

MEMO

To:	Mayor	
	City Council	
	City Manager	
From:	Nica J. Westerling, City Engineer	
	Construction Inspection	
Date:	May 6, 2008	
Subject:	List of changes to the 2008 Technical Specifications and Construction	
	Standards	

The Public Works Department reviews and revises the Technical specifications and Construction Standards each year prior to the issuance of the Annual Street and Utilities Maintenance Contracts. Any changes or modifications to improve operations or to clarify the standards to be better understood by those using them. The following is a list of recommended changes to the Technical Specifications and Construction Standards for 2008. Please note that changes for 2008 are **bolded** whereas items requiring emphasis are <u>underlined</u>. The numbering sequence has been changed to co-relate with the APWA New Mexico Technical Specifications for Public Work Construction revised on December 2006.

1.	Section	101.5.1	Numbering sequence changed to 101.4.1
2.	Section	101.7.1	Numbering sequence changed to 101.6.1
3.	Section	101.12	Numbering sequence changed to 101.15
4.	Section	101.15	Numbering sequence changed to 101.16
5.	Section	105.1.3	Numbering sequence changed to 105.3.1
6.	Section	112.1	Numbering sequence changed to 112.4
7.	Section	116.3.4	Numbering sequence changed to 116.4.7
8.	Section	116.7.6	Numbering sequence changed to 116.7.3
9.	Section	116.7.7	Numbering sequence changed to 116.7.4
10.	Section	121.4.2	"All pressure sewer lines (mainlines and service) shall be installed
			with a tracer wire including yard lines" added
11.	Section	123.1	Numbering sequence changed to 123.1.2
12.	Section	207.01	Numbering sequence changed to 301.01
13.	Section	207.03	Numbering sequence changed to 301.03
14.	Section	207.04	Numbering sequence changed to 301.7
15.	Section	207.05	Numbering sequence changed to 301.7.3.3
16.	Section	302.3.2	Numbering sequence changed to 302.3.1.1
17.	Section	302.5	Numbering sequence changed to 302.6

18.	Section	336.12.2	Numbering sequence changed to 336.11.2
19.	Section	340.5.5	Numbering sequence changed to 340.5.4
20.	Section	343.5.3	Numbering sequence changed to 343.4 and "Disposal" added to title
21	Section	343 5	"Measurement and Payment" section added "replaced or when use
21.	Section	515.5	of a laydown machine is required" added to explain when asphalt
			removal is paid for
22	Section	410 3 3 1	Numbering sequence changed to 410 3 3 1 3
23	Section	410.6.1.1	Numbering sequence changed to 410.6
23. 24	Section	440	Numbering changed to 451
25	Section	440 1	Numbering changed to 451 1
26	Section	440 1 1	Numbering changed to 451.1
20. 27	Section	440.1.2	Numbering changed to 451.1.1
27.	Section	440.1.3	Numbering changed to 451.1.2
20. 29	Section	440 1 4	Numbering changed to 451.1.9
30	Section	440.2	Numbering changed to 451.2
31	Section	440.4.1	Numbering changed to 451.4 1
32	Section	440 5	Numbering changed to 451.5
33	Section	440.6	Numbering changed to 451.6
34	Section	440.6.1	Numbering changed to 451.6 1
35	Section	440.6.2	Numbering changed to 451.6.2
36	Section	440.6.3	Numbering changed to 451.6.2
37	Section	440 6 4	Numbering changed to 451 6 4
38	Section	440.6.5	Numbering changed to 451.6.5
39	Section	440.6.6	Numbering changed to 451.6.6
40	Section	440 7	Numbering changed to 451.7
41	Section	440.8	Numbering changed to 451.8
42	Section	603 3	Numbering sequence changed to 603 3 3
43	Section	701.6.8	Numbering sequence changed to 701 6
44	Section	701.8	Numbering sequence changed to 701.8 9
45	Section	701 12 2	Numbering sequence changed to 701.14
46	Section	801 3 7 3 5	Numbering sequence changed to 801 3 6 1
47	Section	801 3 8 1	Numbering sequence changed to 801.3.7 a fourth approved fire
• • •	Section	001.2.0.1	hydrant manufacturer added and paragraph on double steamer
			hydrant and inspection added
48	Section	801 15	New section on salvaged materials added
49	Section	801 22 18	Numbering sequence changed to 801 22 15
50	Section	802.8.4.1	Numbering sequence changed to 801.6
51	Section	802.8.5	Numbering sequence changed to 802.8 4
52	Sections	901 5 2 7 2	runioenng sequence enunged to co2.0.1
02.	and	901 5 2 1	Switched to correct order
53	Section	901 5 2 1	"mainlines or service lines" added
54	Section	901 5 2 7 2	"D Pressure sewers shall be buried a minimum of 60" measured
	~~~~		from finish grade to top of pipe" added
55	Section	901 9 6	Numbering sequence changed to 901 8 3
56	Section	970	Section number and title changed to 971 - Sewer Mainline Repairs

56. Section 970.1 Numbering sequence changed to 971.1, service connection replaced by line, concrete encasement replaced by sewer pipe, "settled" deleted, "replaced with insert a tee" deleted
57. Section 970.2 Numbering sequence changed to 971.2, Service replaced by mainline, "slipped taps" removed, service replaced by mainline

The following is a list of recommended changes to the Construction Standards Sheet Indexes in the Technical Specifications and Construction Standards for 2008. The title block on all drawings has been changed from "COMMUNITY DEVELOPMENT DEPARTMENT" to "PUBLIC WORKS DEPARTMENT".

1.	D-102	Standard Manhole Type "B" - Deleted Reference to D-312
2.	D-103	Drop Manhole Type "D" - Added "stainless steel straps"
3.	D-104	Standard Manhole Type "E" - Deleted Reference to D-312
4.	D-105	Sewer Service at Dead Ends & Cul-de-sacs - Spelling Correction
5.	D-109	Tap Saddle Connections - Added "under the tap and 45° bend"
6.	D-110	Slip Liner Tap Connections - Added "under the tap and 45° bend"
7.	D-111	Trench Cuts (Manholes) Trench Widths - Spelling correction under Notes
		and added "base course" to 6" residential and 12" arterial
8.	D-112	Trench Details – Trench Pay Width (Sheet 1 of 3) – Added "6" of base
		course" to Note 1 and change "within" to Note 3
9.	D-112	Trench Details – Trench Pay Width (Sheet 2 of 3) – Wording change
		under Note: 1
10.	D-112	Trench Details – Trench Pay Width (Sheet 3 of 3) – Spelling correction
		under Notes
11.	D-201	Water Line Connections Details
12.	D-203	Valve Installation
13.	D-204	Pressure Reducer Valve/Riser Detail (Sheet 1 of 3)
14.	D-204	Pressure Reducer Valve/Riser Detail (Sheet 2 of 3)
15.	D-204	Pressure Reducer Valve/Riser Detail (Sheet 3 of 3)
16.	D-206	Blow off Valve Assembly
17.	D-207	Fire Hydrant (Sheet 1 of 3)
18.	D-207	Double Steamer Fire Hydrant (Sheet 2 of 4) – New Drawing
19.	D-207	Fire Hydrant (Sheet 3 of 4) - Spelling correction in Note 4, the trust block
		is removed in drawing and "slab" is changed to "pad"
20.	D-207	Fire Hydrant (Sheet 4 of 4) - Changed concrete pad to 48 square inch and
		changed "slab" to "pad"
21.	D-208	Air Relief valve Assembly – 6" thru 12" Pipe
22.	D-209	Air Relief Valve Assembly – 16" Pipe or Larger
23.	D-210	Thrust Blocks (Sheet 1 of 2) - Replaced City Engineer with Water &
		Wastewater Administrator
24.	D-210	Thrust Blocks (Sheet 2 of 2) - Replaced City Engineer with Water &
		Wastewater Administrator

25.	D-212	Water Line Location Markers - Spelling correction under note
26.	D-220	Water Service Connection (5/8" Meter)
27.	D-221	Water Service Connection (1" Meter)
28.	D-222	Water Service Connection (1 ¹ / ₂ " Meter)
29.	D-223	Water Service Connection (2" Meter)
30.	D-224	Water Service Manifold Detail
31.	D-302	Pedestrian Access Detail (Sheet 1 of 10) - Spelling correction
32.	D-302	Pedestrian Access Detail (Sheet 2 of 10) - Change in slopes
33.	D-302	Pedestrian Access Detail (Sheet 4 of 10) - Added the "1-1/2" min 38mm"
		to the handrail clearance detail
34.	D-302	Pedestrian Access Detail (Sheet 5 of 10) - Spelling correction
35.	D-302	Pedestrian Access Detail (Sheet 6 of 10) - Spelling correction
36.	D-302	Pedestrian Access Detail (Sheet 7 of 10) - Spelling correction
37.	D-302	Pedestrian Access Detail (Sheet 9 of 10) - Correction on Driveway-
		Setback Sidewalk Detail
38.	D-302	Pedestrian Access Detail (Sheet 10 of 10) - Additional annotations added
		to drawing
39.	D-306	Pavement Patching City Street (Sheet 1 of 2) - Spelling correction
40.	D-306	Pavement Patching City Street (Sheet 2 of 2) - Spelling correction
41.	D-311	Structure Adjustment (Sheet 2 of 2)
42.	D-313	Sidewalks and Paving Drive Pads - Wording on Note 4 changed
43.	D-314	Pavement Patching State Hwy. (Sheet 1 of 2) - State Highway deleted
		from title block and B.C. replaced with Type B or C
44.	D-314	Pavement Patching State Hwy. (Sheet 2 of 2) - Spelling correction and
		B.C. replaced with Type B or C
45.	D-319	Paving Residential Streets
46.	D-321	Paving Commercial Alley
47.	D-322	Paving Arterial or Collector with Median - Spelling correction
48.	D-323	Paving Arterial or Collector without Median - Spelling correction
49.	D-326	Scrupper Box - Replace drawing with a previous drawing
50.	D-401	General Utility Location (Sheet 2 of 2) - Addition of note to drawing
51.	D-402	Deleted sheet 1 of 2
52.	D-405	Pipeline Installation in Rock Areas - Spelling correction
53.	D-504	Curb Inlet Double
54.	D-506	Surface Inlet - Spelling correction
55.	D-507	Behind the Curb Catch Basin & Curb Inlet - Spelling correction
56.	D-513	Concrete Drainage Channel
57.	D-515	Storm Drain
58.	D-605	Grease Trap Detail
59.	D-607	Waterline Installation between Buildings - Addition of note to drawing
60.	D-612	Elevation Residential Drainage
61.	D-613	Diversion Dike – changed number to D-705
62.	D-614	Earth Dike - changed number to D-706
63.	D-615	Offsite tracking (2 Sheets) - changed number to D-707
64.	D-616	Sediment Basin - changed number to D-709
65.	D-617	Sediment Trap - changed number to D-710

66.	D-618	Slope Drain - changed number to D-703
67.	D-619	Surface Roughing - changed number to D-702
68.	D-620	Culvert Protection - changed number to D-701
69.	D-621	Curb Drop Inlet - changed number to D-712
70.	D-622	Drop Inlet Protection - changed number to D-713
71.	D-623	Silt Fence – 2 - changed number to D-711 Sheet 1 of 2
72.	D-624	Silt Fence – 1 - changed number to D-711 Sheet 2 of 2
73.	D-625	Stone Dam - changed number to D-704
74.	D-626	Straw Fence - changed number to D-714
75.	D-627	Temporary Erosion (2 Sheets) - changed number to D-700
76.	D-708	Fiber Rolls – New Drawing

A copy of the Technical Specification and Construction Standards are being transmitted to each City Council member separate from the City Council Meeting Agenda due to the size of the document.

**Staff Recommendation:** It is the recommendation of the City Engineering Division of the Public Works Department that the City Council approves the City of Farmington Construction Standards and Technical Specifications, dated May 2008 as revised and prepared by the City Engineering Staff.

**PURPOSE:** The technical specifications and construction standards in this document are an addendum to the <u>NEW MEXICO STANDARD SPECIFICATIONS FOR PUBLIC WORKS</u> <u>CONSTRUCTION, 1987</u> which serve to provide minimum standards to safeguard public welfare by regulating and controlling construction and quality of materials within this jurisdiction. The provisions of these standards shall apply to all construction, alteration and demolition within this jurisdiction. Where, in any specific case, different sections specify different materials, methods of construction, or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable.

#### **TECHNICAL SPECIFICATIONS**

<u>SECTION</u>	DESCRIPTION	PAGE
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212	Haul	212-1
302*	Base Course	302-1
306	Bituminous Stabilized Base	306-1
336*	Asphalt Concrete Pavement	336-1
340*	Cement Concrete Curbs, Gutters, Walks, Driveways, Alley, Intersections	340-1
343*	Removal and Disposal of Existing Pavement Curb, Gutter, Sidewalk, Drive Pads, and Slope Pavement	343-1

410*	Fence	410-1
440*	Work Area Traffic Control and Safety	440-1
510	Concrete Structures	510-1
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602	Portland Cement Surfacing	602-1
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701*	Trench Excavation & Backfill	701-1
710	Boring, Drilling, and Jacking	710-1
801*	Installation of Water Transmission & Distribution Lines	801-1
802*	Installation of Water Service Lines	802-1
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901*	Installation of Sanitary Sewer	901-1
905	Sanitary Sewer Service Line	905-1
920	Sanitary and Storm Drain Manholes	920-1
930	Manhole Connections	930-1
940	Pipe Laying (Rigid Pipe)	940-1
960	Slip line Removal	960-1
971*	Sewer Service Repair	971-1
1502	Mobilization	1502-1
1503	Restore Yards	1503-1

<u>GENERAL SPECIFICATIONS:</u> Unless specifically indicated otherwise, all work and materials for projects shall conform to the <u>New Mexico Standard Specifications for Public Works Construction</u>, 1987 Edition, as supplemented or changed herein and as noted above.

**NOTE**: **BOLDED ITEMS ARE CHANGES FOR 2008**, <u>UNDERLINED ITEMS ARE FOR EMPHASIS</u>. The numbering sequence has been changed to co-relate with the APWA New Mexico Technical Specifications for Public Work Construction revised on December 2006.

*Sections Changed

#### PORTLAND CEMENT CONCRETE

#### 101.3.1 PORTLAND CEMENT

Cement to be used under this contract shall be Type II unless otherwise specified.

