1)] = $ 2,956.88

Total for "Water Main Accommodations" $ 4,714.92

Sample Payment Calculation

General:
The sample calculation consists of two daily inspector reports for the installation of 20-inch water main that includes two system tie-ins and appurtenant work. Each inspector report includes a line sketch of the water main work performed and is followed by the completed worksheets of various pipe sizes. The second daily inspector report also includes sketches outlining theoretical pipe payments and calculations for offset work performed for a 12-inch Keyspan gas main and a Con Edison manhole.

Payment quantities for the inspector reports are normally determined on a daily basis for logging into the "payment book". The sample payment quantities are presented in a condensed format located at the end of the section.

For the Sample Calculation, the following Unit Prices are being used:

Item No.	Item Description	Unit	Unit Price
WM-025	F/D 20-inch DI Restrained Joint Pipe	LF	$47.00
WM-027	F/D 12-inch DI Restrained Joint Pipe	LF	$23.00
WM-028	F/D 8-inch DI Restrained Joint Pipe	LF	$14.00
WM-029	F/D 6-inch DI Restrained Joint Pipe	LF	$9.00
WM-036	F/D/I DI, MJ Fittings w/ Wedge Type Retainer Glands	TONS	$2,300.00
WM-041	Laying 20-inch DI Pipe & Fittings	LF	$55.00
WM-043	Laying 12-inch DI Pipe & Fittings	LF	$43.00
WM-044	Laying 8-inch DI Pipe & Fittings	LF	$41.00
WM-045	Laying 6-inch DI Pipe & Fittings	LF	$25.00
WM-091	F/D/I 20-inch MJ, DI Gate Valve w/ Wedge Type Retainer Glands	EA	$7,500.00
WM-094	F/D/I 6-inch MJ, DI Gate Valve w/ Wedge Type Retainer Glands	EA	$700.00
WM-144	F/D Various Castings Incl. But Not Limited To 24-inch MH Skirts, Heads & Covers, & Hydrant Valve Box, etc.	TONS	$750.00
WM-149	F/D Hydrants	EA	$1,350.00
WM-150	Setting Hydrants Complete w/ Wedge Type Retainer Glands	EA	$600.00
WM-164	Withdraw & Replacing House Services Using 1½-inch Or Larger Screw Taps	EA	$150.00
WM-179	Extending House Services (Pipe Less Than 3-inch Diameter)	LF	$30.00
WM-198	Furnishing & Placing Temporary Tight Sheeting	SF	$0.25
WM-206	Excavation Required Outside The Pipe Trench (Including the Excavation and Disposal of Pavement)	CY	$30.00
UTL-6.01.9	Gas Main Crossing Water Main Up To 20-inch In Diameter (S6.01)	EA	$350.00
UTL-GCS-2	Water Main Accommodations - Gas Cost Sharing, General Provision Paragraph No.2	F.S.	$10,000.00

Sample Payment Calculation

DDC

INSPECTOR'S REPORT - WATERMAIN

Date: Apr 16 [illegible]

Day of week: S M T W T F S

City of New York Department of Design and Construction

I.R. No.: 58

Sheet No. 1 of 4

Contract No: SEQ002563 Reg. No: 20030004442

Project Description: Combined Sewer in Penelope Avenue

Work Activity Time: (Start 7[illegible] End 3[illegible])

Borough: QUEENS

Inspector Time: (Start 7[illegible] End 3[illegible])

Contractor: Tucci Equipment Rental Corp.

Inspector Name: Al Smith

Temp.	Low 48°F	High 60°F	
General Weather Conditions	AM P/Cloudy	PM P/Cloudy	

General Activity: Install 20-inch Water Main

Location: Penelope Ave. bet. 80th St. & 79th St.

Subcontractor (if any):

Saw cut	-0+10	3+45	
Pavement removed	-0+10	1+75	Width 3.67 Type/Thickness Asphalt 6"
Trench excavated	-0+10	1+75	Width 3.67 Depth 6'-2"
Trench sheeted	-0+10	1+75	☑ Sheeting required ☐ Not required
Trench backfilling and compaction	-0+10	1+70	
Temp. pavement	-0+10	0+25	Ave. Width 3.67 Min. thickness 4"
Other			

Out of existing 20" W Bell of a 20x20 MJ located 9' S/of NCL of Penelope Ave. & 9' W/of E CL of 80th St., w/ 4'0" Cover going east @ STA-0+08.25

20" WRG

20" S/B 18.92 w/ FLG

20" S/S 5.00

20" WRG

20" MJ Gate Valve w/ MLVB set w/ concrete block, C=4'0" STA 0+00

20" WRG

20" S/B 18.83 w/ FLG

20" S/B 18.92 w/ FLG

20" S/B 18.83 w/ FLG

20" S/B 18.83 w/ FLG C=4'-0"

20" S/B 18.83 w/ FLG (Cont'd on Sheet 2)

MATERIAL REQUISITIONED: N/A

20" P/O Pipe - USPipe, 20" WRG - Ford Uni-Flange,

20" Gate Valve - Sigma

ALL PIPES VISUALLY INSPECTED PRIOR TO INSTALLATION ? ☑ Y ☐ N

Water Off Time 805 Am Water On Time 245 PM Informed DEP Rich Wallace Name 300 PM Time

Rvsd. 07/12/20 (IRW.DDC) LA

4A

Sample Payment Calculation

				Page 2/4	Rvsd.	07/12/20	(JRW,DDC) LA	SEQ002563
		✓						
	✓			Open Joint	✓			
	1%			Pressure				
On Site	✓							
Used	✓			1.5" Tap	✓			
				Hydrant		✓		
On Site	✓			Time(min) /Res. Chlorine(ppm)	35 min 300 PPM			
Qty. Used								
				Trench cleaned of Debris	✓			
Setting	8 5/8-16" - T-bolts			Material used to 1' above pipe	Sand - Oyster Band			
Used	✓			Material used for remainder	Native - Sand			
				Lab Tech. Present	✓			
On Site	✓			Name of Lab. Tech.	MTL - Richardson			
Size	20" & 6"			Backfill Compacted	✓			
				No. of Lifts	3			
Sand Bags	✓			Equipment Used				
Other (explain)								

Type			TYPE					
Superintendent	1	8	Front End Loader	Cat 950E	1	8		
Foremen	1	8	Backhoe	Cat 320D	1	8		
Operators	2	8	Crane					
Laborers	4	8	Truck(Dump)	20 CY / 10 Wheel	2	8		
Flaggers	1	8	Roller	Wacker 30"	1	8		
Carpenters			Compressor					
Timbermen			Excavator					
Masons			Trailers					
Chauffers	2	8	Pavement Cutter	Target 400				
			Tampers	Wacker	1	8		
			Pickup Truck	Ford 350	1	8		

Plastic Barrels	✓		
Pedestrian Barricades	✓		
Timber Curbs		✓	
Timber/Breakaway Barricades		✓	
General Safety Conditions	✓		
Local Emergency Access	✓		
Fencing		✓	
Plates	✓		
Arrow Board		✓	
Site cleaned and secured at end of day	✓		

Comments:

USE PAGE 3 FOR SKETCHES, WORK CHECK LIST AND TAP RECORDS

Sample Payment Calculation

DDC

City of New York Department of Design and Construction

INSPECTOR'S REPORT - WATERMAIN

Date: April 6, 2003

Day of week: S M T W T F S

I.R. No.: 58

Sheet No. 2 of 4

Contract No: SEQ002563 Reg. No: 20030004442

Project Description: Combined Sewer in Penelope Avenue

Borough: QUEENS

Contractor: Tucci Equipment Rental Corp.

Inspector Name: Al Smith

Work Activity Time: (Start____ End____)

Inspector Time: (Start____ End____)

Temp.	Low	High
General Weather Conditions	AM	PM

General Activity: Install 20-inch Water Main

Location: Penelope Avenue bet. 80th St. & 79th St.

Subcontractor (if any):

ACTIVITIES			
Saw cut			
Pavement removed			Width____ Type / Thickness____
Trench excavated			Width____ Depth____
Trench sheeted			☐ Sheeting required ☐ Not required
Trench backfilling and compaction			
Temp. pavement			Ave. Width____ Min. thickness____
Other			

20" S/S 4.08'
20" WRG
20x6 SW 6" Branch F/North C=4'-0" STA 1+00
20" WRG
20" S/B 14.75' w/ FLG
20" S/B 18.83' w/ FLG
20" S/B 18.92' w/ FLG
20" S/B 19.00' w/ P.O. Gasket C=4'-0" STA 1+73
20" S/S 2.00 (Temp) w/ 1½" tap for flushing
20" WRG (Temp)
20" CAP (Temp) Braced against existing 12" W.M. being removed

12" WRG (Temp)
12" CAP (Temp)

MATERIAL REQUISITIONED: N/A

20x6 SW - Tyler

ALL PIPES VISUALLY INSPECTED PRIOR TO INSTALLATION ? ☐ Y ☐ N

Water Off Time____ Water On Time____ Informed DEP____ Name____ Time____

Rvsd. 07/12/20 (IRW.DDC) LA.