#### 101.4.1 AGGREGATE GRADING

Unless otherwise specified, the coarse aggregate shall be Class (c) No. 67. 3/4 inch to No. 4.

#### 101.6.1 ADMIXTURES

All exterior concrete placed under this contract shall have air entrainment in the amounts specified under this paragraph.

#### Table 101 PORTLAND CEMENT CONCRETE PARAMETERS

Change the design strengths in Table 101 to the following: sidewalks and drivepads to 3000 psi; curb and gutter to 3000 psi; structural concrete to 4000 psi in 28 days. All valley gutters will achieve a minimum compressive strength of 3000 psi in 24 hours.

101.15 <u>TESTS</u> (Add the following paragraph)

The Engineer may require a reasonable number of additional tests during the progress of the work. Additional tests specimens cured entirely under field conditions may be required by the Engineer to check the adequacy of curing and protection of the concrete.

101.16 MEASUREMENT AND PAYMENT (Delete the section and add the following)

The cost of said Portland cement concrete will be included in related items of work and no separate measurement and payment shall be made for Portland cement concrete.

# CONCRETE CURING COMPOUND

# 105.3.1 <u>TYPE TWO COMPOUND</u> (Add the following)

All curing compound used under this contract shall be Type 1 "translucent, with red dye" or approved equal.

# **CEMENT MORTAR AND GROUT**

# 106.9.1MORTAR GROUT FOR MANHOLES(Add the following)

All cement mortar grout used for seating and securing manhole rings and covers or coating shall be category M meeting the required compressive strength of 3000 psi in 28 days.

# **RIPRAP STONE**

# 109.4 (Add the following)

The size of stone used under these specifications listed under table 109 shall be type L or M as approved by the City Engineer.

# PAVING ASPHALT

# 112.4 <u>TESTING REQUIREMENTS</u> (Add the following)

Liquid Asphalt Cement shall be P.G.58-28, P.G.64-22, PAC 20, or PAC 40 as designated by the City Engineer.

#### **EMULSIFIED ASPHALT**

# 113.1 <u>GENERAL</u> (add the following)

Emulsified Asphalt shall conform to the requirements of RS-2 or CRS-2 as shown in Tables 113.9 1 and 2 of Section 113.1 of the New Mexico Standard Specifications for Public Works Construction, 1987 or latest version.

#### ASPHALT CONCRETE

#### 116.4.7 <u>COMPOSITION AND GRADING</u>

Add the following to the section: The grading of the combined aggregate shall conform to Type "B" or "C". Type I of Asphalt Concrete Aggregate Classification, as specified by the City Engineer.

<u>Class "B" and Class "C" Asphalt Concrete Aggregate</u> should be used on a 25%-75% basis respectively. However, these figures are a rough estimate of the past usage. The contract requires the supply of A.C. aggregates in any proportions the City requires.

#### 116.7.3 <u>ASPHALT SUPPLY</u> (Add the following)

The availability of hot-mix and cold-mix asphalt shall be the responsibility of the Contractor. In the event he is unable to supply the asphalt from his own plant he shall provide any and all asphalt requested by the City through purchase from another supplier of the Contractor's choosing. The Contractor shall supply the asphalt at the price bid in this Contract regardless of his cost in procuring it elsewhere.

#### 116.7.4 ASPHALT BATCH PLANT REQUIREMENTS

The contractor (or his supplier) awarded the Annual Street Maintenance Contract shall have the batch plant capability of furnishing a minimum of <u>65 TONS PER</u> <u>HOUR</u> of hot mix asphalt. This quantity is based on the hot mix asphalt requirements the City of Farmington needs to supply the contractor of the hot mix asphalt repaining program.

# ASPHALT REJUVENATING AGENTS

#### 117.1 <u>GENERAL</u>

Add the following:

Type I rejuvenating agent as specified shall normally be used. The City may allow the use of emulsified Cyclogen rejuvenating agent (or equal) if requested in writing and approved by the City Engineer.

#### 117.3 <u>TESTING</u> (Add the following)

If emulsified Cyclogen use is approved, it shall meet the following specifications:

<u>Property</u>	Test Method	Specifications
Pumping Stability	G.B. Method	Pass
Emulsion Coarseness percent	Sieve Test, ASTM D 224- 76(MOD)	0.1 max.
<b>F</b>	- ( - )	2.0 max.
Sensitivity to Fines, Percent	Cement mixing ASTM D 244-76	
,		Positive
Particle Charge	ASTM D 244-76	
Concentration of Oil Phase, percent	ASTM D 244- 76(MOD)	60 min.

#### 117.5.3 <u>MEASUREMENT AND PAYMENT</u> (Add the following)

If Cyclogen or equal is approved, no additional compensation shall be made.

The storage and dispensing facilities of Cyclogen shall be included in other items of work, and no direct payment will be made for storage and dispensing facilities.

# PLASTIC PIPE (WATER & SANITARY SEWER USE)

#### 121.4.2 <u>TRACER WIRE</u> (Delete this section and add the following)

Tracer wire shall be installed with all PVC pipe installations or as directed by the City Engineer. Tracer wire is required on all water line installations. Tracer wire shall be a minimum of 10 gage wire size for all installations and shall be coated wire. All service laterals from the main line to the water meter can shall be installed with a 10 gage coated tracer wire. The tracer wire for the lateral shall be connected to the tracer wire on the main line in a manner approved by the City Engineer. A minimum of a three foot pigtail shall be left in the meter can for tracing purposes.

The installed 10 gage coated tracer wire shall be attached to the top of the pipe with duct tape. The wire connection shall be made by a split bolt, and the wire connection shall be wrapped with electrical tape to protect the connection. The tracer wire shall be electrically connected to surface appurtenances of the water line using jumper wires and cad welding. Surface appurtenances shall include hydrants and blow-offs, etc. The wire must pass a conductivity test performed by the City of Farmington's Operations and Maintenance Utility Contractor prior to acceptance of the utility. In the event that the first test does not pass, all retests shall be performed at the contractor's expense unless the failure was due to the operations and maintenance contractor's equipment and/or operation of that equipment. Copy of said test shall be provided to the City. The cost of tracer wire, installation and testing, excluding retests, including all labor and equipment, as necessary, shall be included in the unit cost for PVC water main. No separate payment shall be made for tracer wire. The Contractor will be required to connect the tracer wire to water service meters at no additional cost.

# All pressure sewer lines (mainlines and service) shall be installed with a tracer wire including yard lines.

# 121.5.1.1 (Delete paragraph and substitute the following)

Polyvinyl chloride (PVC) pipe shall meet the requirements of AWWA C900 for all diameters and shall be Underwriters Laboratories (UL) approved. This pipe shall be furnished in ductile iron pipe equivalent outside diameters. Joints shall be push-on, flexible, elastomeric gasketed and minimum pressure class of 150 psi (DR 18).

#### 121.5.2.1 P.V.C. SEWER SHALL MEET THE FOLLOWING:

PVC Sewer Pipe shall be SDR-35. PVC Sewer pipe for force mains shall be C-900, purple pipe.

# **REINFORCED CONCRETE PIPE**

# 123.1.2 <u>GENERAL</u> (Add the following)

All RCP used in this contract shall be Class III or Class IV, as specified by the City Engineer, and conform to ASTM C 76 with a wall thickness "B", all sizes or as noted on the plans.

# ROADWAY EXCAVATION

#### 202.1 <u>GENERAL</u> (Add the following)

Where roadway excavation is used, the City shall prepare cross section of the proposed work and shall furnish the Contractor with plans showing the finished section. Included in this item is excavation material from City provided borrows within 1320 feet of the project limits and delivering the material to the proper location on site for fill construction.

Different conditions of excavation may be encountered on this project. Due caution shall be exercised by the Contractor in preparing the bid proposal. The Contractor shall provide all necessary cofferdams, pumps, drains, well points and other necessary means for removing water from the excavation or other parts of the work or for preventing the slopes of excavations from sliding or caving, and he shall satisfactorily remove the water, whether it be from ground water or other sources. Dewatering shall continue for a minimum of twenty-four (24) hours in the vicinity of any concrete to allow the concrete to properly set. All water shall be disposed of by pumping into ditches, storm sewers or as may be approved by the City Engineer.

#### 202.9 <u>MEASUREMENTS</u> (Add the following)

Payment shall be based on load counts agreed on by the City and the Contractor on a daily basis. Included in the unit price bid for roadway excavation shall be any clearing and grubbing within the excavated area. This item shall not include rock excavation.

Limits of payment shall be from existing ground profile down to the top of subgrade preparation. Hauling material within the project limits and within 1320 feet of the project limits is incidental to the unit price bid for this item.

# FILL CONSTRUCTION

204.1 <u>GENERAL</u> (Add the following to the first paragraph)

Fill material shall be approved by the City Engineer.

#### **BORROW EXCAVATION**

#### 205.1 <u>GENERAL</u> (Add the following)

The Contractor shall provide a borrow area to assure supply of the quantities of material shown on the bid proposal. The area shall be within 5 miles of the Farmington City limits and shall be approved by the City Engineer.

#### 205.4 <u>MEASUREMENT</u> (Add the following)

Payment shall be based on load counts agreed on between the City of Farmington and the Contractor. Hauling borrowed material to the job site shall be paid separately under Haul.

If the City provides a borrow area within 1320 feet of the contract limits, no payment will be made for borrow excavation. Such excavation from City provided borrows will be paid as Roadway Excavation, with no allowance for haul.

Borrow excavation shall include excavation and providing the borrow material from a Contractor provided site. Payment for stripping unsuitable overburden off the borrow area will not be made and shall be incidental to the actual borrow excavated.

# SELECT FILL MATERIAL

#### 211.1 <u>GENERAL</u>

This work shall consist of obtaining, hauling and delivering 3/4 minus aggregate acceptable to the City Engineer to replace unsuitable material excavated under other items or as special fill. Compaction of the select material to the requirement of Section 204 is also included in this item.

#### 211.2 MEASUREMENT AND PAYMENT

Payment for this item shall be by ton by weight ticket. The unit price bid shall include all labor to compact and finish the select fill material to the proposed cross section and grade.

# <u>HAUL</u>

#### 212.1 <u>GENERAL</u>

Haul shall consist of transporting material obtained from Contractor provided borrow area distance in excess of the free haul distance of 1320 feet from the project limits. Free haul distance within the job site and up to 1320 feet beyond the project limits shall be hauled with no additional compensation and shall be merged into the unit price bid for other items.

#### 212.2 MEASUREMENT AND PAYMENT

Haul Distance shall be measured by the City accompanied by the Contractor to the nearest tenth mile. The Haul Distance shall be measured along the shortest route determined by the City Engineer to be satisfactory and feasible. Should the Contractor elect to follow a route other than the one determined by the Engineer, no additional compensation will be made.

Haul shall be paid based on the bank yards of material determined under borrow excavation times the distance to the project limits determined above. The unit shall therefore be yard mile.

#### SUBGRADE PREPARATION

#### 301 DESCRIPTION

This work shall consist of compacting and finishing the subgrade in compliance with the specifications and the lines, grades, and typical cross-sections shown on the plans or established by the City Engineer or his designee.

#### **301.4** <u>CONSTRUCTION REQUIREMENTS</u>

The top 6 inches of the subgrade shall be compacted to not less than 95% percent of modified proctor, except high volume change soils shall be compacted to 90% of modified proctor. For the purpose of these specifications, a high volume change soil is defined as any soil containing 35 percent or more of material passing No. 200 sieve. The moisture content of the top 6 inches of the roadbed shall be in accordance with the following provisions.

Unless otherwise provided, roadbed embankment of earth material shall be constructed with moisture and density control. Construction of non-roadbed embankments of earth material will not require moisture and density control, unless so specified on the plans. Unless otherwise shown on the plans or in the special provisions, the moisture content of the soil at the time of compaction shall not exceed the optimum or be less than the optimum, minus 5 percentage points, as determined by AASHTO T-180, except that in high volume change soils the City Engineer or his designee may require a moisture content more in excess of optimum. No payment will be made for re-handling or manipulating material.

Densities will be determined in compliance with AASHTO T 180. Field densities tests will be taken at locations designated by the City Engineer or his designee and the densities will be determined in compliance with AASHTO T 205, use of nuclear methods in conformity with AASHTO T 238 and 239, or other approved methods.

The top surface of the finished subgrade shall not vary more than 0.1 foot above or below established grade and 0.05 foot above or below the typical cross-section measured on the finished surface at right angles to the centerline. All deviations from these tolerances shall be corrected at contractor expense. Roadbed construction under a previous contract shall be bladed, shaped, and compacted in accordance with the construction requirements of subgrade preparation.

Construction of roadbed embankments predominately of rock material (65 percent plus No. 4 sieve) will not require moisture and density control, except that the top 6 inches of the embankment shall be constructed in accordance with the requirements of subgrade preparation above.

#### **301.7** <u>METHOD OF MEASUREMENT</u>

Measurement will be made as follows: Subgrade preparation will be measured by the square yard on the top surface of the finished subgrade.

# 301.7.3 BASIS OF PAYMENT

The accepted quantities of subgrade preparation will be paid for at the contract unit price per square yard of finished subgrade.

NO PAYMENT WILL BE MADE FOR RE-HANDLING OR REWORKING MATERIAL TO MEET MOISTURE AND DENSITY REQUIREMENTS

# **BASE COURSE**

#### 302.3.1.1 <u>MATERIALS</u>

Base Course aggregate shall be Class II.

302.6 <u>METHOD OF MEASUREMENT</u> (Add the following)

Base course in place shall include all labor, equipment and materials necessary to place and compact base course according to these specifications for use as a surface treatment I.E. gravel driveway, shoulder, backfilling of trenches, etc. This item will NOT be paid in conjunction with any other surfacing item, since those items include the cost of their base course in the unit price.

# **BITUMINOUS STABILIZED BASE**

# 306.3.2 <u>AGGREGATE</u>

Aggregate gradation shall be Class II, as specified in Section 302.3.2, of the New Mexico Standard specifications for Public Works Construction, 1987, or latest revision.