4A

Sample Payment Calculation

DDC

City of New York Department of Design and Construction

INSPECTOR'S REPORT - WATERMAIN

Date: April 16, 2003

Day of week: S [X] T W T F S

I.R. No.: 58

Sheet No. 3 of 4

Contract No: SEQ002563 Reg. No: 20030004442

Project Description: Combined Sewer in Penelope Avenue

Work Activity Time: (Start____ End____)

Borough: QUEENS

Inspector Time: (Start____ End____)

Contractor: Tucci Equipment Rental Corp.

Inspector Name: Al Smith

Temp.	Low	High
General Weather Conditions	AM	PM

General Activity: Install 20-inch Water Main

Location: Penelope Ave. bet. 80th St. & 79th St.

Subcontractor (if any):

Saw cut			
Pavement removed			Width____ Type / Thickness____
Trench excavated			Width____ Depth____
Trench sheeted			☐ Sheeting required ☐ Not required
Trench backfilling and compaction			
Temp. pavement			Ave. Width____ Min. thickness____
Other			

Cut & 6" Branch of 20x6 3W located at STA 1+00 going northw...

6" WRG

6" S/S 2.00'

6" WRG

6" MJ Gate w/ HVB set w/ concrete block C = 4'-6"

6" WRG

6" S/S 6.83

6" WRG

D2LP w/ MJ Bell, 4'-6" Barrel, CIDB & Cu drain @ STA 1+00

MATERIAL REQUISITIONED: N/A

6" Pipe - US Pipe, 6" Gate Valve - Sigma, Hydrant - Penn Troy (Power)

6" WRG - Sigma One Lok

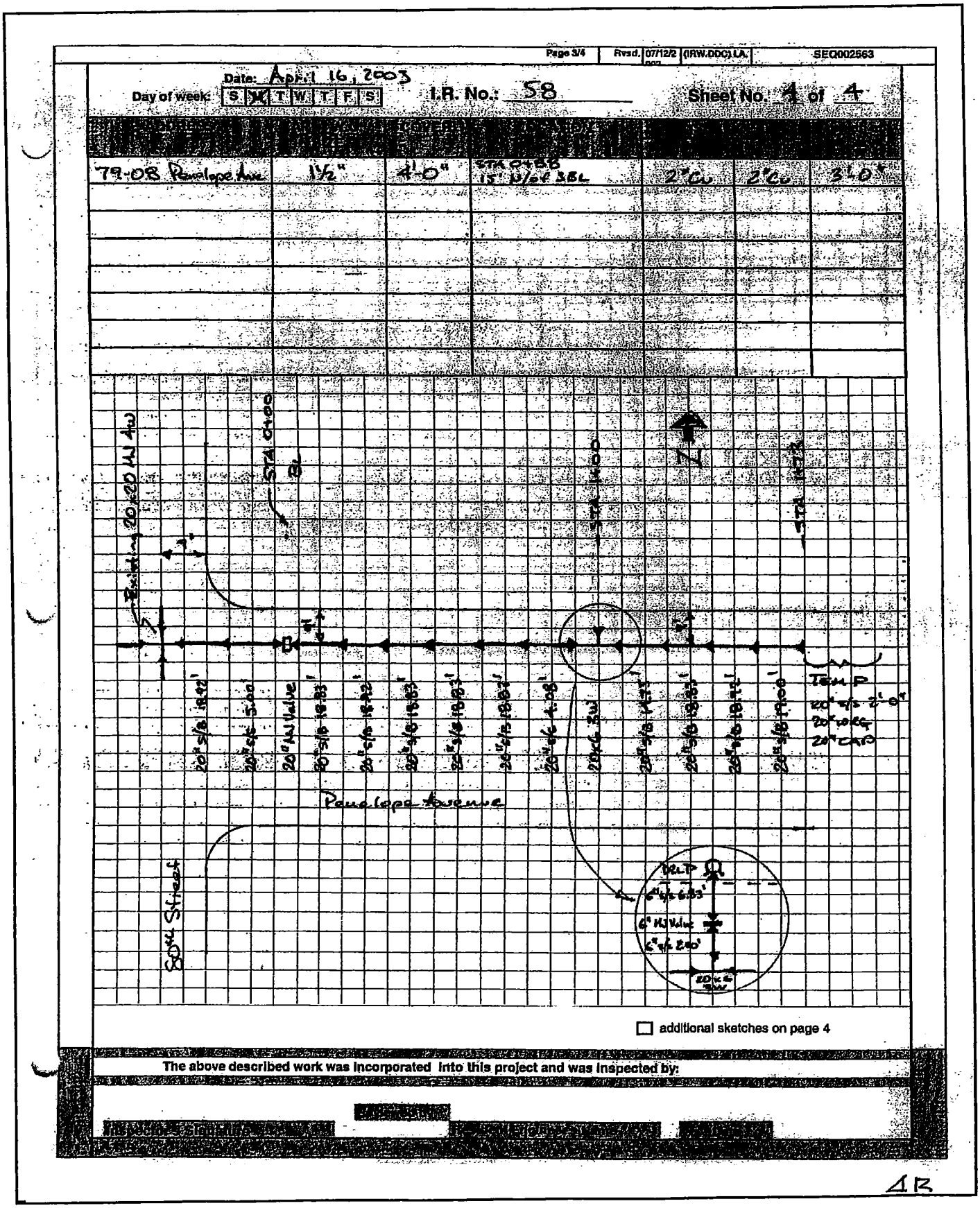
ALL PIPES VISUALLY INSPECTED PRIOR TO INSTALLATION ? ☐ Y ☐ N

Water Off Time____ Water On Time____ Informed DEP____ ____

Name Time

Rvsd. 07/12/20 (IRW.DDC) I.A.

Sample Payment Calculation



Page 3/4 | Rvsd. 07/12/2 (IRW.DOC) LA. | SEC002563

Date: April 16, 2003

Day of week: S M T W T F S

I.R. No.: 58

Sheet No. 4 of 4

79-08 Penelope Ave	1½"	4'-0"	STA 0+50 15" D/C/I SBL	2" Cu	2" Cu	3'-0"

Penelope Avenue

20th Street

☐ additional sketches on page 4

The above described work was incorporated into this project and was inspected by:

AB

Page 1 of 1

Distribution Water Main Payment Calculation Worksheet

Contract No.: SEQ-002563 Prepared By: Al Smith Date: 4/17/03

Nominal Pipe Size: 20" Checked By: Date:

Date		DIP Straight (LF)	Pipe Fittings & Wedge Type Retainer Glands						Utility Offset - Theoretical Work				Payment Item Totals by Line		
			Mechanical Joint Fitting Description	Bare Fitting Wt. (lbs)	Fitting Lay Length (LF)	Allowance (LF)	Wedge Type Retainer Glands (No./Size)	Total WRG Wt. (lbs)	Utility Co.	F/D DIP (LF)	Lay (LF)	F/ MJ Fittings & WRG (lbs)	F/D DIP (LF)	Lay (LF)	F/ MJ Fittings & WRG (lbs)
A		B	C1	C2	C3	C4	D1	D2	E1	E2	E3	E4	F	G	H
4/16		18.92											18.92	18.92	0
		5.00											5.00	5.00	0
			20" WJ Valve		0.83	—							0	.83	0
		18.83											18.83	18.83	0
		18.92											18.92	18.92	0
		18.83											18.83	18.83	0
		18.83											18.83	18.83	0
		18.83											18.83	18.83	0
		4.08											4.08	4.08	0
			20x6 SW	725	3.75	3	2/20 & 1/6	161.6					0	6.75	886.6
		14.75											14.75	14.75	0
		18.83											18.83	18.83	0
		18.92											18.92	18.92	0
		19.00											19.00	19.00	0
	T	2.00											2.00	2.00	0
	T		20/CAP	240	0	1	2/20	74.8					0	1.00	314.8
										DAY	TOTAL	4/16	195.74	206.32	1,201.4

Distribution Water Main Payment Calculation Worksheet

Page 1 of 1

Contract No.: SEQ-002563

Prepared By: Al Smith Date: 4/17/03

Nominal Pipe Size: 12"

Checked By: Date:

Date	DIP Straight (LF)	Pipe Fittings & Wedge Type Retainer Glands						Utility Offset - Theoretical Work				Payment Item Totals by Line		
		Mechanical Joint Fitting Description	Bare Fitting Wt. (lbs)	Fitting Lay Length (LF)	Allowance (LF)	Wedge Type Retainer Glands (No./Size)	Total WRG Wt. (lbs)	Utility Co.	F/D DIP (LF)	Lay (LF)	F/ MJ Fittings & WRG (lbs)	F/D DIP (LF)	Lay (LF)	F/ MJ Fittings & WRG (lbs)
A	B	C1	C2	C3	C4	D1	D2	E1	E2	E3	E4	F	G	H
4/16 T		12/CAP	80	0	1	1/12	32.7					0	1.00	112.70
									DAY	TOTAL	4/16	0	1.00	112.70

Distribution Water Main Payment Calculation Worksheet

Page 1 of 1

Contract No.: SEQ-002563

Prepared By: Al Smith Date: 4/17/03

Nominal Pipe Size: 6"

Checked By: Date:

Date	DIP Straight (LF)	Pipe Fittings & Wedge Type Retainer Glands						Utility Offset - Theoretical Work				Payment Item Totals by Line		
		Mechanical Joint Fitting Description	Bare Fitting Wt. (lbs)	Fitting Lay Length (LF)	Allowance (LF)	Wedge Type Retainer Glands (No./Size)	Total WRG Wt. (lbs)	Utility Co.	F/D DIP (LF)	Lay (LF)	F/ MJ Fittings & WRG (lbs)	F/D DIP (LF)	Lay (LF)	F/ MJ Fittings & WRG (lbs)
A	B	C1	C2	C3	C4	D1	D2	E1	E2	E3	E4	F	G	H
4/16	2.00											2.00	2.00	0
↓		6" MJ Valve			—							0	0	0
↓	6.83											6.83	6.83	0
									DAY	TOTAL	4/17	8.83	8.83	0

Sample Payment Calculation

DDC

City of New York Department of Design and Construction

INSPECTOR'S REPORT - WATERMAIN

Date: April 17, 2003

Day of week: S | M | T | W | T | F | S

I.R. No.: 59

Sheet No. 1 of 5

Contract No: SEQ002563 Reg. No: 20030004442

Project Description: Combined Sewer in Penelope Avenue

Borough: QUEENS

Contractor: Tucci Equipment Rental Corp.

Inspector Name: Al Smith

Work Activity Time: (Start 7⁰⁰ End 4⁰⁰)

Inspector Time: (Start 7³⁰ End 4⁰⁰)

Temp.	Low 52	High 62
General Weather Conditions	AM Sunny	PM Sunny

General Activity: Install 20, 12, & 8 inch Water Main

Location: Penelope Ave. bet. 80th & 79th St. & int. w/ 79th St.

Subcontractor (if any):

Saw cut	—	—	
Pavement removed	1+75	3+45	Width 3.67 Type / Thickness Asphalt 8"
Trench excavated	1+75	3+45	Width 3.67 Depth 6'-2"
Trench sheeted			☑ Sheeting required ☐ Not required
Trench backfilling and compaction			
Temp. pavement	0+25	1+70	Ave. Width 3.67 Min. thickness 4"
Other			

Out of 20" P/O Bell laid 4/6/03 w/ 4'-0" Cover, STA 1+73 going east

20" FLG

20" S/B 19.00 w/FLG

20" S/B 18.83 w/FLG

20" S/B 18.92 w/FLG C=4'-0"

20" S/B 18.75 w/FLG

20" S/S 17.00

20" WRG

20x18 OS DN

20" WRG

20" S/S 5.33 C=5'-6"

20" WRG

20x18 OS UP (cont'd on Sheet 2)

Vertical Offset for Keyspan 12" HP Plastic Gas Main STA 2+72.5 C=3'-6"

MATERIAL REQUISITIONED: N/A

20" P/O Pipe - US Pipe, 20" WRG - Ford Uni-Flange, 20x18 OS - Tyler

ALL PIPES VISUALLY INSPECTED PRIOR TO INSTALLATION ? ☑ Y ☐ N

Water Off Time 8¹⁰ AM Water On Time 2⁴⁵ PM Informed DEP R. Wallace (Name) 3¹⁵ PM (Time)

Rvsd. 07/12/20 (IRW.DDC) I.A.

Sample Payment Calculation

Page 2/4 | Rvsd. 07/12/20 | (RW.DOC) LA | SEQ002563

	✓						
	✓			Open Joint	✓		
		17%		Pressure			
On Site	✓						
Used	✓			1.5" Tap			
				Hydrant		✓	Backfilled
On Site	✓			Time(min) /Res. Chlorine(ppm)			35 min 300 PPM
Qty. Used							
				Trench cleaned of Debris	✓		
Setting		85 ft-lbs Tightly		Material used to 1' above pipe			Sand - Oyster Bay
Used	✓			Material used for remainder			Native - Sand
				Lab Tech. Present	✓		
On Site	✓			Name of Lab. Tech.			MTL - Richardson
Size			20", 12" & 8"	Backfill Compacted	✓		
				No. of Lifts			3
Sand Bags	✓			Equipment Used			
Other (explain)				Wacker Vibratory Plate	✓		
				Wacker 30 inch Vib Roller	✓		

Type			TYPE					
Superintendent	1	8½	Front End Loader	Cat 950 H	1	8½		
Foremen	1	8½	Backhoe	Cat 320	1			
Operators	2	8½	Crane					
Laborers	4	8½	Truck(Dump)	20CY 10 Wheel	2	8		
Flaggers	1	8½	Roller	Wacker 30"	1	8½		
Carpenters			Compressor					
Timbermen			Excavator					
Masons			Trailers					
Chauffers	2	8½	Pavement Cutter					
			Tampers	Wacker JdJ	1	8½		
			Pickup Truck	Ford 350				

Plastic Barrels	✓	
Pedestrian Barricades	✓	
Timber Curbs		✓
Timber/Breakaway Barricades		✓
General Safety Conditions	✓	
Local Emergency Access	✓	
Fencing		✓
Plates	✓	
Arrow Board		✓
Site cleaned and secured at end of day	✓	

Comments:

USE PAGE 3 FOR SKETCHES, WORK CHECK LIST AND TAP RECORDS

Sample Payment Calculation

DDC

INSPECTOR'S REPORT - WATERMAIN

City of New York Department of Design and Construction

Date: April 17, 2003

Day of week: S M **X** W T F S

I.R. No.: 59

Sheet No. 2 of 5

Contract No: SEQ002563 Reg. No: 20030004442

Project Description: Combined Sewer in Penelope Avenue

Borough: QUEENS

Contractor: Tucci Equipment Rental Corp.

Inspector Name: Al Smith

Work Activity Time: (Start____ End____)

Inspector Time: (Start____ End____)

Temp.	Low	High
General Weather Conditions	AM	PM

General Activity: Install 20, 12 & 8 inch Water Main

Location: Penelope Ave. bet. 80th & 79th St. & int. w/ 79th St.

Subcontractor (if any):

ACTIVITIES			
Saw cut	—	—	
Pavement removed			Width____ Type / Thickness____
Trench excavated			Width____ Depth____
Trench sheeted			☑ Sheeting required ☐ Not required
Trench backfilling and compaction			
Temp. pavement			Ave. Width____ Min. thickness____
Other			

20" WRG) Keyspan Offset

20" S/B 14.83' W/ FLG

20" S/B 18.92 W/ FLG C=4'-0"

20" S/S 2.58

20" WRG

20x8 3W 8" Branch F/ South C= 4'-0" STA 3+17

20" WRG

20" S/S 6.67

20" WRG

20x12 3W 12" Branch F/ North C= 4'-0" STA 3+26) Verizon MH Offset

20" WRG

20" S/B 15.83

20" WRG

20" SLV (Cont'd on Sheet 3)

MATERIAL REQUISITIONED:

20x8 3W, 20x12 3W – Tyler 20" SLV – Sigma

ALL PIPES VISUALLY INSPECTED PRIOR TO INSTALLATION ? ☐ Y ☐ N

Water Off Time____ Water On Time____ Informed DEP____ Name____ Time____

Rvsd. 07/12/20 (IRW.DDC) I.A.