# ASPHALT CONCRETE PAVEMENT

#### 336.4.5 TACK COAT PAYMENT (Add the following)

When called for in the specifications and on the plans for patch work, the application of a tack coat shall be considered as an incidental item and no separate measurement or payment will be made.

#### 336.**11.2** PAYMENT

All work and materials noted in this section will be incidental to the Surface Course Replacement Asphalt bid item or as noted above. Any rework or replacement of materials that do not meet these section requirements shall be at the contractor's expense.

#### 336.12 ASPHALT SURFACE COURSE REPLACEMENT

#### <u>GENERAL</u> (Add the following)

Asphalt surface course replacement shall include all labor, equipment and materials necessary to properly cut existing pavement, remove, dispose and replace an existing asphalt surface course with a thickness of asphalt equal to or exceeding the existing asphalt depth. In no case shall the asphalt replaced be less than 3 inches thick. Included in the unit price bid shall be a 10 inch depth of base course material, tacking edges and all associated compaction.

A lay down paving machine will be used in paving all trenches over 100 feet in length **and a minimum of 8 feet in width.** 

Wintertime surface course replacement shall include all labor, equipment and materials necessary to properly cut existing pavement, remove, dispose and replace an existing asphalt surface course with 3" of cold mix asphalt. Included shall be a 10 inch depth of base course material and all associated compaction.

Remove cold-mix, replace with hot-mix shall include all labor equipment and materials necessary to remove and dispose of existing cold-mix patch, shape and tack the edges and install a hot-mix asphalt patch to a thickness equal to or exceeding the existing thickness of the surrounding asphalt pavement. In no case shall the asphalt replaced be less than 3 inches thick after compaction.

#### 336.12.1 WORKMANSHIP

All pavement cuts shall be made with clean, neat vertical edges as noted on the standard drawings. The contractor shall replace the asphalt as noted on the standard drawings and as required by these specifications.

After the contractor has completed the installation of the underground pipe (conduits) or other type excavations and backfilled the trench he will re-trim the edges of the existing asphalt pavement as required to assure a smooth flat surface to patch against. The surface in question is the horizontal plane of the street or riding surface. The distance from the original vertical cut to the new edge will be a minimum of 6-inches and be completed with a saw or pneumatic hammer.

**NOTE:** The surface of the patch shall match the grades of the patch edges on the existing street section and will not have ridges or divots in the patch area or along the edges of the patch. The acceptable amount of deviation is 3/8-inch over a ten foot length. This is to be measured in any direction with a straight edge or string line.

The contractor will tack coat the vertical edges of the cut prior to the installation of any asphalt material. The application method for tack coat is by brush or spray and will be a full coverage of the vertical surface. Dripping or poring of tack material is not acceptable.

WARNING! These requirements are the minimum standards for workmanship and the contractor will be held to these standards.

Variances to this requirement shall be made only by the City Engineer or his designated representative after visual inspection.

# CEMENT CONCRETE CURBS, GUTTERS, SIDEWALKS, DRIVEWAYS AND ALLEY INTERSECTIONS

#### 340.4.6 <u>BLOCK JOINTS</u> (Add the following)

All curb and curb and gutter shall be divided into blocks or stones 5 or 10 feet in length using metal templates not less than 1/16 inch nor more than 1/4 inch thick; templates shall be attached securely to forms to prevent movement while adjacent concrete is being placed and consolidated; location of template definitely marked so that the joint cut into the finished surface shall exactly coincide with the butt joint formed by the template. In areas where curb and gutter is constructed without a sidewalk, grading and compaction shall continue to the right-of-way at which point the elevation shall be 6 inches above the top of curb.

#### 340.5.4 <u>EXPANSION MATERIAL</u> (Add the following)

The cost for expansion material will be included in other items of work. Celotex material will not be used for expansion joints.

#### 340.6.2 <u>SIDEWALK</u> (Add the following)

#### Sidewalks and Drivepads

Except as noted in the requirements below, City Ordinance Chapter 24 shall govern the construction method of sidewalks and drivepads. The subgrade under the sidewalk shall be required to be compacted to 90% density as determined by the Modified Proctor Method, ASTM D-1557. The area from the back of the curb and gutter to the right-of-way shall be graded and the elevation at the right-of-way shall be 0.5 feet above the top of the curb. <u>NOTE: All sidewalks must be backfilled to top of walk.</u>

#### 340.6.3 <u>CURB AND GUTTER</u> (Add the following)

A minimum of 3 inches of compacted base course shall be placed under the curb and gutter and compacted to 90% density as determined by Modified Proctor. Curb and gutter shall be backed with clean fill material, 3/4" minus, and compacted to 90% density as determined by a Modified Proctor. Curb and gutter shall be backfilled a minimum of 2 feet, measured from back of curb, and level with top of curb.

#### 340.8.2 <u>DRIVEWAY ENTRANCES</u> (Add the following sentence to paragraph B)

Driveways shall conform to the City Ordinance Chapter 29 and to the Standard Details attached herein. <u>NOTE:</u> Whenever possible and where practical, utilities shall not be located in residential driveways.

# 340.14 MEASUREMENT AND PAYMENT

A. Sidewalk: The payment for this item shall be based on the unit bid price for sidewalk (four inch thickness), multiplied by the field measured surface area (to the nearest square yard) of this item complete in place, in accordance with the plans and/or specifications. Payment made, based on the unit bid price, shall be full compensation for all permits, inspection fees, all material, labor and equipment and for performing all operations, including grading and compaction, removal and replacement, and incidentals, such as site cleanup and disposal of excess materials and soil, necessary to complete the work.

B. Drivepads and Valley Gutter: The payment for this item shall be based on the unit bid price of drivepad and valley gutter (six inch thickness) complete in place, multiplied by the field measured surface area (to the nearest square yard) of this item complete in place in accordance with the plans and/or specification. <u>All concrete for Valley Gutters will achieve a minimum compressive strength of 3000 psi in 24 hours.</u> Payment made, based on the unit bid price, shall be full compensation for all permits, inspection fees, all materials, labor and equipment, and for performing all operations, including grading and compaction, and soil necessary to complete the work. Asphalt removal and disposal for Valley Gutters will be paid for separately.

C. Two foot standard and median curb and gutter: The payment for this item shall include removal, disposal and replacement of existing curb and gutter and shall be paid to include adjusting and compacting the subgrade. The removal of asphalt and the replacement of 3" asphalt and ten (10) inches of base course shall be performed in accordance with section 336.12 ASPHALT SURFACE COURSE REPLACEMENT. Payment for replacement of asphalt in excess of 20" from the curb line will not be allowed without prior approval of the city engineer or his designee.

D. Wheel chair ramps and four (4) inch residential drivepads: Payment for these items shall be included in the unit price bid for concrete sidewalk.

E. For new or relocated curb & gutter, sidewalk, slope paving or valley gutter (colored or stamped) subgrade preparation will be paid under Subgrade Preparation Bid Item.

# REMOVAL AND DISPOSAL OF EXISTING PAVEMENT, CURB AND GUTTER, SIDEWALK, DRIVEPADS AND SLOPE PAVEMENT

#### 343.4 (Add the following) DISPOSAL:

Haul: Haul to disposal sites shall be considered part of removal and disposal, no separate payment will be made for haul. Disposal sites will be within 7 miles radius of the project site. Disposal beyond a 7 mile radius will constitute a change order and a method of payment will be negotiated.

#### 343.5 <u>MEASUREMENT AND PAYMENT</u> <u>Item for Asphalt Removal and Disposal, 7-mile haul, is to be paid only where</u> <u>asphalt is removed and not replaced or when use of a laydown machine is</u> <u>required.</u> Note that all other items that deal with asphalt have removal already included in their unit prices. Item for Asphalt Removal and Disposal, 7-mile haul is

not to be used in conjunction with those items.

# FENCE

#### 410.3.3.1.3 (Add the following)

TOP RAILS shall be in lengths not less than 18 feet and shall be fitted with couplings to connect the lengths into a continuous run. The couplings shall not be less than 6 inches long, with a .070 minimum wall thickness, and shall allow for expansion and contraction of the rail. Open seam outside sleeves shall be permitted only with a minimum wall thickness of 0.100 inches. Suitable ties or clips shall be provided in sufficient number for attaching the fabric securely to the top rail at intervals not exceeding 2 feet. Means shall be provided for attaching the top rail to each gate, corner, pull and end post. Tension wire is required at the bottom of the fence.

#### 410.3.3.2 (Delete this section and add the following)

FITTINGS shall also comply with ASTM F626 as well as the following: POST BRACES shall be provided for each gate corner, pull and end posts shall consist of a round tubular brace extending to each adjacent line post at approximately mid-height of the fabric, and a truss consisting of a rod not less than 5/16 inch nominal diameter from the line post back to the gate, corner, pull or end post, with a turnbuckle or other equivalent provision for adjustment. Truss rods may be eliminated in any line of fence where there is a continuous center rail.

POST TOPS shall consist of ornamental tops or combination tops with barbed wire supporting arms, as specified. The top shall be provided with a hole suitable for the through passage of the top rail. The post tops shall fit over the outside of the posts and shall exclude moisture from the post.

BARBED WIRE SUPPORTING ARMS shall be at an angle of approximately 45 degrees or vertical as specified, and shall be fitted with clips or other means for attaching three stands of barbed wire. With 45 degree arms the top wire shall be approximately twelve inches horizontally from the fence line and the other wires spaced uniformly between the top of the fence fabric and the outside strand. Barbed wire arm shall be of sufficient strength to withstand a weight of 250 pounds applied at the outer strand of barbed wire.

TENSION BARS shall not be greater than 3/4" or less than 3/16" in diameter and not less than two (2) inches shorter than the nominal height of the fabric within which they are to be used. One tension bar shall be provided for at each end and gatepost, and two for each corner and pull post.

TENSION WIRE shall be Marcelled (spiraled or crimped) #7 gauge (0.188 in.) plus or minus 0.005 inches in diameter. Wire shall be metallic coated. Zinc coated tension wire shall be Class III (0.08 oz. of zinc per square foot of uncoated wire surface). Aluminum coated tension wire shall have 0.40 oz. of aluminum per square foot of uncoated wire surface.

#### 410.3.3.3 (Add the following)

TIE OR CLIPS shall be provided in sufficient number for attaching the fabric to all at intervals not exceeding 15 inches; and not exceeding 24 inches when attaching fabric to top rail or tension wire.

BANDS OR CLIPS of adequate strength shall be provided in sufficient number for attaching the fabric and stretcher bars to all internal posts at intervals not exceeding 15 inches. Tension bands shall be formed from flat or beveled steel and shall have a minimum thickness after galvanizing of 0.078 inch; and a minimum width of 3/4 inch for posts four (4) inches O.D. or less; and 0.0108 inch thickness by 7/8 inch for posts larger than four (4) inches O.D.

BRACE BANDS shall be formed from flat or beveled steel and shall have a minimum thickness of 0.108 inch after galvanizing; and a minimum width of 3/4 inch for post thickness and 0.010 inch on width shall apply-attachment bolts shall be 5/16 dia. x 1- $\frac{1}{4}$  galvanized carriage bolts and nuts.

#### 410.3.3.6 (Delete the paragraph and add the following)

GATES shall be swing as specified, complete with latches, stops, keepers, and hinges and with provision for three strands of barbed wire above the fabric.

GATE FRAMES shall be constructed of tubular members welded at all corners or assembled with fittings. On steel, welds shall be painted with zinc based paint. Where corner fittings are used, gates shall have truss rods of 4/16 inch minimum nominal diameter to prevent sag or twist. Gate leaves shall have vertical intermediate bracing as required spaced so that no members are more than 8 feet apart. Gate leaves 10 feet or over shall have a horizontal brace or one 5/16 inch minimum diagonal truss rod. When barbed wire top is specified, the end members of the gate frames shall be extended one foot above the top horizontal member to which 3 strands of barbed wire, uniformly spaced, shall be attached by use of bands, clips or hook bolts. Gate frames shall be fabricated from galvanized steel pipe conforming to ASTM A120 and A123.

GATE FABRIC shall be same type as used in fence construction. The fabric shall be attached securely to the gate frame at intervals not exceeding 15 inches.

GATE LATCHES, STOPS AND KEEPERS shall be provided for at all gates. Latches shall have a plunger-bar arranged to engage the center stop. Latches shall be arranged to be set in concrete and to engage a plunger bar from the latch of double gates. No stop is required for single gates. Keepers shall consist of a mechanical devise for securing the free end of the gate when in the full open position.

GATE HINGES shall be of adequate strength for gate, and with large bearing surfaces for clamping in position. The hinges shall not twist or turn under the action of the gate. The gates shall be capable of being opened and closed by one person. 410.3.3.7 (Add the following)

These are minimum weights and diameter. The Contractor may exceed these requirements at this position.

410.3.3.8 (Delete this section and add the following)

At the option of the Contractor, post, rails, braces and gates frames (members) may be manufactured from steel conforming to ASTM F6669-81 (group IC), A446/A4446M-83 (structural grade D), ore A570-84A (grade 50). Coating shall be one of the following:

- A. 0.9 ounces minimum of zinc per square foot.
- B. 15 micrograms minimum of zinc chromate per square inch.
- C. 3 mills minimum cross-linked polyurethane acrylic exterior coating.
- 410.3.3.9 (Change this section to read as follows)
  - a. Change the 8 feet to 6 feet in this Section
  - b. Barbed wire shall conform to 410.3.2.1

#### 410.6 MEASUREMENT AND PAYMENT (Delete this section and add the following)

Payment will be by one of the following methods:

a. Furnish and install: Payment for gates complete with all accessories shall be at the unit price bid in the proposal for each installed. Payment for fencing, complete with all accessories, shall be by the linear foot installed, excluding gates at the unit price in the proposal.

b. Furnish Only: Payment shall be made by lump sum only as outlines on bidding documents.

#### APPROVED MATERIAL 7 MANUFACTURER LIST

- A. Schedule 40
- B. Allied Tube Con, SS-40
- C. Century Tube, CMT-40
- D. P & H Tube Div., SP-40 Pozitube
- E. American Tube Co., Tuff-40

Equal Items: Vendors quoting equal material and/or manufacturers that are not listed above are required to notify Purchasing at 505-599-1369. Product approval is required not less than 48 hours prior to bid opening date. Complete product specifications must be submitted and vendor may be required to supply a product sample at no cost for approval to the City of Farmington.

# WORK AREA TRAFFIC CONTROL AND SAFETY

#### 4**51**.1 <u>GENERAL</u>

The purpose of this document is to set forth the basic principles and standards to be observed by all those who perform work on a public street within the city limits of Farmington to provide safe and effective work areas, to warn, control, protect, and expedite vehicular, bike, and pedestrian traffic.

#### 4**51**.1.1 <u>APPLICABILITY</u>

Unless otherwise stated, the requirements specified in this document are applicable to all contractors, public utilities, and city work crews performing work on or near public streets in all cases where traffic is affected by such work.

#### 4**51**.1.2 <u>GOALS</u>

Proper traffic control techniques shall be effectively utilized to:

- A. Prevent accidents both to the public and work crews.
- B. Prevent damage to private and public property including damage to the construction project and construction equipment.
- C. Minimize the possibility of claims and litigation arising from construction zone accidents.
- D. Reduce confusion to motorists and pedestrians.
- E. Expedite traffic flow.
- F. Improve public relations.
- G. Insure conformity with national and state regulations for traffic control.

# 4**51**.1.3 <u>AUTHORITY</u>

All work in the right-of-way shall conform to the standards and guidelines outlined in the most recent version of <u>Part VI of the Manual on Uniform Traffic Control Devices</u>. The City Engineer or his designee has centralized authority for reviewing and prescribing proper traffic controls and devices at work sites. The contractor/developer is responsible for all construction related traffic control from beginning of the project until final acceptance by the City Engineer.

#### 4**51**.1.4 <u>PLANNING</u>

All persons responsible for supervising work sites must plan well in advance to keep traffic obstruction, public inconveniences and lost work time to a minimum. The planning responsibility requires a visit to the work site to consider:
- A. Traffic conditions.
- B. Existing traffic controls.
- C. Traffic lane requirements.
- D. Physical features.
- E. Visibility restrictions
- F. Problems of access to private property.
- G. Business access and activities.
- H. The type, number, and location of signs, barricades, lights, and other traffic devices required for the work.
- I. Provisions for handicapped persons affected by the worksite.

# 451.2 <u>RESPONSIBILITIES</u>

All persons responsible for work in the roadway must:

- A. Provide timely notification to, and coordination with, all affected agencies including the following:
  - 1. Fire Department
  - 2. Police Department
  - 3. Public Works Department
  - 4. Operational Management International, Inc. (OMI)
  - 5. Farmington Electric Utility Department
  - 6. Telecommunications Utility
  - 7. Cable T.V.
  - 8. PNM
- B. Inform occupants or abutting properties of access limitations made necessary by the work. Twenty-four hour advanced notice is required unless it's emergency work.
- C. Schedule and expedite work to cause the least inconvenience to the public. Construction or repair work will not be permitted at or in the vicinity of signalized intersection between the hours of 7:00 a.m. to 8:00 a.m. and 4:00 p.m. to 5:30 p.m. without advance approval of the City Engineer or his designee.
- D. Install and maintain required traffic control devices.
- E. Provide flagmen when required.
- F. <u>All employees working in or adjacent to a traveled roadway must wear orange</u> or green traffic jackets or vests, or tee shirts.
- G. Provide adequate safeguards for workers and the general public.
- H. <u>Patrol the construction site as required insuring that all devices are in place</u> and operating at all times.
- I. Remove traffic control devices when they are no longer needed.

## 451.4.1 RIGHT-OF-WAY WORK LICENSE

Any firm or individual working within the right-of-way is required to obtain a business license by the City of Farmington.

# 451.5 <u>TEMPORARY TRAFFIC LANES</u>

Effective control of traffic in work areas requires a provision of adequate street space to accommodate traffic demands, particularly during the peak traffic hours.

Temporary traffic lane requirements for construction activities in arterial streets may be specified on the plan, or in the contract specifications. These requirements constitute a part of the work agreement and must be adhered to as rigidly as any other specification. <u>Unless otherwise specified, construction operations are limited to one-half of the roadway at any time.</u>

Maintenance activities in arterial streets shall be planned and scheduled to minimize interference with traffic. Except for emergency situations, no maintenance work shall encroach into a moving lane of traffic between the hours of 7:00 a.m. to 8:00 a.m. or from 4:00 p.m. to 5:30 p.m. unless specifically authorized by the City Engineer or his designee.

All temporary traffic lanes shall be a minimum of 10 feet in width unless otherwise authorized

Suitable surfacing must be provided for the temporary traffic lanes in work areas. When traffic is diverted from the existing pavement, temporary asphalt surfacing shall be provided.

Construction equipment not actively engaged in the work, employee vehicles and official vehicles of the agency shall not be parked in the vicinity of the work in such a manner as to further restrict or obstruct traffic flow. Vehicles and equipment in continuous or frequent use may be operated or parked in the same traffic lane as the work obstruction. Construction spoil or materials may be similarly stored in this area or on the nearby parkway or sidewalk area, provided four feet of sidewalk is kept clear for pedestrian use. To prevent the spoil bank from occupying too great a space at its base, toe boards may be used to keep it two feet from the edge of the excavation on the side and two feet from the edge of the traffic lane on the other.

## 451.6 CONTROL, WARNING AND GUIDANCE DEVICES

All control, warning and guidance devices shall conform to the Manual on Uniform Traffic Control Devices for Streets and Highways as adopted by the New Mexico State Highway Traffic Department.

#### 4**51**.6.1 <u>SIGN TYPES</u>

Traffic signs are classified into several functional groupings:

Warning, Guide and Regulatory.

The use of "Regulatory" signs shall be approved by the City Engineer or his designee. When required, all such signs shall be provided, installed and maintained by the contractor.

Existing "Regulatory" signs within or adjacent to the work area shall be maintained by the contractor. If existing signs are not appropriate for traffic conditions in the work area, the City Traffic Engineering Division shall be notified to determine if signs shall be covered, replaced, or relocated.

#### 4**51**.6.2 <u>SIGN PLACEMENT</u>

The location of the signs will depend upon alignment, grade, location of street intersections and posted speed limit. Signs shall face and be visible to on-coming traffic and be mounted so as to resist movement. The center of signs shall be at least  $4\frac{1}{2}$  feet above the roadway with the bottom of the sign where pedestrian traffic is permitted shall be seven feet. "Advance Warning" signs shall be located on the right hand side of traffic lanes. On divided highways, supplemental advance warning signs shall be placed on the divider.

All signs which are to convey their message during darkness shall be reflectorized or illuminated. No signs or supports shall bear any commercial advertising.

Signs normally shall be installed immediately before work is to commence and must be removed immediately after work is completed. If at any time a sign is not required it shall be covered or removed.

#### 451.6.3 BARRICADES

Barricades serve the following purposes:

- 1. To alert the public to the fact that a particular area is closed to traffic.
- 2. To prevent drivers and pedestrians from entering the area.
- 3. To protect workers.
- 4. To support signs and warning lights.

Barricades shall not be placed in a moving lane of traffic without advance warning, such as a high level warning device and appropriate delineation. A single barricade shall not be placed alone in the traveled way.

When barricades are used to close a street, they shall be placed so there is no gap large enough for a vehicle to pass, except where necessary to provide access for local traffic or emergency vehicles. Markings for barricade rails shall be alternate orange and white stripes sloping downwardly at an angle of 45 degrees in the direction traffic is to pass. The entire area of white and orange shall be effectively reflectorized for nighttime use.

# 4**51**.6.4 <u>DELINEATORS</u>

Traffic cones, vertical panels or barrels are classified as "Delineators" are markers that aid the driver in determining the location and alignment of traffic lane. By day, the effectiveness is determined by position and visibility.

All delineators used at night must have adequate reflectors. Delineators are used:

- 1. To channel and divert traffic in advance of work zone.
- 2. To define the travel way through the work zone.
- 3. To define a change in the position of the existing lanes around the work zone.
- 4. To define curves and the edges of the roadway on detours.

On arterial streets, opposing traffic shall be separated by delineators, traffic striping, or raised pavement markers. Where traffic is diverted to the left of an existing double yellow centerline, into a painted median, or into a left turn lane, delineators shall be utilized beyond the work area to return traffic to normal lanes.

Delineators shall be spaced at 15-foot intervals in the transition areas where traffic is being shifted and at not more than 50-foot intervals at other locations. Delineators shall be of approved material and construction.

A taper of 20:1 is the minimum. If more room is available, the taper shall be increased to the legal speed limit, i.e. 25 mph - 25:1 taper. Tapers shall conform to the standards and guidelines outlined in the most recent version of Part VI of the Manual on Uniform Traffic Control Devices.

# 451.6.5 HIGH LEVEL WARNING DEVICES (FLAG STANDARDS)

High level warning devices provide advance warning of a work area by being visible to a driver even when the work area is obstructed from view by vehicles or construction equipment.

High level warning devices shall be at least 12 feet high with legs, base or truck mounting designed to resist overturning in brisk winds. Sandbags may be used to add weight to the base or legs. High level warning devices shall be equipped with a yoke at the top to accommodate at least three flags. Flags shall be fabricated of high visibility orange material and equipped with stays to keep the flags extended. Torn or dirty flags shall be immediately replaced.

By using the high level warning device, tapers may be shortened by 50 percent except on arterial roadways.

## 4**51**.6.6 WARNING LIGHTS - ILLUMINATION

Flashers shall be used only to outline the work area or to provide advance warning. Flashers shall not be used to channelize traffic, to separate opposing traffic, or to delineate the path that traffic is to follow. Flashing yellow lights used for advance warning must be clearly distinguishable from the primary delineation and shall be seen above the normal reflectorized units.

Warning lights are portable, lens directed, enclosed and mounted at the minimum height of 3 feet to the bottom of the lens. The color of the light emitted shall be yellow. Barricade warning lights shall be in accordance with the requirements of the New Mexico Highway Department of Transportation specifications. Arrow boards will be required on all arterial streets and will be considered incidental to the arterial traffic control bid item.

# 4**51**.7 PAVEMENT STRIPING AND MARKING

Under certain circumstances, the use of pavement striping or pavement markers may be justified to supplement devices used for delineation.

On major construction projects where traffic is diverted for extended periods, pavement striping or markers are required to assure positive delineation and minimize driver confusion.

In addition to major construction projects, re-striping will be considered for minor construction or maintenance activities under the following conditions:

- 1. When traffic is diverted to the left of an existing double yellow centerline for 2 or more consecutive nights.
- 2. When the work area is adjacent to a major signalized intersection and results in a transition within the intersection.
- 3. When the traffic lane is continuously obstructed for more than one week on any street where traffic volumes require two or more lanes in a single direction.
- 4. In other unusual situations where traffic and physical conditions, such as speed or restricted visibility, require special treatment.

The City Engineer or his designee shall determine the need for and extent of striping removal and re-striping. When temporary pavement striping or makers are provided, the existing striping or markers must be removed or covered by the contractor. The installation of temporary striping or pavement markers will be done by the contractor.

## 451.8 BRIDGING OF EXCAVATIONS AND TRENCHES

Whenever necessary, trenches and excavations shall be bridged to permit an unobstructed flow of traffic. The City Engineer or his designee shall determine the need when bridging is to be used and extent of bridging to be used. The Contractor can use bridging at any time he deems it necessary.

1. Bridging must be secured against displacement by using adjustable cleats, angles, bolts, or other devices.

- 2. Bridging shall be installed to operate with minimum noise.
- 3. The trench must be adequately shored, to support the bridging and traffic.
- 4. Steel plates used for bridging must extend one foot beyond the edges of the trench. Temporary paving materials (premix) shall be used to feather the edges of the plates to minimize wheel impact.

WIDTH OF TRENCH	MINIMUM THICKNESS OF STEEL PLATES
1.0 ft.	½ inch
1.5 ft.	¾ inch
2.0 ft.	1 inch
3.0 ft.	1 inch
4.0 ft.	1-¼ inch

# 451.9 FLAGGER CONTROL

Flaggers are required:

- 1. Where workers or equipment block a traffic lane in excess of 15 minutes causing an obstruction to the flow of traffic.
- 2. Where plans or permit allow the use of one lane for two directions of traffic (one flagger is required for each direction of traffic).
- 3. Where the safety of the public and/or workmen determines there is a need.

Flaggers should be stationed far enough from the work to slow down or stop vehicles before they enter the work area.

A sign reading "Flagger" or "Flagmen Ahead" shall be placed as far ahead of the flagger as practicable.

All flaggers shall be AASHTO certified and provided with an orange jacket (or vest) for daytime use and reflectorized belt and suspender harness for use at night. During daylight hours, flaggers shall be equipped with a sign paddle and red flag. At night, flaggers shall use a red light.

# 4**51**.10 <u>ENFORCEMENT</u>

## 451.10.1 POLICY DISTRIBUTING AND COMPLIANCE

A copy of the policy must be present with each work crew and its provisions strictly enforced by the applicable supervisor.

# 451.10.2 NOTIFICATION OF SCHEDULED WORK

The City Engineer or his designee will notify the appropriate departments of the date and location of work.

## 451.10.3 MONITORING AND ENFORCEMENT PROCEDURES

The City Engineer or his designee will establish and maintain a system of monitoring street work sites for compliance with the requirements herein.

They have on-the-spot authority to correct any deviations from prescribed street work site safety and traffic control procedures.

## 451.10.4 <u>SHUT-DOWN AUTHORITY</u>

It is assumed that routine, informal, and amiable agreements will be reached regarding corrective action which job site supervisors are requested to make. However, in the unlikely event that there should be a failure to correct the cited deficiencies, either of the officials listed above, will have authority to issue a written shutdown order to the offending agency or individual until such time as the deficiencies have been fully corrected. In the event that this step is necessary, the official issuing the order will immediately notify the Public Works Director or the City Engineer in person or by telephone and provide a follow-up copy of the shutdown citation.