Sample Payment Calculation

DDC

City of New York Department of Design and Construction

INSPECTOR'S REPORT - WATERMAIN

Date: April 17, 2003

Day of week: S | M | T | W | T | F | S

I.R. No.: 59

Sheet No. 3 of 5

Contract No: SEQ002563 Reg. No: 20030004442

Project Description: Combined Sewer in Penelope Avenue

Borough: QUEENS

Contractor: Tucci Equipment Rental Corp.

Inspector Name: Al Smith

Work Activity Time: (Start____ End____)

Inspector Time: (Start____ End____)

Temp.	Low	High
General Weather Conditions	AM	PM

General Activity: Install 20, 12 & 8 inch Water Main

Location: Penelope Ave. bet. 80th & 79th & int. w/ 79th St.

Subcontractor (if any):

Saw cut			
Pavement removed			Width____ Type / Thickness____
Trench excavated			Width____ Depth____
Trench sheeted			☐ Sheeting required ☐ Not required
Trench backfilling and compaction			
Temp. pavement			Ave. Width____ Min. thickness____
Other			

20" WRG } Verizon
Onto existing 20" Watermain w/ 4'-0" Cover at STA 3+43 } Offset

Out of 12" Branch of 20x12 3W at STA 3+26 going north

12" WRG

12" S/S G.O

12" WRG

12" SLV

12" WRG

Onto existing 12" Watermain w/ 4'-0" Cover located in lane 9' West of ECL of 79th Street & 21'-6" South of NCL of Penelope Ave.

MATERIAL REQUISITIONED:

12" WRGs - Sigmen OneLok

ALL PIPES VISUALLY INSPECTED PRIOR TO INSTALLATION ? ☐ Y ☐ N

Water Off Time____ Water On Time____ Informed DEP____ ____

Name Time

Rvsd. 07/12/20 (IRW.DDC) I.A.

Sample Payment Calculation

DDC
City of New York Department of Design and Construction

INSPECTOR'S REPORT - WATERMAIN

Date: April 17, 2003
Day of week: S M T W T F S

I.R. No.: 59
Sheet No. 4 of 5

Contract No: SEQ002583 Reg. No: 20030004442
Project Description: Combined Sewer in Penelope Avenue
Borough: QUEENS
Contractor: Tucci Equipment Rental Corp.
Inspector Name: Al Smith

Work Activity Time: (Start ____ End ____)
Inspector Time: (Start ____ End ____)

Temp.	Low	High
General Weather Conditions	AM	PM

General Activity: Install 20, 12 & 8 inch Water Main
Location: Penelope Ave. bet. 80th & 79th & int. w/ 79th St.
Subcontractor (if any):

Saw cut			
Pavement removed			Width ____ Type / Thickness ____
Trench excavated			Width ____ Depth ____
Trench sheeted			☐ Sheeting required ☐ Not required
Trench backfilling and compaction			
Temp. pavement			
Other			Ave. Width ____ Min. thickness ____

Out of 8" Branch of 20x8 SW at STA 3+17 going south
8" WRGV
8" S/S 8.00
8" WRGV
8/45° Bend Horiz towards East — Verizon M.H. Offset
8" WRGV
8" S/S 11.83
8" WRGV
8/45° Bend Horiz towards South
8" WRGV
8" S/S 4.00
8" SLV
8" WRGV
Onto existing 8" Watermain w/ 4'-0" Cover located in lane 9' West of ECL

MATERIAL REQUISITIONED:
8" WRGV - Sigma QuikLok, 8/45 Bend & 8" SLV - Tyler

ALL PIPES VISUALLY INSPECTED PRIOR TO INSTALLATION ? ☐ Y ☐ N

Water Off Time ____ Water On Time ____ Informed DEP ____ Name ____ Time ____

Rvsd. 07/12/20 (IRW.DDC) LA

Sample Payment Calculation

Page 3/4 | Rvsd. 07/12/2 | (IRW.DDC) LA | SEQ002563

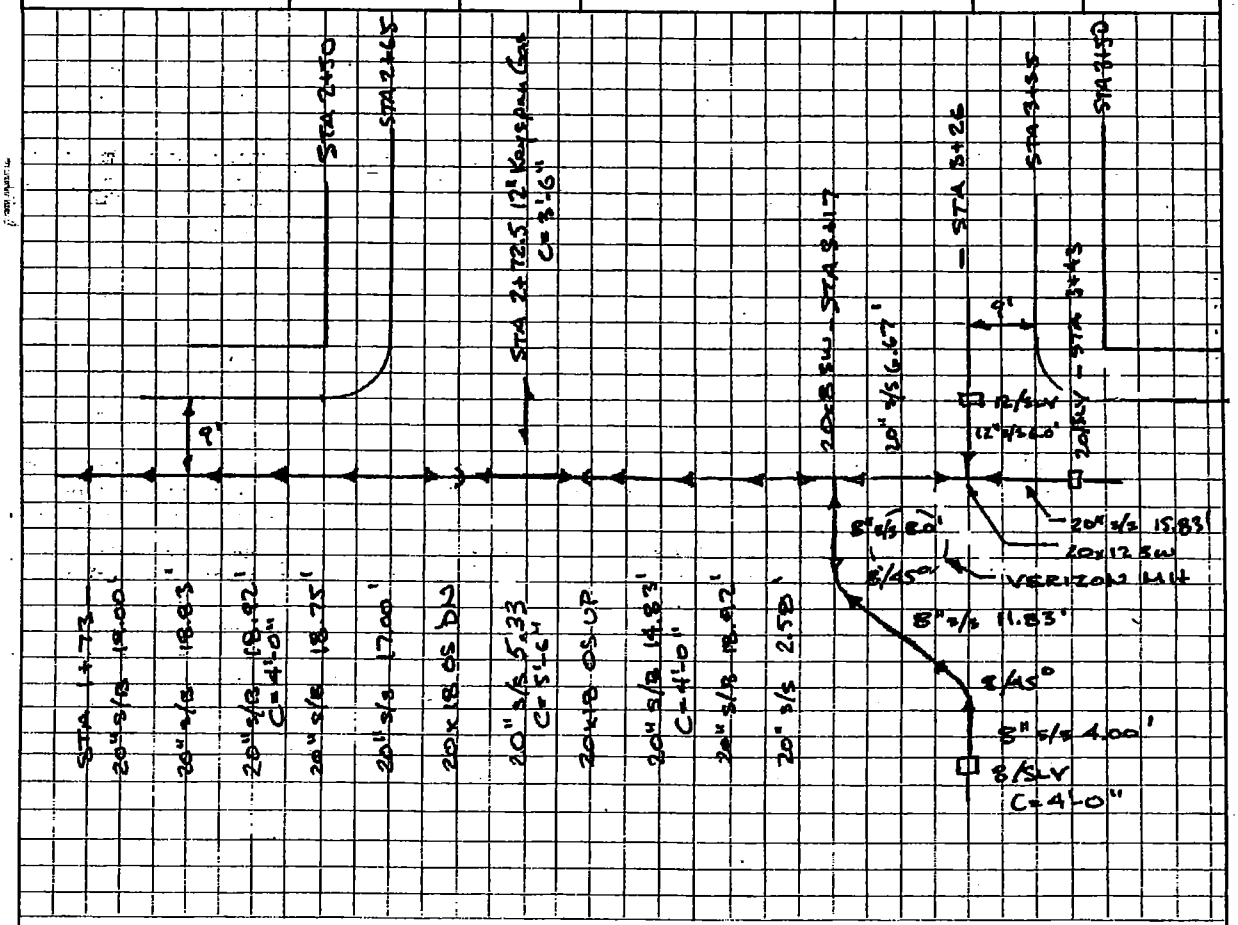
Date: Apr 17, 2003

Day of week: S M T W T F S

I.R. No.: 59

Sheet No. 5 of 5

ADDRESS	PIPE SIZE	COVER	LOCATION			
79-04	1½"	4'-0"	STA 2+25 25' E/OF WBL	2"cu	2"lead	3'-6"cu



☐ additional sketches on page 4

The above described work was incorporated into this project and was inspected by:

Inspector's Signature | Reviewed By | Project Engineer's Signature | Date

AR

Page 1 of 1

Distribution Water Main Payment Calculation Worksheet

Contract No.: SEQ-002563 Prepared By: Al Smith Date: 4/18/03

Nominal Pipe Size: 20" Checked By: _____ Date: _____

Date	DIP Straight (LF)	Pipe Fittings & Wedge Type Retainer Glands						Utility Offset - Theoretical Work				Payment Item Totals by Line		
		Mechanical Joint Fitting Description	Bare Fitting Wt. (lbs)	Fitting Lay Length (LF)	Allowance (LF)	Wedge Type Retainer Glands (No./Size)	Total WRG Wt. (lbs)	Utility Co.	F/D DIP (LF)	Lay (LF)	F/MJ Fittings & WRG (lbs)	F/D DIP (LF)	Lay (LF)	F/MJ Fittings & WRG (lbs)
A	B	C1	C2	C3	C4	D1	D2	E1	E2	E3	E4	F	G	H
4/17	19.00											19.00	19.00	0
	18.83											18.83	18.83	0
	18.92											18.92	18.92	0
	18.75											18.75	18.75	0
	17.00											17.00	17.00	0
		20x18 OS	1190	4.33	2	2/20	149.6	Gas Keyspan	0	0	0	0	0	0
	5.33							"	0	0	0	0	0	0
		20x18 OS	1190	4.33	2	2/20	149.6	"	0	0	0	0	0	0
	14.83											14.83	14.83	0
	18.92											18.92	18.92	0
	2.58											2.58	2.58	0
		20x8 3W	735	3.75	3	2/20+1/8	165.6	Verizon	2.33	2.33	0	2.33	2.33	900.6
	6.67							"	6.67	6.67		6.67	6.67	0
		20x12 3W	775	3.75	3	2/20 & 1/12	182.3	"	0	9.17	1075 (20x12 4W)	0	9.17	1075.0
	15.83											15.83	15.83	0
		20/SLV	325	0	2	2/20	149.6					0	2.00	474.6
									DAY TOTAL		4/17	153.66	164.83	2450.2

Page 1 of 1

Distribution Water Main Payment Calculation Worksheet

Contract No.: SEQ-002563 Prepared By: Al Smith Date: 4/18/03

Nominal Pipe Size: 12 Checked By: _____ Date: _____

Date	DIP Straight (LF)	Pipe Fittings & Wedge Type Retainer Glands						Utility Offset - Theoretical Work				Payment Item Totals by Line		
		Mechanical Joint Fitting Description	Bare Fitting Wt. (lbs)	Fitting Lay Length (LF)	Allowance (LF)	Wedge Type Retainer Glands (No./Size)	Total WRG Wt. (lbs)	Utility Co.	F/D DIP (LF)	Lay (LF)	F/ MJ Fittings & WRG (lbs)	F/D DIP (LF)	Lay (LF)	F/ MJ Fittings & WRG (lbs)
A	B	C1	C2	C3	C4	D1	D2	E1	E2	E3	E4	F	G	H
4/17	6.00											6.00	6.00	0
		12/SLV	145	0	2		65.4					0	2.00	210.4
*								Verizon	2.00	2.00	0	2.00	2.00	0
*								Verizon	0	3.17	12=8.200 213.70	0	3.17	213.70
									DAY	TOTAL	4/17	8.00	13.17	424.10

Page 1 of 1

Distribution Water Main Payment Calculation Worksheet

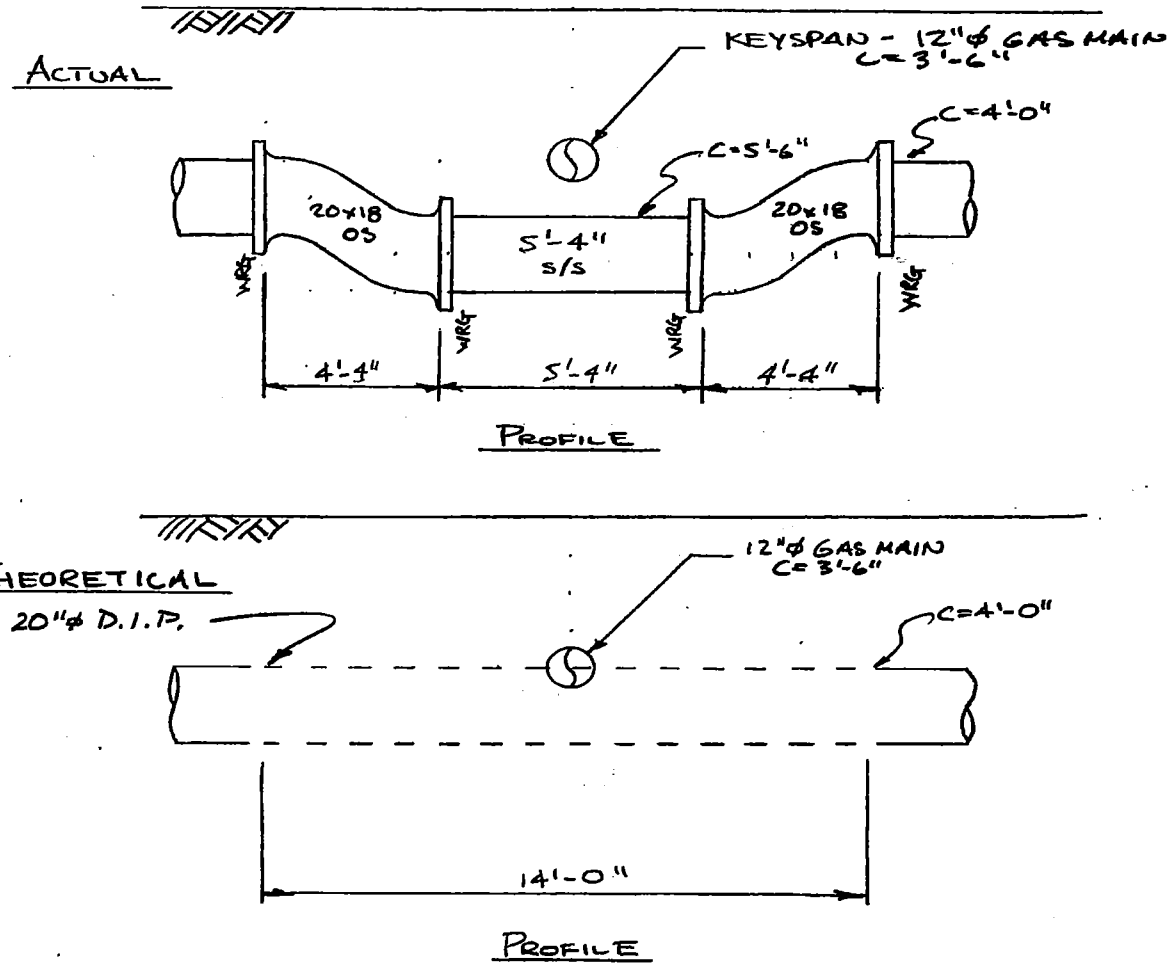
Contract No.: SEQ-002563 Prepared By: Al Smith Date: 4/18/03

Nominal Pipe Size: 8 Checked By: Date:

Date	DIP Straight (LF)	Pipe Fittings & Wedge Type Retainer Glands						Utility Offset - Theoretical Work				Payment Item Totals by Line		
		Mechanical Joint Fitting Description	Bare Fitting Wt. (lbs)	Fitting Lay Length (LF)	Allowance (LF)	Wedge Type Retainer Glands (No./Size)	Total WRG Wt. (lbs)	Utility Co.	F/D DIP (LF)	Lay (LF)	F/ MJ Fittings & WRG (lbs)	F/D DIP (LF)	Lay (LF)	F/ MJ Fittings & WRG (lbs)
A	B	C1	C2	C3	C4	D1	D2	E1	E2	E3	E4	F	G	H
4/17	8.00							Verizon	4.83	4.83	0	4.83	4.83	0
		8/45°	110	0.92	2	2/8	32.0	Verizon	0.78	0.78	0	0.78	0.78	0
	11.83							Verizon	8.36	8.36	0	8.36	8.36	0
		8/45°	110	0.92	2	2/8	32.0	Verizon	0.78	0.78	0	0.78	0.78	0
	4.00											4.00	4.00	0
		8/SLV	85	0	2	2/8	32.0					0	2.00	117.0
									DAY TOTAL		4/17	18.75	20.75	117.0

Sample Payment Calculation

SEQ-002563 // INT. OF PENELOPE AVE. & 79th STR.