# 451.11 BASIS OF PAYMENT

Payment shall be per day based on whether the project is on an arterial or collector street. Arrow boards are required on arterial streets and shall be included in the bid item price. The Contractor shall have an AASHTO certified traffic control person handle all project traffic control layouts, which must be approved by the City Traffic Engineering Administrator.

An approved traffic control plan shall be on file prior to the start of construction. The plan shall be fully implemented to receive payment under this bid item. When Work Area Traffic Control and Safety is not established as a pay item, the work will be considered incidental to the completion of the project and no separate payment will be made. When flaggers are an established pay item, they must be AASHTO certified or no separate payment will be made.

# **CONCRETE STRUCTURES**

## 510.3.2 <u>REINFORCEMENT</u> (Add the following)

Shop drawings for all reinforcing steel shall be submitted in quadruplicate to the City Engineer for approval prior to fabrication and placement of any reinforcing steel.

## 510.18 MEASUREMENT AND PAYMENT (Add the following)

The unit price bid for Structural Concrete shall include all labor, equipment and materials necessary to complete the project according to the construction standards indicated with the exception of rebar which will be a separate bid item. Structural Concrete payment shall be based on the number of cubic yards of concrete used as agreed upon by the City of Farmington and the Contractor. Rebar shall be 60,000 psi minimum. The cost of rebar will be included in related items of work and no separate measurement or payment shall be made for rebar.

## METAL RAILING

## 550.5 MEASUREMENT AND PAYMENT

Delete subsections 550.5.1.1,3 and change 550.5.2 to read price per pound.

# 550.6 <u>HAND RAILING</u> (Add the following)

Hand railing shall be 1¼" schedule 40 metal pipe installed with the first rail 24" above finished grade, the top rail 36" above finished grade, posts at 10' on center, and finished with one coat primer and one coat epoxy paint (color) to be determined by the City Engineer or his designee as per City Standard D630.

# 550.6.1 <u>MEASUREMENT AND PAYMENT</u> (Add the following)

The unit price bid for hand railing shall include all labor, equipment and materials necessary to install hand railing as per D630. Payment shall be by linear foot complete in place.

# **ADJUST STRUCTURES**

#### 560.1 <u>GENERAL</u>

560.1.1 This work shall include the adjustment of all pavement structures to proposed grade including manhole frames and covers, valve boxes, storm inlets, etc., as indicated on the plans or as specified in the supplementary specifications.

#### 560.2 MATERIALS

560.2.1 Concrete and structure work shall meet the requirements of 3000 PSI concrete on Section 500-Concrete Structures.

## 560.3 CONSTRUCTION REQUIREMENTS

- 560.3.1 Raising Structures: If the height that the ring and cover is to be raised is less than one course of brick, then 3000 PSI concrete shall be used. Concrete shall attain strength of 3000 PSI at 28 days and shall be cured by use of an approved curing compound. Adjustment of all structures shall be accomplished PRIOR TO LAYING ANY BITUMINOUS SURFACE for a new street, for an existing street that the asphalt is CUTLERED the adjustment may be accomplished afterwards. If the ring and cover is to be raised 12 inches or more above the top of the existing cone, the cone shall be removed, the adjustment made in the barrel and cone rebuilt or replaced. Adjustment from 4 inches to 12 inches will be made by blocking with from one (1) to three (3) courses of standard means of a poured concrete ridge. Smaller adjustments may be made with a Portland Cement Mortar "Cap". After raising of structures, damaged ½ inch mortar on existing construction shall be retouched to repair damaged areas and to match existing mortared surfaces.
- 560.3.2 Lowering Structures: If a structure is to be lowered other than a slight adjustment, the cone shall be removed, the adjustment taken up in the barrel, and the cone rebuilt. A 3/4 inch minimum Portland Cement Mortar (plaster) surface shall be applied on the inside of the rebuilt surfaces where damaged. If a slight adjustment is to be made, a lowering of as much as the two brick courses may be made, without disturbing the cone.
- 560.3.3 Adjusting Valve Boxes and Covers: Valve box covers shall be made by extending the existing box sections to the proposed grade for paving prior to laying any new bituminous surface course for a new street, for an existing street that the asphalt is CUTLERED the adjustment may be accomplished afterwards.
- 560.3.4 Pavement Finish Treatment

After adjustment, each structure shall be backfilled and compacted according to specifications. A concrete collar 6 inches thick shall then be poured around the structure. The collar shall be constructed as shown on the City of Farmington Construction Standards for detail D-311/D-312 Structure Adjustment. When the concrete is cured a surface course of hot-mix asphalt shall then be applied to bring the pavement to the rim of the adjusted structure. Structures shall not deviate more than 3/8 inches in 10 foot from existing pavement.

## 560.4 MEASUREMENT

Each structure adjusted shall be paid for at the unit price stated in the proposal. The price shall include all labor, equipment, and materials necessary to completely adjust each structure, including but not limited to brick, mortar, concrete, grade rings, welding, steel, tack coat and hot-mix. The bid shall be based on a valve box adjustment to include an asphalt area of  $2' \times 2'$ , the manhole adjustment shall include an asphalt area of  $5' \times 5'$ , the asphalt replaced shall be a minimum of 3 inches thick.

Removal of asphalt from manhole covers and valve boxes less than 3/4" will be paid for on 8:1 basis.

The unit price bid for replacing valve boxes or manhole frame and cover shall include all labor, equipment and materials necessary to remove an existing valve box or structure frame and cover. All work shall conform with City of Farmington Standard No. D-311. Replace valve boxes or manhole frame cover shall <u>not</u> be paid in conjunction with other adjust structures items.

To adjust valve box to grade, adjust manhole to grade, and adjust irrigation or storm sewer frame and cover to grade shall include the cost of installing a new valve box or casting on the adjusted structure. Adjust valve box to grade, adjust manhole to grade, and adjust irrigation or storm sewer frame and cover to grade shall not be paid in conjunction with replaced valve boxes or manhole frame and cover.

The unit price bid for furnish and install new meter cans shall include all labor, equipment and materials to remove and dispose of the old cans and install new meter cans. Furnish and install new meter cans shall not be paid in conjunction with other replace structure items.

# PORTLAND CEMENT FLY ASH CONCRETE FOR CHANNEL LINING AND DIKE OR DAM SURFACING

# 602.12 MEASUREMENT AND PAYMENT

602.12.2 Change the unit of payment from square yards per thickness of concrete to cubic yards of concrete.

# <u>RIPRAP</u>

603.3.3 <u>DESCRIPTION</u> (Add the following)

The sizes of rock to be used in the different thicknesses of riprap are as follows:

# **Riprap Protection**

Thickness	18 inches	12 inches
Max. Size of Rock	1/8 yd ₃	1 ft ₃
Min. Size of Rock	1/10 ft ₃	1½ inches

# 603.11 MEASUREMENT AND PAYMENT

#### 603.11.1 (Delete existing section and add the following)

Measurement for payment of riprap will be made to the outlines of the riprap directed to be placed on the basis of the nominal thickness prescribed. Payment for riprap will be made at the applicable unit price per ton or alternate cubic yard bid in the schedule, which shall include the cost of furnishing, hauling and placing and/or raking the rock for riprap including the rock spalls and gravel to fill the voids in the riprap.

Excavation required for the placing of riprap be measured to the prescribed outlines and depths and will be paid for under applicable unit price per cubic yard bid in the schedule.

603.11.2 Filter cloth shall be measured by square yard in place.

# TRENCH EXCAVATION AND BACKFILL

# 701.6.5.1 BRACING EXCAVATIONS (Add the following)

Failure to properly brace trenches shall be at the risk of the Contractor, and where such failure results in slide or caving, producing unusual or excessive loading on the pipe, the Contractor shall be required to remove and replace the pipe with whatever type of construction the Engineer may require, with no extra allowance for materials or labor. The Contractor shall be responsible for damage to other utilities, buildings, and structures resulting from earth slides, caving or other failure. No extra payment will be made for sheeting, bracing or "boot-caisson". No sheeting or bracing, where used, shall be removed until sufficient backfill is in place to protect the pipe and the adjacent street, alley or easement surface and structure from damage by sliding and caving in of trench sides. No extra compensation shall be allowed for the handling of excavated materials in alleys, easements, streets, or other confined areas.

## 701.6 <u>PUBLIC UTILITIES</u> (Add this Section in its entirety)

Public Utilities: The Contractor shall be responsible for the destruction of, or damage to, all existing structures, pipe lines, conduits, cables, sewers, drains or other properties encountered in conduits, cables, sewers, drains or other properties encountered in or adjacent to the excavation, and he shall use all reasonable measures and precautions to protect such properties, and shall maintain or replace them in as good condition as they were prior to the construction operations. He shall make a diligent effort to locate all underground properties in advance of excavation work, and support or protect them so that they will not be broken and their functions interrupted. The Contractor shall notify all Owners of public utilities that may be affected by construction demands so that the Owner may protect, transfer, change, rebuild, or remove any part of their utilities as the owner may deem fit. Such notification shall be in writing and in advance of work at least one week.

Where abandoned pipes, or sewers are removed from the trench, leaving dead ends in the ground, such dead ends shall be carefully and permanently plugged in a manner approved by the city engineer or his designee.

# 701.7 <u>DEWATERING</u> (Add the following)

All water shall be disposed of by pumping into city approved disposal areas. Only sewage effluent shall be disposed into the sanitary sewer system, all other shall be disposed of per EPA Regulations.

## 701.8.8 <u>OBSTRUCTION</u> (Add the following)

Removal and disposal of obstruction and underground footings and foundations will not be paid for directly, but shall be considered incidental to the contract.

## 701.8.9 (Add the following)

If soil and/or existing pavement conditions encountered in trenching will not allow the area of pavement removal and replacement to be contained within the limits indicated on City of Farmington Construction Standard D-112, the Contractor may request approval of additional width in writing. The Engineer will then approve or deny the request in writing.

Paving cuts shall be repaved to the general thickness and material design provided on the plans and shall be made in complete compliance with the applicable specifications in this contract.

The Contractor shall repave all paving cuts. All unauthorized paving cut areas exceeding the tabulated pay limits shall be repaved at the expense of the Contractor. All other pavement replacements made by the Contractor shall be based on the applicable unit prices.

Pavement cuts shall not be repaved until the newly installed, repaired or replaced City utilities have been pressure tested and no leaks appear unless approved by the City Engineer. The street surface and gutters and other areas shall be swept clean by the Contractor after the pavement replacement is completed.

701.10.1 <u>WIDTH OF TRENCHES</u> (Delete the section and add the following)

Trench widths at the level of the top of the pipe shall not exceed the following and shall be kept to the practical minimum required for properly laying, aligning, grading, and joining of the pipe. Trench widths at the level of the top of the pipe shall not exceed City of Farmington Standard No. D-112. Sloped sides of trenches shall be in at a point not less than 12 inches above the top of pipe. The Contractor shall maintain all trenches in a safe condition protecting the men working and the general public as outlined under Standard Details.

701.11.4 <u>BLASTING</u> (Add the following)

The Contractor shall obtain a Permit for the use of High Explosives from the <u>FIRE</u> <u>MARSHALL AND CITY ENGINEER</u> prior to using such methods of construction.

# 701.14 (Add the following)

When excavated material, in the opinion of the City Engineer or his designee, is unsatisfactory for backfill it shall be removed from the site and disposed of by the Contractor. Base course shall be used by the Contractor for bedding and backfill and paid at the unit price indicated on the bid proposal. Crusher fines shall not be used for pipe bedding material or backfill. All trench backfill material shall be placed and compacted, to 95% of modified proctor, in lifts not to exceed 12 inches.

# 701.15 <u>COMPACTION METHODS</u>

# 701.15.1 (Add the following)

A. Sufficient density tests shall be made at various depths which will give the degree of compaction within the lower one-half of trench backfill and in the initial fill around the pipe, as well as in the upper one-half of the backfill.

Density tests shall be taken as follows:

# <u>A minimum of one field density test shall be made for each 500 feet of trench for each two feet of depth of the trench.</u>

The Engineer shall have the right to call for any additional tests he may deem necessary at shorter intervals along the trench in order to carry out the intent of these specifications.

When tests fail, additional compaction shall be required. If tests indicate the compaction method does not produce the required end results, the Contractor shall alter the methods of compaction in order to obtain the required densities. <u>All recompacted trenches shall be re-tested at the Contractor's expense</u>. All sewer appurtenant structures shall be backfilled in accordance with these requirements.

- B. When trenching within New Mexico State Highway Department right-of-way, the method of compaction and densities required in backfilling of trenches shall comply with the requirements of the New Mexico Highway Department's "Standard Specification for Highway and Bridge Construction", Latest Edition, and all provisions shall be subject to supervision of the States Project Engineer. Final City acceptance of the completed trench backfill will be dependent upon the State. No extra compensation shall be allowed the Contractor for the above trench compaction and testing.
- 701.15.3 (Delete this section and add the following)

Water flooding will not normally be allowed under this contract. When soils encountered exhibit characteristics conducive to water flooding, the Contractor may request permission from the Engineer to use this technique. When such a procedure is approved, the Contractor may jet or flood the trench with water in successive lifts in a volume sufficient to obtain the required density and compaction. Density requirements shall remain the same.

701.15.4 (Add the following)

Proper and adequate backfilling and compaction, regardless of the method used, shall be the responsibility of the Contractor. Final acceptance of the project does not relieve the Contractor of this responsibility. The Contractor shall at his expense repair all damages to streets, sidewalks, curbs, gutter paving, sewer pipe, water lines and any other private or public utility line including damage to abutting private property caused by trench or excavation settlement for a period of one (1) year after final acceptance of the project.

# 701.17 Measurement & Payment

- 701.17.1 (Delete this paragraph and sub-paragraphs entirely and substitute the following)
  - A. <u>Trenching and Backfilling</u>: Trenching and backfilling shall be measured along the alignment of the pipe parallel to the invert of the utility line for which the trenching is performed. Measurement shall be to the nearest lineal foot. Measurement shall be made from center of manhole for all sewer lines. Payment for trenching and backfilling according to specifications for all items other than sanitary sewer is included in the unit prices bid for each item and no separate payment will be made.