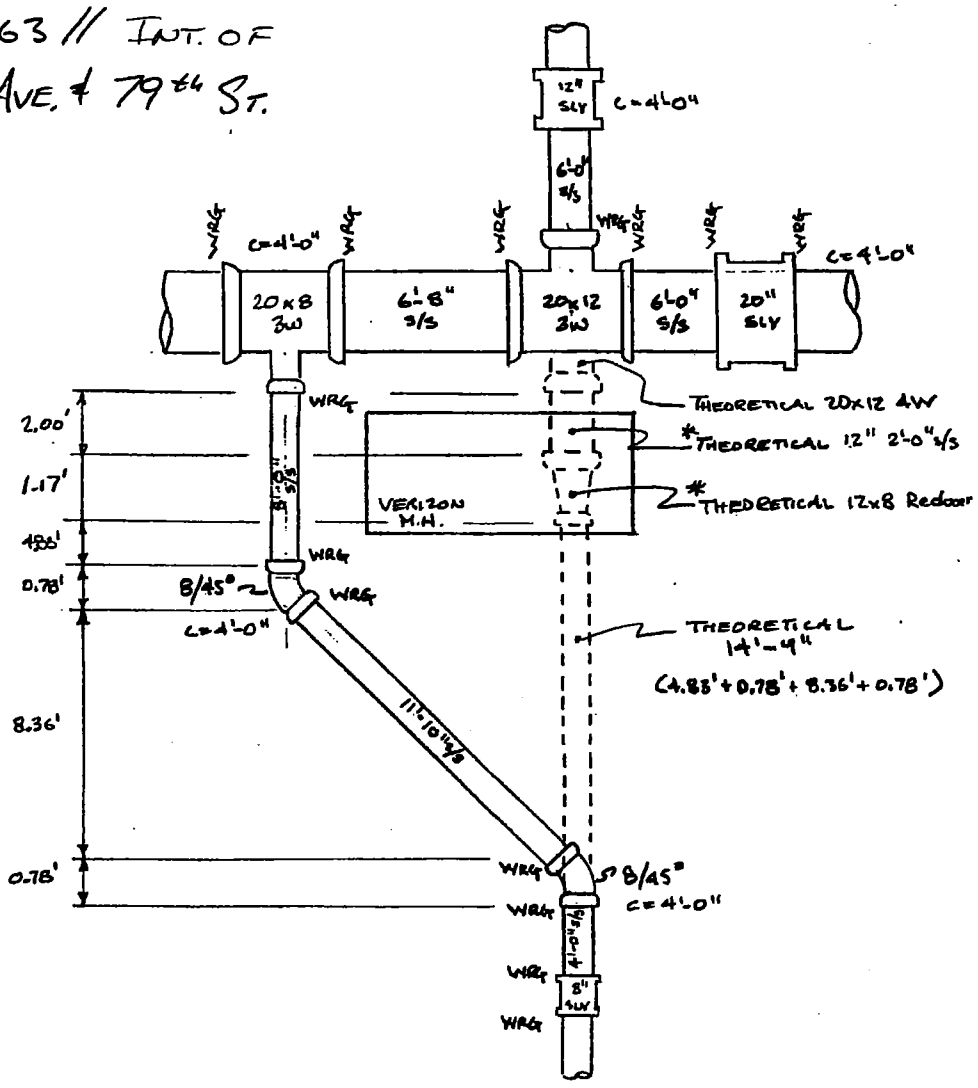


PAYMENT UNDER "WATER MAIN ACCOMMODATIONS":

F/D 20-inch DIP - $47/LF x (5.33) =	$	250.51
Lay 20-inch DIP & Fittings - $55/LF x [(5.33 + 2 x (4.33 +2)] =	$	989.45
F/ Fittings & WRG - $2,300/TN x TN/2000LB x 2 x (1190 + 149.6) =	$	3,081.08
Excavation Outside Trench Limits - $30/CY x CY/27CF x 3.67' x 1.50' x (6.0' + 2 x 0.5 x 4.0') =	$	61.67
F/P Temporary Tight Sheeting - $0.25/SF x 2 [(6'+2(0.5 x 4')(5.5 + 2.17) + 2 (0.5 x 4.0')(4 + 2.17)] =	$	50.69
Total for "Water Main Accommodations"	**$**	**4,433.40**

Sample Payment Calculation

SEQ-002563 // INT. OF PENELOPE AVE. & 79TH ST.



Sample Payment Calculation

Payments Quantities Reported for April 16, 2003:

Item No.	Item Description	Unit	Quantity
WM-025	F/D 20-inch DI Restrained Joint Pipe	LF	195.74
WM-027	F/D 12-inch DI Restrained Joint Pipe	LF	0.00
WM-028	F/D 8-inch DI Restrained Joint Pipe	LF	0.00
WM-029	F/D 6-inch DI Restrained Joint Pipe	LF	8.83
WM-036	F/D/I DI, MJ Fittings w/ Wedge Type Retainer Glands	TONS	0.66
WM-041	Laying 20-inch DI Pipe & Fittings	LF	206.32
WM-043	Laying 12-inch DI Pipe & Fittings	LF	1.00
WM-044	Laying 8-inch DI Pipe & Fittings	LF	0.00
WM-045	Laying 6-inch DI Pipe & Fittings	LF	8.83
WM-091	F/D/I 20-inch MJ, DI Gate Valve w/ Wedge Type Retainer Glands	EA	1.00
WM-094	F/D/I 6-inch MJ, DI Gate Valve w/ Wedge Type Retainer Glands	EA	1.00
WM-144	F/D Various Castings Incl. But Not Limited To 24-inch MH Skirts, Heads & Covers, & Hydrant Valve Box, etc.	TONS	0.90
WM-149	F/D Hydrants	EA	1.00
WM-150	Setting Hydrants Complete w/ Wedge Type Retainer Glands	EA	1.00
WM-164	Withdraw & Replacing House Services Using 1½-inch Or Larger Screw Taps	EA	1.00
WM-179	Extending House Services (Pipe Less Than 3-inch Diameter)	LF	0.00
WM-198	Furnishing & Placing Temporary Tight Sheeting	SF	2,879
WM-206	Excavation Required Outside The Pipe Trench (Including the Excavation and Disposal of Pavement)	CY	0.00
UTL-6.01.9	Gas Main Crossing Water Main Up To 20-inch In Diameter (S6.01)	EA	0.00
UTL-GCS-2	Water Main Accommodations - Gas Cost Sharing, General Provision Paragraph No.2	F.S.	$0.00

Sample Payment Calculation

Payments Quantities Reported for April 17, 2003:

Item No.	Item Description	Unit	Quantity
WM-025	F/D 20-inch DI Restrained Joint Pipe	LF	153.66
WM-027	F/D 12-inch DI Restrained Joint Pipe	LF	8.00
WM-028	F/D 8-inch DI Restrained Joint Pipe	LF	18.75
WM-029	F/D 6-inch DI Restrained Joint Pipe	LF	0.00
WM-036	F/D/I DI, MJ Fittings w/ Wedge Type Retainer Glands	TONS	1.50
WM-041	Laying 20-inch DI Pipe & Fittings	LF	164.83
WM-043	Laying 12-inch DI Pipe & Fittings	LF	13.17
WM-044	Laying 8-inch DI Pipe & Fittings	LF	20.75
WM-045	Laying 6-inch DI Pipe & Fittings	LF	0.00
WM-091	F/D/I 20-inch MJ, DI Gate Valve w/ Wedge Type Retainer Glands	EA	0.00
WM-094	F/D/I 6-inch MJ, DI Gate Valve w/ Wedge Type Retainer Glands	EA	0.00
WM-144	F/D Various Castings Incl. But Not Limited To 24-inch MH Skirts, Heads & Covers, & Hydrant Valve Box, etc.	TONS	0.00
WM-149	F/D Hydrants	EA	0.00
WM-150	Setting Hydrants Complete w/ Wedge Type Retainer Glands	EA	0.00
WM-164	Withdraw & Replacing House Services Using 1½-inch Or Larger Screw Taps	EA	1.00
WM-179	Extending House Services (Pipe Less Than 3-inch Diameter)	LF	0.00
WM-198	Furnishing & Placing Temporary Tight Sheeting	SF	2,349
WM-206	Excavation Required Outside The Pipe Trench (Including the Excavation and Disposal of Pavement)	CY	0.00
UTL-6.01.9	Gas Main Crossing Water Main Up To 20-inch In Diameter (S6.01)	EA	1.00
UTL-GCS-2	Water Main Accommodations - Gas Cost Sharing, General Provision Paragraph No.2	F.S.	$4,433.40

REFERENCE MATERIAL

Condensed Version of Commonly Used ANSI/AWWA C110/A21.10 Mechanical Joint Bell End Fittings with EBBA MegaLug Weights

Nominal Size (inches)	Mechanical Joint Fitting Description	Bare Fitting Wt. (lbs)	Number of Wedge Type Retainer Glands per Fitting				Total WRG Wt. (lbs)	Total Weight (lbs)
			6-inch	8-inch	12-inch	20-inch		
6	6/90 Bend	85.00	2				24.00	109.00
6	6/45 Bend	75.00	2				24.00	99.00
6	6/22.5 Bend	75.00	2				24.00	99.00
6	6/11.25 Bend	75.00	2				24.00	99.00
6	6x6 3W	125.00	3				36.00	161.00
6	6x6 4W	160.00	4				48.00	208.00
6	6x12 OS	135.00	2				24.00	159.00
6	6x18 OS	165.00	2				24.00	189.00
6	6/SLV	65.00	2				24.00	89.00
6	6/CAP	25.00	1				12.00	37.00
6	6/PLUG	25.00					0.00	25.00
8	8/90 Bend	125.00		2			32.00	157.00
8	8/45 Bend	110.00		2			32.00	142.00
8	8/22.5 Bend	110.00		2			32.00	142.00
8	8/11.25 Bend	110.00		2			32.00	142.00
8	8x8 3W	185.00		3			48.00	233.00
8	8x6 3W	175.00	1	2			44.00	219.00
8	8x8 4W	235.00		4			64.00	299.00
8	8x6 4W	205.00	2	2			56.00	261.00
8	8x12 OS	200.00		2			32.00	232.00
8	8x18 OS	245.00		2			32.00	277.00
8	8x6 RD	95.00	1	1			28.00	123.00
8	8/SLV	85.00		2			32.00	117.00
8	8/CAP	45.00		1			16.00	61.00
8	8/PLUG	45.00					0.00	45.00
12	12/90 Bend	255.00			2		65.40	320.40
12	12/45 Bend	215.00			2		65.40	280.40
12	12/22.5 Bend	220.00			2		65.40	285.40
12	12/11.25 Bend	220.00			2		65.40	285.40
12	12x12 3W	410.00			3		98.10	508.10
12	12x8 3W	340.00		1	2		81.40	421.40
12	12x6 3W	325.00	1		2		77.40	402.40
12	12x12 4W	495.00			4		130.80	625.80
12	12x8 4W	385.00		2	2		97.40	482.40
12	12x6 4W	360.00	2		2		89.40	449.40
12	12x12 OS	420.00			2		65.40	485.40
12	12x18 OS	520.00			2		65.40	585.40
12	12x8 RD	165.00		1	1		48.70	213.70
12	12x6 RD	150.00	1		1		44.70	194.70
12	12/SLV	145.00			2		65.40	210.40
12	12/CAP	80.00			1		32.70	112.70
12	12/PLUG	85.00					0.00	85.00

Condensed Version of Commonly Used ANSI/AWWA C110/A21.10 Mechanical Joint Bell End Fittings with EBBA MegaLug Weights (cont'd)

Nominal Size (inches)	Mechanical Joint Fitting Description	Bare Fitting Wt. (lbs)	Number of Wedge Type Retainer Glands per Fitting				Total WRG Wt. (lbs)	Total Weight (lbs)
			6-inch	8-inch	12-inch	20-inch		
20	20/90 Bend	**680.00**				2	**149.60**	**829.60**
20	20/45 Bend	**530.00**				2	**149.60**	**679.60**
20	20/22.5 Bend	**535.00**				2	**149.60**	**684.60**
20	20/11.25 Bend	**540.00**				2	**149.60**	**689.60**
20	20x20 3W	**1020.00**				3	**224.40**	**1244.40**
20	20x12 3W	**775.00**			1	2	**182.30**	**957.30**
20	20x8 3W	**735.00**		1		2	**165.60**	**900.60**
20	20x6 3W	**725.00**	1			2	**161.60**	**886.60**
20	20x20 4W	**1230.00**				4	**299.20**	**1529.20**
20	20x12 4W	**860.00**			2	2	**215.00**	**1075.00**
20	20x8 4W	**790.00**		2		2	**181.60**	**971.60**
20	20x6 4W	**760.00**	2			2	**173.60**	**933.60**
20	20x12 RD	**405.00**			1	1	**107.50**	**512.50**
20	20/SLV	**325.00**				2	**149.60**	**474.60**
20	20/CAP	**240.00**				1	**74.80**	**314.80**
20	20/PLUG	**225.00**					**0.00**	**225.00**

Condensed Version of Commonly Used Non-Standard Mechanical Joint Bell End Fittings with EBBA MegaLug Weights

Nominal Size (inches)	Mechanical Joint Fitting Description	Bare Fitting Wt. (lbs)	Number of Wedge Type Retainer Glands per Fitting				Total WRG Wt. (lbs)	Total Weight (lbs)
			6-inch	8-inch	12-inch	20-inch		
6	6x24 OS (L=24")	**165.00**	2				**24.00**	**189.00**
8	8x24 OS (L=36")	**280.00**		2			**32.00**	**312.00**
12	12x24 OS (L=48")	**640.00**			2		**65.40**	**705.40**
20	20x12 OS (L=40")	**1036.00**				2	**149.60**	**1185.60**
20	20x18 OS (L=52")	**1190.00**				2	**149.60**	**1339.60**
20	20x24 OS (L=52")	**1246.00**				2	**149.60**	**1395.60**

REFERENCE MATERIAL

Condensed Version of Commonly Used ANSI/AWWA C110/A21.10 Mechanical Joint Bell End Fittings Lay Lengths & Allowances

Nominal Size (inches)	Mechanical Joint Fitting Description	Fitting Lay Length & Allowances as Specified by Article 28 of "Standard Water Main Specifications General Conditions							
		6-inch		8-inch		12-inch		20-inch	
		Lay Length (feet)	Allowance (feet)	Lay Length (feet)	Allowance (feet)	Lay Length (feet)	Allowance (feet)	Lay Length (feet)	Allowance (feet)
6	6/90 Bend	1.33	2.00						
6	6/45 Bend	0.83	2.00						
6	6/22.5 Bend	0.83	2.00						
6	6/11.25 Bend	0.83	2.00						
6	6x6 3W	2.00	3.00						
6	6x6 4W	2.67	4.00						
6	6x12 OS	2.17	2.00						
6	6x18 OS	2.75	2.00						
6	6/SLV	0.00	2.00						
6	6/CAP	0.00	1.00						
6	6/PLUG	0.00	1.00						
8	8/90 Bend			1.50	2.00				
8	8/45 Bend			0.92	2.00				
8	8/22.5 Bend			0.92	2.00				
8	8/11.25 Bend			0.92	2.00				
8	8x8 3W			2.25	3.00				
8	8x6 3W			2.25	3.00				
8	8x8 4W			3.00	4.00				
8	8x6 4W			3.00	4.00				
8	8x12 OS			2.33	2.00				
8	8x18 OS			2.92	2.00				
8	8x6 RD			0.92	2.00				
8	8/SLV			0.00	2.00				
8	8/CAP			0.00	1.00				
8	8/PLUG			0.00	1.00				
12	12/90 Bend					2.00	2.00		
12	12/45 Bend					1.25	2.00		
12	12/22.5 Bend					1.25	2.00		
12	12/11.25 Bend					1.25	2.00		
12	12x12 3W					3.00	3.00		
12	12x8 3W					3.00	3.00		
12	12x6 3W					3.00	3.00		
12	12x12 4W					4.00	4.00		
12	12x8 4W					4.00	4.00		
12	12x6 4W					4.00	4.00		
12	12x12 OS					3.08	2.00		
12	12x18 OS					4.00	2.00		
12	12x8 RD					1.17	2.00		
12	12x6 RD					1.17	2.00		
12	12/SLV					0.00	2.00		
12	12/CAP					0.00	1.00		

REFERENCE MATERIAL

Condensed Version of Commonly Used ANSI/AWWA C110/A21.10 Mechanical Joint Bell End Fittings Lay Lengths & Allowances

Nominal Size (inches)	Mechanical Joint Fitting Description	Fitting Lay Length & Allowances as Specified by Article 28 of "Standard Water Main Specifications General Conditions							
		6-inch		8-inch		12-inch		20-inch	
		Lay Length (feet)	Allowance (feet)	Lay Length (feet)	Allowance (feet)	Lay Length (feet)	Allowance (feet)	Lay Length (feet)	Allowance (feet)
12	12/PLUG					0.00	1.00		
20	20/90 Bend							3.00	2.00
20	20/45 Bend							1.58	2.00
20	20/22.5 Bend							1.58	2.00
20	20/11.25 Bend							1.58	2.00
20	20x20 3W							4.50	3.00
20	20x12 3W							3.75	3.00
20	20x8 3W							3.75	3.00
20	20x6 3W							3.75	3.00
20	20x20 4W							6.00	4.00
20	20x12 4W							5.17	4.00
20	20x8 4W							5.17	4.00
20	20x6 4W							5.17	4.00
20	20x12 RD							1.67	2.00
20	20/SLV							0.00	2.00
20	20/CAP							0.00	1.00
20	20/PLUG							0.00	1.00