Depth of trench shall be measured to the nearest foot vertically from the invert of the utility line to the surface of the existing ground for trenches not within areas to be graded under the same contract and for all graded areas where the finished subgrade elevation is higher than the existing ground. Measurement shall be from the invert of the utility line to the finished subgrade elevation for trenches within graded areas where the existing ground is higher than the finished subgrade elevation. Existing ground shall mean the surface elevations prior to any grading operations.

Payment will be made at the applicable contract unit price per linear foot of pipe at the depth indicated which price and payment shall be full compensation for all excavation, bracing, and sheeting, and for furnishing all labor, equipment, and incidentals necessary to complete all work specified herein.

Trench and backfill unit priced items are for installation of pipe diameters up to 18 inches I.D. for pipe I.D.'s over 18 inches and up to 27 inches payment for trenching and backfill shall be made at 1.5 (one and one-half) times the unit price bid for that depth. For pipe I.D.'s 30 inches or over, payment for trenching and backfill shall be made at 2 (two) times the unit price bid for that depth.

- B. Pavement Replacement: Measurement for pavement replacement shall be made to the nearest square yard on the top of the pavement removed, EXCEPT that the maximum width of pavement removal to be paid for shall not exceed the widths of trench tabulated in City of Farmington Construction Standards. No pavement removed beyond the limits specified or without the approval of the Engineer shall be measured or paid for. Payment will be made at the contract unit price per square yard for pavement replacement which price and payment shall be full compensation for removing and disposing of existing pavement, and construction of replacement pavement and furnishing all labor, equipment, materials, and incidentals necessary to complete the work as specified herein.
- C. 3/4" to one (1) inch trench stabilization aggregate and select backfill or bedding material shall be paid by the ton compacted in place as directed by the City. Payment shall be limited to the maximum trench width indicated in City Standard No. 112 multiplied times the depth authorized by the Engineer.
- D. The unit price for concrete Pipe collar installed on the size of pipe indicated shall include all labor equipment and materials necessary to install a Portland

cement pipe collar around the pipe indicated. The collar shall be a minimum of two (2) feet long along the pipe length and shall extend out from the pipe a minimum of 1 foot in all directions.

E. Item for Rock Excavation will be paid according to the trench widths on City Standard D-112. The hydraulic items are only to be used for special hydraulic attachments used for breaking through rock and shall be measured in the field for actual yardage.

# BORING, DRILLING AND JACKING

# 710.5.3 INSTALLATION

Carrier pipe shall be skidded through the casing on redwood steel tied skids.

Other methods shall be approved in writing by the City Engineer.

## 710.7 <u>MEASUREMENT</u> (Add the following)

Steel casing, bored and jacked shall also include installation of the carrier pipe in the casing.

(Change Payment to read)

Payment shall be based on the unit price bid in the schedule times the diameter in inches of the casing per lineal foot of casing installed. This item will only be used for casings ten inches in diameter or larger.

#### **INSTALLATION OF WATER TRANSMISSION AND DISTRIBUTION LINES**

#### 801.1 (Add the following)

Only the City's Operation and Maintenance contractor shall supervise or perform any connection to existing waterlines or operate any valves. In cases of emergency, or in situations that may endanger the public health, such as water main breaks, the contractor may close nearby valves to minimize danger after coordinating with the City's O & M Contractor at 327-7701 (24 hrs).

801.3.3.2 <u>GATE VALVES</u> Delete this section and insert the following:

Gate valves shall be designed for 150psi operating pressure and shall be Mueller Resilient Seat Type A-2370-20 or approval equal. Gate valves shall be supplied complete with valve box and cover. Valve boxes for ten (10) inches and smaller gate valves shall be two-piece screw type. Clow Model F-2493 stay-put cover or city approved equal.

Gate valves shall be used on pipes 10" in diameter or smaller.

Substitute the following list of approved manufactures:

1) Clow 2) Mueller 3) Kennedy 4) Dresser

## 801.3.4.2 BUTTERFLY VALVES

Butterfly valves shall be used on pipes 12" in diameter or larger.

Delete this paragraph and insert the following:

Butterfly valves shall be an approved equal to those made by the following approved companies:

1) Mueller3) Dresser5) Keystone2) Clow4) Kennedy6) Pratt

The valve bodies shall be coated with a 100% solid heat-cured epoxy coating holiday-free in the waterway. Valve vanes shall be 100% holiday-free.

801.3.6.1 Corporation Stops (Valves) shall conform to AWWA Standard C800-66, outlet to be AWWA C-800 copper service thread, with flare nut. Inlet is to be male IPT. All exposed casting to be bronze ASTM B-62.

All valves to be individually factory tested in both the open and closed position. Corporation stops shall be: Mueller H 15025, Ford F700, Hayes 5204 and Jones J 1505 or an approved equal.

Curb Stops shall be bronze, inlet for flared copper, outlet for female IPT. Curb stops shall be to: Ford Z 21-333 3/4", Ford Z 21-444 1", Mueller H 15275, Hayes 5050, Jones J- 1507 or McDonald 4721 or an approved equal.

Copper setters shall be: Ford VHH72-15 5/8" x 3/4" or 1" VHH74-15, or Mueller H 1404-2A. Non-Bronze Service Saddles shall be nylon coated ductile iron with double stainless steel straps or an approved equal. Nylon to be fusion bonded to an average of 12 mils thickness. The straps, nuts and washers will be type 304 - stainless steel. Gasket will be a rubber type compound to resist oil, natural gas, acids, and alkalis and be water tight. Tap threads to be iron pipe. Saddles will be various sizes for cast iron, asbestos-cement, and plastic pipe. Tap sizes will be 3/4, 1,  $1\frac{1}{2}$ , and 2 inch N.P.T. Non-Bronze Service Saddles shall be: Rockwell 317 or Romac 202-n or an approved equal.

Tapping saddles 4 inches and above shall be two piece, stainless steel capable of fitting A.C., Ductile Iron or PVC pipe.

# 801.3.7 FIRE HYDRANTS (Delete this paragraph and add the following.)

Fire hydrants shall be manufactured by the following approved companies: 1) Mueller (Centurion), 2) Kennedy (Guardian), 3) M & H (Model T-129, Traffic Model), **4) Clow ( Medallion Series ).** 

All hydrants shall meet the following specifications:

Fire hydrants shall be of the dry barrel, compression type, closing with the line pressure. All private fire lines, including private fire hydrants and all appurtenances associated with that private line, shall be tested to a minimum pressure of 200 psi for at least two (2) hours and shall comply with AWWA Standard C-502-94 or latest revision thereof.

Fire hydrants shall open left (counter clockwise) with a 11/2" all bronze pentagon operating nut and an anti-friction washer above the trust collar to reduce opening torque. The hydrant bonnet shall have a lubricant reservoir surrounding the working parts of the hydrant which is "0" ring sealed from the water pressure and weather conditions and a weather shield for freeze protection if available.

Fire hydrants shall have two 21/2" hose nozzles and one 41/2" pumper nozzle with National Standard Hose Nozzle Threads. The hose nozzles shall be cast of minimum Grade D low zinc bronze and shall be threaded and locked into the upper barrel.

## DOUBLE STEAMER HYDRANT

Any hydrant installed on a main line 12" and larger shall have two (2) 4.5" ports and zero (0) 2.5" ports. The underground supply to the hydrant, including all valves shall be 8".

The hydrant traffic feature shall consist of a breakable flange and a breakable ferrous metal "safety sleeve" stem coupling with stainless steel stem coupling pins.

The bronze seat right shall be a minimum 51/2" inside diameter and shall thread into a bronze drain ring or busing forming an all bronze drain way with positive dealing resilient seat drain valve facings. All bronze shall be less the 16% zinc alloy with minimum yield of 20,000 psi as noted in Section 2.1, Table 1 of the above referenced standard. The main valve shall be replaceable with a lightweight wrench by disassembly at the hydrant bonnet flange.

Fire hydrants shall be four (4), five (5) or six (6) feet bury (unless otherwise noted) and shall have a completely assembled six (6) inch mechanical joint shoe inlet. Underground flanging of these parts shall have a minimum of six 3/4" rust-prohibitive bolts or the bolts shall be stainless steel.

All fire hydrant joints not flanged shall require mega lugs or approved equal.

Fire hydrants shall be painted above the ground line with one coat of rust prohibitive primer and one coat of yellow brushing enamel and all other exposed surfaces shall be coated with asphalt varnish as noted in Section 4.2 of the above standard.

In no case shall the Contractor use pipe wrenches to operate fire hydrants.

# **INSPECTION**

All hydrants shall also be inspected by the Farmington Fire Department Fire Marshals office. The inspection shall include a flush and drain test.

801.6.1 <u>GENERAL</u> (Delete paragraph in its entirety and add the following)

Only the City's Operation and Maintenance contractor shall supervise or perform any connection to existing waterlines or operate any valves. In cases of emergency, or in situations that may endanger the public health, such as water main breaks, the contractor may close nearby valves to minimize danger after coordinating with the City's O & M Contractor at 327-7701 (24 hrs).

Tracer wire is to be used on all water line installations as per the Tracer Wire requirements under Section 121.

801.16.1 <u>All new public waterlines, including new fire hydrants that will be incorporated into</u> the City system, shall be tested to 150 psi for two hours.

801.17.2 DISINFECTION SHALL CONFORM TO CURRENT AWWA STANDARDS C-601-81. Tablets shall not be used for disinfection.

Amount of Chlorine Compound (HTH 65%) required for sterilizing various sizes of waterline.

<u>Pipe Sizes</u>	<u>Lbs. Per 100 LF</u>
4"	0.082
6"	0.190
8"	0.336
10"	0.526
12"	0.754
16"	1.54
20"	2.10
24"	3.02
30"	4.72

#### 801.22 MEASUREMENT AND PAYMENT (Add the following)

All items incidental to water line construction shall be included in the per linear foot cost of the waterline, no separate payment will be made for the following:

1) Testing equipment - pump, fittings, special piping, gauges, etc.	4) Blocking and supports.
2) Disinfecting and testing.	5) Tracer wire (section121)
3) Flushing	6) Other incidental items

#### 801.22.4.1 <u>IRON FITTINGS</u> (Delete this section and add the following)

Iron fittings shall be measured by the weight of the fittings installed based on the manufacturer's body casting catalog weight without accessories. Fittings installed shall include all necessary accessories to complete the work incidental to the unit price bid for iron. Fittings include, but are not limited to all tees, crosses, bends, reducers, plugs, offsets, wyes, elbows and any other fittings, standard or reducing types, necessary to complete the work that is not covered by other bid items.

Fittings not used on the contract will remain the property of the Contractor. No payment shall be made to the Contractor for unused fittings.

#### 801.22.10 (Add the following)

<u>Adjust fire hydrant (one foot increments)</u> shall include all labor, equipment and materials, necessary to adjust a fire hydrant up to a one foot increment. All materials including barrel and stem extensions are included in this item.

<u>Remove and relocate hydrant</u> shall include all labor, equipment and materials including excavation to remove and relocate an existing fire hydrant to a new line.

#### 801.22.12 (Delete this section in its entirety and add the following)

<u>All wet taps, cut-ins, physical separations and connections shall be made by and/or certified by the City of Farmington's Operations and Maintenance Utility Contractor.</u> All connections shall require that the contractor supply all materials, labor and equipment necessary to connect to an existing waterline. All new connections shall include all labor, equipment and materials necessary to remove existing joint restraint, thrust block and plug from a stubbed-out water main and connecting a new water main to the stub-out. * Payment of tap saddle used will be made according to the size of pipe being tapped. *

801.22.15 (Delete this section in its entirety and add the following)

AIR RELEASE VALVE: The unit price bid for air relief valve assembly (including vault) of the size indicated according to the City of Farmington Construction Standard D-208 and D-209 specified shall include all labor, equipment and materials necessary to properly install the air relief valve assembly according to the appropriate standard, compete in place, ready for use.

## **INSTALLATION OF WATER SERVICE LINES**

The contractor shall furnish and install all labor, equipment, and materials necessary to properly complete the water service according to City Standard D220 - D223 exclusive of the water meter. All water services shall be installed with all new connecting valves open, tracer wire, pressure tested, including disinfection, as part of any new water line installations.
For water line replacement, the main shall be tested and accepted prior to switching water services.
All hot taps and cut-ins shall be performed in accordance with Section 801.22.12.

# 802.6 WATER METER LOCATION

Water meter shall not be installed within sidewalk or driveway areas. Exceptions must be approved prior to installation by water/ wastewater administrator or his/her designee. In areas where a water meter already exists, either the existing water meter or the proposed driveway or sidewalk shall be relocated not to impede with one another at the owner's expense.

## 802.8.4 <u>MEASUREMENT AND PAYMENT</u> (Add the following)

The unit price bid for installation of water service lines, any size, shall include all labor, materials and equipment required to install up to 25 linear foot of water service line according to City Standard D220-D223. When the service requires more than 25 linear foot of line, the additional length shall be paid by the foot under the appropriate bid item.

# **OPERATING WATER SYSTEM**

# 803.1 OPERATIONS OF THE EXISTING WATER SYSTEM

<u>NOTE:</u> The contractor is required to provide the City a minimum of 24 Hour Advance notice for valve operation, wet taps, cut-ins, flushing and disinfection.

Waterline shutoffs shall be in accordance with the following procedures:

- 803.2 A waterline valve may not be operated without permission of <u>the Operation and</u> <u>Maintenance Contractor for</u> the water utility Superintendent of Construction and Maintenance or his designee. Only Contractors that have a contract with the City of Farmington to construct or modify the City's water system, will be eligible to operate valves and then only upon initial installation.
- 803.3 Request for water shutoff permits must be submitted two working days prior to the date of the required shutoff. Required shutoff permits can be made by calling the Construction Inspection Department (telephone # 599-1286) or Utilities Department (599-1315).
- 803.4 The Operation and Maintenance Contractor for the water utility Superintendent of Construction and Maintenance or his designee shall review the proposed valve operation as follows:
  - Determine that a shutoff is necessary or whether design or construction can be reasonably modified to alleviate a shutoff (E.G.-dry tap instead of insertion of fitting),
  - 2) Along with the Contractor and Engineer, determine method of making shutoff, i.e., the specific valves to be closed and lines to be taken out of service shall be defined,
  - 3) Date, time, and duration of shutoff information shall be provided to The Operation and Maintenance Contractor for the water utility.