Condensed Version of Commonly Used Non-Standard Mechanical Joint Bell End Fittings Lay Lengths & Allowances

Nominal Size (inches)	Mechanical Joint Fitting Description	Fitting Lay Length & Allowances as Specified by Article 28 of "Standard Water Main Specifications General Conditions							
		6-inch		8-inch		12-inch		20-inch	
		Lay Length (feet)	Allowance (feet)	Lay Length (feet)	Allowance (feet)	Lay Length (feet)	Allowance (feet)	Lay Length (feet)	Allowance (feet)
6	6x24 OS (L=24")	2.00	2.00						
8	8x24 OS (L=36")			3.00	2.00				
12	12x24 OS (L=48")					4.00	2.00		
20	20x12 OS (L=40")							3.33	2.00
20	20x18 OS (L=52")							4.33	2.00
20	20x24 OS (L=52")							4.33	2.00

REFERENCE MATERIAL

Series 1100 MEGALUG® Mechanical Joint Restraint
SAMPLE SPECIFICATIONS

RESTRAINT INCORPORATED INTO THE DESIGN OF THE FOLLOWER GLAND
- Gland body and restraint components made from minimum ASTM A536, 60-42-10 ductile iron
- Available 3 inch through 48 inch
- Conventional installation procedures per AWWA C-600
- Can be used with the standardized mechanical joint bell conforming to ANSI/AWWA C111 A21.11 and ANSI/AWWA C153/A21.53 of the latest revision
- Capable of full mechanical joint deflection during assembly
- Capable of joint deflection after assembly

MULTIPLE, WEDGE STYLE RESTRAINT MECHANISM
- Proper actuation ensured with torque limiting twist off nuts
- Ductile iron wedges heat treated to range of 370 to 470 BHN

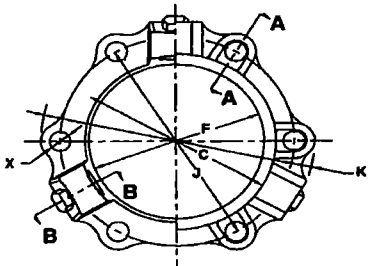
PROOF TESTED
- 3 inch through 16 inch pressure rated at 350 psi. 18 inch through 48 inch rated at 250 psi
- Minimum safety factor of 2 to 1
- Listed by Underwriters Laboratories 3" through the 24" inch size
- Approved by Factory Mutual up through the twelve inch size
- Minimum weights per the following table

SUPPORT PRODUCTS AVAILABLE
- Split repair style available 3 inch through 48 inch
- Solid restraint harness available for push-on pipe bells
- Split restraint harness available for existing push-on pipe bells

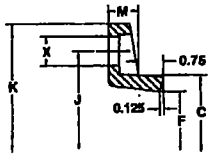
MUST BE SERIES 1100, MEGALUG® AS PRODUCED BY EBAA IRON, INC. OR APPROVED EQUAL.
- All components cast and assembled in the United States by same company with plant visitation available
- Must have a record of a minimum of seven years of manufacturing and sales of the restraint in the United States

DIMENSIONS AND RATINGS

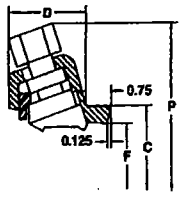
SERIES	NOMINAL PIPE SIZE	C	D	F	M	P (With Nuts Off)	X	J	K	WEDGES QTY	BOLTS QTY	WT LBS	PRESS RATING
1103	3"	4.48	2.27	4.06	0.62	9.06	0.750	6.19	7.69	2	4	6.1	350
1104	4"	5.92	2.27	4.90	0.75	9.90	0.875	7.50	9.12	2	4	7.2	350
1106	6"	8.02	2.27	7.00	0.88	12.00	0.875	9.50	11.12	3	6	12.0	350
1108	8"	10.17	2.31	9.15	1.00	14.15	0.875	11.75	13.37	4	6	16.0	350
1110	10"	12.22	2.37	11.20	1.00	16.20	0.875	14.00	15.62	6	8	24.9	350
1112	12"	14.32	2.37	13.30	1.25	18.30	0.875	16.25	17.88	8	8	32.7	350
1114	14"	16.40	2.69	15.44	1.50	20.94	0.875	18.75	20.25	10	10	49.7	350
1116	16"	18.50	2.69	17.54	1.56	22.90	0.875	21.00	22.50	12	12	58.2	350
1118	18"	20.60	2.69	19.64	1.63	25.00	0.875	23.25	24.75	12	12	62.2	250
1120	20"	22.70	2.69	21.74	1.69	27.10	0.875	25.50	27.00	14	14	74.8	250
1124	24"	26.90	3.20	25.94	1.81	32.64	0.875	30.00	31.50	16	16	138.8	250
1130	30"	33.29	3.20	32.17	2.25	38.87	1.125	36.88	39.12	20	20	195.4	250
1136	36"	39.59	3.20	38.47	2.25	45.17	1.125	43.75	46.00	24	24	256.5	250
1142	42"	45.79	4.56	44.67	3.88	55.57	1.375	50.62	53.48	28	28	510.2	250
1148	48"	52.09	4.56	50.97	3.88	61.87	1.375	57.50	60.36	32	32	712.0	250



REAR VIEW FRONT VIEW



SECTION A - A



SECTION B - B

- For test pressures above the rated pressures shown, consult the EBAA Engineering Dept for recommendations. For projects using large diameter restraints, please contact this office for our design recommendations.
- **The 1100 Series should not be used on plain end fittings.**
- If you experience the need to install the 1110 Series in an unconventional manner please consult our engineering department.
- The 1100 Series is intended for use on ductile iron pipe. The restraint can be used on grey iron pipe if the pipe is not severely corroded and is in sound condition and has an outside diameter that can be accommodated. For more information on the use of the MEGALUG restraint on grey iron pipe ask for ***Connections Bulletin*** **DI-1**.
- EBAA Seal Gaskets are provided with the 30" through 48" MEGALUG restraints. Extra length T-bolts are provided with the 42" and 48" sizes to facilitate easier assembly of the mechanical joint. These are required on the above referenced sizes to obtain the pressure ratings and safety factors shown.
- All MEGALUG components are made of ductile iron. The wedges are heat treated to a hardness range of 370 to 470 BHN. The product is coated with the same asphaltic coating specified for the pipe and fittings.
- **LISTINGS AND APPROVALS** Sizes 3" through 24" are listed by Underwriters Laboratories, Inc., Category HJKF "Fittings, Retainer Type," with a deflection angle of 5 degrees (3" through 12") and 2-1/2 degrees (14" through 24".) The listing file number is EX2836. Sizes 3" through 12" are Factory Mutual approved.

EBAA IRON™
EBAA IRON SALES, INC.
"Your Connection to the Future"™

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800-433-1716 FAX 254-629-8931
ebaa@eastland.net Visit our Web Site: www.ebaa.com

AWWA C500 – Double Disc Gate Valves with Mechanical Joint Ends & NRS

Nominal Diameter (inches)	Lay Length (inches)
6	5.25
8	6.50
12	7.00
20	10.00

AWWA C509 – Resilient Wedge Valves with Mechanical Joint Ends & NRS

Nominal Diameter (inches)	Lay Length (inches)
6	5.00
8	5.50
12	8.00
20	11.00

REFERENCE MATERIAL

Standard Weights for Cast Iron Castings

Casting Description	Drawing No.	Acceptable Weight (LBS)		
		Minimum*	Standard	Maximum**
Valve Box Skirt	10240-A-Z	446	485	509
Manhole Head (12-inch Deep)	10240-A-Z & 13547-B-Z	472	513	539
Manhole Head (6-inch Deep)	10240-A-Z & 13547-B-Z	383	416	437
24-inch Manhole Cover	10240-A-Z & 13547-B-Z	208	226	237
Hydrant Valve Box - Upper Part	10241-A-Z	108	120	126
Hydrant Valve Box - Lower Part	10241-A-Z	117	130	137
Hydrant Valve Box - Cover	10241-A-Z	43	48	50
Hydrant Drain Basin	22809-Z	229	270	284

Notes:

1. If the contractor fails to document shipping weights pay the minimum. The castings are weighed and marked at the plant with white paint.

* Castings with weights less than this are not acceptable.

** This is the maximum weight paid. Castings with weights greater than this are acceptable.