- 803.5 It may be necessary to contact industry and commercial establishments to determine the effect of the shutoff on their operations and to make special provision for continuous water service, which will be the responsibility of <u>The Operation and</u> <u>Maintenance Contractor for</u> the water utility.

If required by the <u>Operation and Maintenance Contractor for</u> the water utility, the shutoff shall be performed at night if necessary for the convenience of the City and/or general public.

- 803.6 The Contractor shall contact <u>the Operation and Maintenance Contractor for</u> the water utility when the agreed upon procedure does not work as planned and obtain permission to modify the shutoff plan.
- 803.7 Prior to making the actual shutoff <u>the Operation and Maintenance Contractor for</u> the water utility should inspect the site to insure that all valves can be located and are in operating condition. A pre-trial shutoff can be made with the approval and supervision of City consultant or Engineering Division Inspectors. If valves cannot be located or are not in operating condition, the contractor should notify the field office as soon as possible. <u>The Operation and Maintenance Contractor for</u> the water utility personnel will locate the valves, make the necessary repairs or determine the alternate method of making the shutoff.
- 803.8 Emergency Breaks: <u>The Operation and Maintenance Contractor for</u> the water utility shall be notified immediately so that it may perform the shutoff.
- All existing valves within the construction area shall be kept accessible for use by the City. Valves that must be covered during pavement construction shall be raised to grade within three days after completion of base course construction. When activity requires short term covering of a valve, the valve shall be referenced and plainly marked at the site where the valve is located. A variance from this three day requirement may be granted by the City Engineer when requested in writing.

## 803.10 WET CONNECTIONS

A wet connection is defined as a connection to the existing system where a large volume of water must be disposed of along with pressure relieving procedures of a line at operating pressure. A small leak of water from a stub, valve or other items shall not qualify a connection to be considered "wet". The Contractor shall provide all necessary blocking, bracing and other necessary precautions to prohibit damage to the existing system or any other property or person.

# **IRRIGATION CLEANOUT**

# 804.1 <u>GENERAL</u>

Only standard manholes will be considered acceptable for irrigation cleanouts. See detail D102.

# 804.2 <u>PAYMENT</u>

Payment will include excavation, furnishing required materials, installation and backfill up to subgrade as shown in the City Standard D-602 on a unit cost basis.

#### **INSTALLATION OF SANITARY SEWER LINES**

#### 901.5.1 <u>REMOVING EXISTING SEWER PIPE</u> (Add the following)

Add the following to the section: Removal of existing sewer pipe shall be paid for on a unit price per lineal foot of pipe removed, which payment shall be full compensation for furnishing all labor and equipment for the removal, haul and disposal of the existing pipe.

The Items for removal, separation and disposal of listed pipe items requires the actual removal and separation of pipe form the excavation material and hauling off site separate from excavation. If pipe is adequately crushed so that the inspector allows the pipe to be backfilled into the trench or if the provisions of Section 920.4a are not met, <u>no payment</u> will be made under these items.

#### 901.5.2.1 <u>PIPE LAYING</u> (Add the following)

The type of pipe to be installed shall be one of the types designated by the City. Pipe shall be installed in accordance with the appropriate pipe laying handbook or manual and/or AWWA recommended pipe laying practice for the type of pipe being installed. The interior of the pipe shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during operations by plugging or other approved methods. The pipe Class shall be clearly indicated on each end of all pipe sections fittings. Bridging will not be allowed, grade shall be established prior to laying pipe.

#### Handling

Pipe and accessories shall be handled in such a manner as to insure delivery to the trench in sound, undamaged condition. Particular care shall be taken not to injure the pipe coating. No other pipe or material of any kind shall be placed inside of a pipe or fitting after the coating has been applied.

## Cutting

Cutting of pipe shall be done in a neat and workmanlike manner without damage to the pipe. Unless otherwise authorized by the Engineer cutting shall be done by means of an approved type of mechanical cutter with wheel cutters utilized where practicable. Burrs will be removed from all cuts by means of grinding or filing.

## Placing and Laying

Before installing ductile iron pipe, the pipe shall be inspected for defects and tapped with a light hammer to detect cracks. Defective, damaged or unsound pipe shall be rejected. Deflection from a straight line of grade as required by vertical curves, horizontal curves or offsets shall not exceed those specified in AWWA C-600. If the alignment requires deflection in excess of these limitations, special bends or a sufficient number of short lengths of pipe shall be furnished to provide angular deflection within the limit set forth.

#### Pipe Laid in Trench

The full length of each section of pipe shall rest solidly upon the bed, with recesses excavated to accommodate bells and joints. Any pipe that has the grade or joint distributed after laying shall be taken up and re-laid. Pipe shall not be laid in water or when trench or weather conditions are unsuitable for the work, except by permission of the Engineer.

When work is not in progress, open ends of pipe and fittings shall be securely closed so that no other substances will enter the pipes or fittings. Any section of the pipe found to be defective before or after laying shall be replaced with sound pipe at no additional expense to the City.

#### Water and Sewer Proximity

Water lines shall not be laid closer horizontally then ten feet from sewer lines and the water lines shall be at a higher elevation than the sewer. If this is not possible, separate trenches will be required and the water line shall be 6 inches above the sewer. When water and sewer lines cross each other, the water line shall be at least 6 inches above the sewer, otherwise, the sewer shall be ductile (PVC may be used with City Engineers approval). No joint shall be within ten feet of the crossing.

#### Excavation for Appurtenances

Excavation for structures related to the water or sewer line shall be sufficient to leave at least twelve (12) inches in the clear between their outer surfaces and the embankment or timber which may be used to hold and protect the banks. Any other depth excavation below such appurtenances that has not been directed by the City shall be considered as unauthorized and shall be filled with sand, gravel or concrete as directed and at the expense of the Contractor. Excavation for concrete structures may serve as the outside form, if in the opinion of the Engineer, the walls of excavation are smooth, and if a workmanlike finish can be assured utilizing this method.

#### Tracer Wire

Tracer wire shall be installed on sewer force mains (mainlines or service lines) per Section - 121 - Plastic Pipe

## Inspection of House Service Connection

All sewer house service connections replaced by the Contractor shall not be backfilled before inspection by the Construction Inspector.

#### Marking Sewer Stub-outs

All sewer stub-outs shall be marked by a clean out and riser (the cap on the riser shall be glued on) extending from the end of the stub-out to the surface of the ground. The riser shall be a minimum 3 feet above ground with a glued on cap, whose top has been painted green for sewer.

Sewer Tie into Existing System

Mainline extensions to the sewer system will not be tied into the existing sewer system until the new mainline extension has been inspected (i.e. videoed and approved by The Operation and Maintenance Contractor for, and accepted by, the City Engineer or his designee).

# 901.5.2.7.2 INSTALLATION OF PLASTIC SEWER PIPE (PVC)

- A. Installation of PVC sewer pipe shall be in strict accordance with Uni-Bell Plastic Pipe Association (UPPA) Recommended Practice for the Installation of Polyvinyl Chloride (PVC) Sewer Pipe, UNI-B-5-79.
- B. Pipe embedment material shall be Class I, II or Class III of Uni-B-5-79, Appendix

  Minimum compaction shall be 90% of relative density per ASTM D2049 for Class I & II material and 90% of standard proctor per ASTM D698 using ASTM D2167, D1556 or D2922 for Class III material. Consolidation by saturation shall not be used for Class III materials. All embedment materials shall pass a 1¹/₂" sieve.
- C. <u>All sewer lines shall be installed using a laser and shall run directly from manhole</u> <u>to manhole without deflection.</u>
- D. Pressure sewers shall be buried a minimum of 60" measured from finish grade to top of pipe.

# 901.6.5 EXCAVATION OF EXISTING PIPE AND MANHOLES

Due care shall be exercised during excavation near manholes. Any damage to the existing pipe or manhole structure shall be repaired at the Contractor's expense. The City will determine the extent of damage and the type of repairs necessary. Hand excavation at manholes may be necessary at the Contractor's option. Excavation at the manholes shall progress downward until the first joint of pipe connecting to the manhole is encountered. The joint will be exposed and the City will determine the disposition of the type of connection to be used between new and old pipe. Excavation shall then proceed up the pipe line re-moving the existing pipe as the work progresses until the first service tap is encountered. The service tap shall be excavated to a point where a satisfactory connection can be accomplished. Care shall be exercised in excavating the service tap to prevent damage of the existing pipe beyond point of connection. Pipe may be removed in any manner as required by the City. Pipe removed shall be hauled to points designated by the City as soon as practical. Old sewer pipe shall not remain on the job site for a period longer than 8 hours or overnight. Excavated pipe shall be hauled from the job site daily.

901.8.2.1 Delete in its entirety and replace with the following:

All new sewer lines shall be videoed by the City of Farmington's Operation and Maintenance Utility Contractor, and any needed repairs made by the contractor at his expense prior to acceptance of the sewer line and start of the one year warranty

period. The sewer line shall be videoed again prior to the expiration of the one year warranty period. The contractor shall make any needed repairs at his expense before issuance of final acceptance by the City Engineer or his designee.

901.8.2.2 Delete the last sentence in the paragraph and replace with the following:

If the sewer line and manholes are not properly cleaned by the contractor so that the video work can be completed, then the contractor shall incur all costs associated with cleaning and re-videoing the sewer lines and manholes. The contractor shall be responsible for these additional costs and will be billed by The Operation and Maintenance Contractor for the water/sewer utility.

# 901.**8.3** <u>BY-PASSING:</u>

Sewage flow from the collection system upstream of the section which is under construction shall be by-passed in a manner approved by the City. The upstream manhole of the section will be plugged by means which shall prevent passage of sewage into the construction area. Plugs shall be of the easily removable type which will not damage pipe or require loose material for the plugging operations.

By-passing pumps shall be of the positive action type and of a pumping capacity large enough to pump all sewage flow encountered. No surcharging of upstream piping will be permitted. A standby pump shall be on the job site to be used in the event of pump failure for any cause. By-pass pumps shall be gasoline or diesel powered. A sump may be constructed in the upstream manhole of size and depth to accommodate the suction requirements of the by-pass pumps used. Pumps shall be held to a practical minimum size. By-pass piping shall be adequately sized to carry all sewage flows pumped and shall be of an adequate size to pass such debris as may be encountered. Piping shall be continuous from manhole to manhole. Joints shall be tight and leak free at pumping pressures. Leaks at pipe joints or connection shall be immediately repaired and the entire area washed down with clean water. Pipe may be aluminum irrigation pipe or hose at the Contractor's option and as approved by the City.

By-pass operations including pipe alignments shall be conducted to minimize the interference with traffic and/or access to residences within the construction area. Where by-pass piping must be crossed by traffic, the pipe will be protected and protection will be provided for the public. Prevention of pipe breakage and subsequent sewage spills is primary to the health and welfare of the community and the Contractor shall take all precautions necessary to insure the health and safety of the public. Pipe protection ramps or devices shall be constructed to prevent damage to vehicles and shall provide an "easy-road" crossing. Baffles or diversions at the downstream manholes shall be constructed at the upstream inlet to prevent sewage from flowing back into the construction area. Flow through the down-stream manhole shall be maintained at all times. Baffles or diversions at the downstream manhole shall be at the Contractor's option.

Trash encountered at the intake of by-pass pumps shall be removed from the pump suction as quickly as possible. No accumulations of trash from sewage lines will be permitted. The Contractor shall provide plastic trash bags and receptacles which trash may be deposited in prior to removal from the site.

Upstream or downstream surcharging or overloading of pipe due to construction operation shall be the sole responsibility of the Contractor. The City will not be held responsible for any damage or claims of damage resulting from the operations of the Contractor.

# SANITARY SEWER SERVICE LINES

#### 905.3 MATERIALS

905.3.6 (Delete this section and add the followings)

Service lines: Pipe for service lines shall be PVC Schedule 40 pipe conforming to Section 129.2 of the New Mexico Standard Specifications for Public Works Construction, 1987 Edition, for depths to invert of less than 3 feet. For depths greater than 3 feet P.V.C. SDR-35 shall be used.

905.4 INSTALLATION

#### 905.4.2 <u>SERVICE LINES</u> (Add the following)

Taps: Mainline pipe shall be tapped using a tapping machine. Tap hole shall be bored to a clean circular hole in the plane of the pipe centerline. Holes shall be sized to receive a tap saddle of the type specified herein. Existing service lines will in general be four (4) inches in diameter. Facilities for making larger or smaller types shall be available for use during construction. Taps shall be placed in the upper quadrant vertical. No tap will be placed at the top of the pipe unless express permission has been obtained from the City.

Tapping Saddles: Saddles for connecting to mainline sewer pipe shall be constructed of VCP, PVC or C.I. material capable of withstanding pressure and chemical attack. One saddle size shall fit an eight (8) inch pipe. "Insert-a-tees" are also acceptable to the City.

#### 905.4.4 MARKING SEWER STUB OUTS

All sewer stub outs shall be marked with a clean out and riser (the cap on the riser shall be glued on) extending from the end of the stub out to the surface of the ground. The riser shall be cut off flush with the ground with a glued on cap, whose top has been painted green for sewer.

- 905.5.1 <u>RISERS:</u> Change the 15-feet in the section to 6-feet.
- 905.6.3 (Add the following)

Connections of New Service Line to Old Service Line

Where new service line is connected to old service line pipe, an adapter connector of the type specified in ASTM C-594 shall be used. The connector shall be the Type "A" elastomeric sleeve incorporating corrosion resistant tension bands. Shearings will be required when connecting to existing service lines. The old pipe shall be removed to a

point where the pipe is found to be in good condition and undisturbed or to the property line which ever occurs first.

Connections to the old pipe shall be tight and as leak-proof as condition of the old pipe warrants. Damage to existing service piping beyond the connection point is the sole responsibility of the Contractor.

# 905.6.4 <u>SEWER SERVICE ITEMS</u>

The unit price bid Item for four (4) inch sewer service tapping saddle, shall include all labor, equipment and materials necessary to tap an existing sewer main in the trench using a tapping machine. Materials shall include but not be limited to the following: PVC or VCP tapping saddle, gasket, epoxy and concrete cradle or dry packed as approved by the inspector. This item shall also include furnishing and installing strap type saddles as well as glued type when directed by the City. Saddles shall be single wide band (two inch wide strap) and/or double strap, stainless steel type.

The unit price bid for items for reconnecting existing sewer service of the type indicated, includes all labor, equipment and materials necessary to reconnect as existing sewer service to a tapping saddle installed under four (4) inch sewer services tapping saddle, are to be paid for sewer connections 10 feet in length. The cost of riser and pipe materials, gaskets, sleeves, bands, pipe cutting and excavation is to be included in the unit price bid for these items.

The unit price bid for a new service or reconnect sewer pipe up to 25 feet in length and for reconnecting existing sewer service shall include all labor, materials and equipment necessary to install four (4) inch pipe of the type indicated. Additional length will be paid under the appropriate bid item.

# 905.6.5 (Add the following to the section)

## EXISTING HOUSE SEWER LATERAL

Where house service line connections to sewer mains are encountered, the Contractor shall insure that the service lines will not be disturbed or damaged. Should any service line connection be broken during the construction of the new line, it shall be replaced by the Contractor with the same type pipe. In the case of a sewer service, the trench shall not be backfilled until the service line is inspected by the City Construction Inspector. Without an inspection no extra compensation will be allowed the contractor for this item. The City assumes no liability for damage to a replacement of house sewer and water service line connections. When a new sanitary sewer lateral is required as a replacement for an existing line, and the alignment of the new line coincides with the existing line or lower, then the existing line shall be removed or dealt with as ordered by the Engineer or Inspector. The cost of this work when applicable shall be paid for under the appropriate item in the Bid Proposal.

The Engineer or Inspector shall determine if it is necessary to pump sewage around the replacement work, or if it is possible to temporarily plug the sewer line during the replacement operation.

#### 905.6.6 (Add the following)

#### INTERRUPTION OF SERVICE

No more than four (4) sewer service lines may be removed from the service at any one time without written approval of the Owner. In no case may a sewer service be out of operation more than eight (8) hours. The Contractor shall give notification of service outage to each household affected at least twenty-four (24) hours prior to the service interruption. Failure to give notice will result in a work stoppage on that particular service until the specified period has elapsed or the expressed approval of the householder has been given to proceed with the service outage.

## 905.8 MEASUREMENT AND PAYMENT (Delete this section and add the following)

The unit price bid for four (4) inch sewer service tapping saddle, shall include all labor, equipment and materials necessary to tap an existing sewer main in the trench using a tapping machine. Materials shall include but not be limited to the following: PVC or VCP tapping saddle, gasket, epoxy and concrete cradle. Factory fabricated tees or wyes installed are not to be included in this item. Excavation for this item shall be paid under one of Bid Items for trench and backfill. All work to be as directed by the City. This item shall also include furnishing and installing strap type saddles as well as glued type when directed by the City.
## SANITARY AND STORM DRAIN MANHOLES

# 920.4.1.3 <u>MANHOLE CONSTRUCTION --- GENERAL</u> (This section is reproduced for convenience)

Invert elevations of the pipes entering or exiting the manhole and interior inverts shall not vary more than 0.05 feet from the elevations indicated on the construction plans. Spacing requirement for sanitary manhole will be at maximum of 400 feet while the requirement for storm drain manhole will be at maximum of 500 feet.

#### 920.4.4.1 <u>MANHOLES</u> (Add the following)

The inside and outside of all concrete block manholes shall be neatly plastered with Type PM or PL mortar as specified in ASTM C-476, ¹/₂" thick with cement as specified with Section 106 and cured as specified under Section 500. Manholes of the design indicated on the Construction Standards shall be built around the pipe at designated intervals, and shall be adjusted such that pipe joints at the point will be just outside the manhole barrel both upstream and downstream. These joints just outside the manhole barrel shall be reinforced with a U-1 concrete block, as specified in ASTM C-145, poured under the joint and including the lower one half of the pipe. This block of concrete shall be at least three (3) inches under and around the bell and shall extend at least six (6) inches on each side of the joint along axis of the pipe. Where manholes are constructed using pre-cast concrete blocks, all blocks shall be soaked or wetted prior to placing on mortar bed or placement of mortar joints. After the manhole has been constructed and a shelf of concrete has been poured on the bottom of the manhole at an elevation of  $\frac{1}{2}$ pipe diameter above invert elevation, the top ½ of the pipe through the manhole shall carefully be broken out and removed. All bases of manholes shall contain reinforcing steel furnished and placed by the Contractor in accordance to the details as shown on the Standard Manhole Detail Sheet. All manholes shall be plastered inside and outside. Plastering will not be applicable on pre-cast (Type 8-1 or C-1) manholes, unless specifically required by the Engineer.

# 920.7.4 <u>RESHAPE MANHOLE INVERTS</u>

Existing manhole inverts will be repaired and grouted in accordance with these specifications and the directions of the City.

A. Cleaning: The inverts of selected manhole will be cleaned by approved method to remove all foreign materials and loose concrete.

B. Invert Coating: Upon completion of cleaning, the Contractor shall reshape the invert to accommodate existing sewer lines with mortar that meets City Standards D-106.

#### 920.7.4.1 <u>MANHOLE REPAIR</u> (Add the following)

The interior of manholes will be sand blasted to remove all foreign materials. Sand blasting will extend to a depth sufficient to remove surface material without effecting

block strength. Penetration by sand blasting will be repaired with suitable material at no extra cost to the City.

#### 920.8 <u>MEASUREMENT</u>

Sewer Lines (Add the following)

All sewers, except for storm sewer cross drains, shall be measured and paid based on the actual length of pipe installed from center of structure to center of structure for the various sizes constructed.

Storm sewer cross drains (those installed from a drainage structure to an inlet) shall be paid based on the actual length of pipe used. The length so measured shall in no event be less than the distance from center of structure to center of structure.

Removal of Existing Water and Sewer Pipe

Removal of existing water and sewer pipe shall be paid for on a unit price per lineal foot of pipe removed, which payment shall be full compensation for furnishing all labor and equipment for the removal, haul and disposal of the existing pipe. This item includes the removal, separation, disposal and hauling to an approved landfill of various pipe sizes. If pipe is adequately crushed so that the Inspector allows the pipe to be backfilled into the trench, *no payment* will be made under this item.

Connection of Existing Lines

Connection of existing lines shall be paid for at the contract unit price by sizes stated in the Bid Proposal which shall be complete compensation of all materials furnished which shall include wastewater disposal, location of utilities, cutting into and removal of existing pipe, necessary blocking and bracing.

#### 920.8.1 <u>MANHOLES</u> (Delete this section and add the following)

The Contractor is to furnish all materials, labor, equipment and supplies necessary to excavate, backfill and construct complete in place the manholes as shown on the City of Farmington Construction Standards referred to in these specifications. The Contractor shall install one standard manhole frame and cover for each manhole constructed.

Manholes shall be paid at the unit price bid for the diameters and depths shown on the bid proposal. Depth in excess of 6 feet for type "B" manholes and in excess of 8 feet for type "E" manholes shall be paid on a vertical foot basis at the unit price in the bid proposal. Depth shall be measured from manhole rim to invert.

Replace manhole cone, shall include all materials, labor, and equipment necessary to excavate, backfill and construct a complete cone section concentric or eccentric. Manhole cone replacement shall include an area of asphalt of 5'x 5', any asphalt replacement in excess of this 25 SF shall be paid for under the asphalt surface course replacement bid item.

Manhole stub outs, includes all labor, equipment and materials necessary to install 5 foot max of any type of sewer pipe as a stub out of the size indicated. The type of pipe and length of the stub out is to be directed by the City.

Remove and abandon existing manhole shall include removing and disposing of the existing structure down at least three feet from proposed grade, compacted backfill, plugging all existing pipes and patching pavement.

The unit bid price per lineal foot for sanitary service lines and all items indicated shall include the furnishing and installation of the material and all trenching, backfill, compaction and removal of unsuitable material necessary to properly complete the work ready for use.

Sanitary Sewer or storm sewer Items noted with an * do <u>not</u> include any trenching and backfill or removal of unsuitable material. These sewer items do, however, include furnishing and installing items competed in place ready for use.

#### MANHOLE CONNECTIONS

(Add the following sections)

#### 930.1 <u>GENERAL</u>

This item will cover the labor, tools, equipment, and materials except pipe, required to make connections between new sewer lines and existing manholes.

#### 930.2 MATERIALS

New block or mortar required shall conform with ASTM C-139 and as described in Section 106.

#### 930.3 <u>CONSTRUCTION</u>

Where required to make a new connection to an existing manhole, a hole shall be driven through the manhole wall of a size sufficient to allow entrance of the pipe into the manhole while maintaining pipe alignment and grade. The new connection may be either inlet or outlet piping.

#### 930.4 <u>PAYMENT</u>

Payment for this item will be made at the unit price bid in the Proposal Schedule for each manhole connection, either inlet or outlet, and shall include labor, tools, equipment, materials, etc., necessary for completion of this work. Installation of pipe will be paid for separately under the applicable item.

## PIPE LAYING (RIGID PIPE)

## 940.1 <u>BEDDING</u>

Delete the sixth (6th) paragraph and substitute the following:

The bottom of the trench shall be rounded so that the bottom of the pipe for a width of 60% of the outside diameter shall rest firmly on a layer of sand or base course placed as leveling laying and bedding as shown on the plans. In rounding the bottom of the trench, a template shaped to match the pipe for the 60% width shall be used, and final shaping shall be done a few feet ahead of the pipe laying. Bell holes, where required, shall be carefully excavated to provide uniform bearing for the barrel of the pipe. This is class "B" bedding as shown on City Standard No. D-410.

#### 940.3 <u>PIPE LAID IN TRENCH</u>

The full length of each section of pipe shall rest solidly upon the bed, with recesses excavated to accommodate bells and joints. Any pipe that had the grade or joint distributed after laying shall be taken up and relayed. Pipe shall not be laid in water or when trench or weather conditions are unsuitable for the work, except by permission of the Engineer. When work is not in progress, open ends of pipe and fittings shall be securely closed so that no other substances will enter the pipes or fittings. Any section of the pipe found to be defective before or after laying shall be replaced with sound pipe without additional expense to the City. Fittings shall not be placed less than 20 feet from a restrained joint and must be meg-a-lugged as shown on the drawings or as directed by the City Engineer, to prevent the fittings from being blown off the line when under pressure. Thrust blocks may be used as approved by the City Engineer as per detail D210. Where connections are made between new work and existing lines, the connections shall be made by using special fittings as needed. Minimum depth of cover over top of pipe shall be forty (42) inches and the pipe shall be installed to the depth designated by the Engineer.

#### 940.4 <u>CONNECTIONS</u>

Where connections are made between new work and existing lines, the connections shall be made using special fittings. Couplings may be either ductile iron or steel with bolts as above. If steel couplings are used, they will be cocoon wrapped as specified herein.

#### 940.5 WATER AND SEWER PROXIMITY

SEE SECTION 901.5.2.1 WATER AND SEWER PROXIMITY

940.7 EXCAVATION FOR APPURTENANCES

Excavation for structures related to the water or sewer line shall be sufficient to leave at least twelve (12) inches in the clear between their outer surfaces and the embankment or timber which may be used to hold and protect the banks. Any over depth excavation below such appurtenances that has not been directed by the City shall be considered as unauthorized and shall be filled with sand, gravel or concrete as directed and at the expenses of the Contractor.

Excavation for concrete structures may serve as the outside form, if in the opinion of the Engineer, the walls of excavation are satisfactory and the concrete will not dry out too rapidly and if a workmanlike finish can be assured utilizing this method.

#### 940.8 HOUSE SERVICES CONNECTIONS

Where existing water and gas house lateral connections to utility mains are encountered, the Contractor shall exercise due care to insure that the laterals are not disturbed or damaged. Should any lateral connections be broken, as a result of the work under this contract, it shall be replaced by the Contractor with the same type pipe or better. All house sewer service connections replaced by the Contractor shall not be backfilled prior to approval by the Construction Inspector.

# 940.10 MARKING BLIND FLANGES AND SEWER STUB OUTS

All sewer stub-outs shall be per the City of Farmington standard detail drawing D-115 latest revision. The riser shall be 3 foot above ground with a glued on cap, whose top has been painted green for sewer.

# **SLIPLINE REMOVAL**

# 960.1 <u>GENERAL</u>

This item shall include the length of lining that is removed in the slip lining of a sewer that is then replaced with laid 8 inch PVC.

# 960.2 MEASUREMENT AND PAYMENT

Slip line removal shall be paid by a lineal foot cost under the applicable bid item.

#### SEWER MAINLINE REPAIRS

#### 97**1**.1 <u>GENERAL</u>

This item shall include providing equipment, labor, and material to cut, remove and replace asphalt surface (winter or summer time asphalt), excavation of existing sewer **line**, removal and replacement of **sewer pipe**, removal of existing tapping saddle, reconnecting sewer service connection and sewer line, making necessary repairs to service line at original trench edge connection, backfill and compaction of Base Course for pipe bedding and backfill material, mobilization and demobilization. All other requirements to make the necessary repair shall be incidental to construction.

#### 971.2 MEASUREMENT AND PAYMENT

Sewer **Mainline** Repairs shall be paid by the each under the applicable bid item. Mobilization shall be considered incidental to the sewer **mainline** repair and shall not be paid for under the mobilization bid item.

# MOBILIZATION

# 1502.1 <u>GENERAL</u>

Mobilization, unless specifically included by the City Engineer, shall be considered incidental to construction of the project and no direct compensation shall be made for mobilization. The costs associated with mobilization shall be incorporated into the appropriate bid items.

#### 1502.2 MEASUREMENT AND PAYMENT

No direct payment will be made for mobilization.

# **RESTORE YARDS**

# 1503.1 <u>GENERAL</u> (Add the following)

This item will cover all equipment and labor required to restore the effected property to its pre-existing state prior to any construction work. The Contractor shall obtain color photographs of each property before and after construction. These photographs will be submitted to the owner after said work is completed.

#### 1503.2 <u>PAYMENT</u>

This item is considered incidental to all other applicable bid items unless specifically included in a work order.