

8. CITY OF ROYSE CITY SPECIAL PROVISIONS

SECTION I GENERAL PROVISIONS

SECTION II MATERIALS AND CONSTRUCTION METHODS

SECTION I - GENERAL PROVISIONS

STANDARDS:

All work included as a part of this contract shall be performed in accordance with the Standard Specifications for Public Works Construction, North Central Texas, 4th Edition, 2004, except where noted otherwise in the City of Royse City's supplemental Special Provisions, the Special Conditions included in these Specifications and Contract Documents.

NOTE: The * symbol specifies that this item is also covered in the City of Royse City's "Special Provisions" to the "Standard Specifications for Public Works Construction, North Central. Texas". These Special Provisions are additional and modify the "Standard Specifications".

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Division 100 - General Provisions TOC (GP-1A) 10-2004

CITY OF ROYSE CITY, TEXAS
SPECIAL PROVISIONS
TO THE
NORTH CENTRAL TEXAS STANDARD SPECIFICATIONS
FOR PUBLIC WORKS CONSTRUCTION

PART I - GENERAL PROVISIONS

DIVISION 1: PROPOSAL REQUIREMENTS AND OTHER GENERAL CONDITIONS

The General Provisions of the North Central Texas Standard Specifications shall be modified and clarified by the addition to the following requirements to the various items. Except when specifically stated, none of the requirements of the General Provisions shall be deleted.

ITEM 102.11. REJECTION OF PROPOSALS

Change the second sentence of Item 102.11 to read: "Proposal shall be rejected for any of the following specific reasons, but not necessarily limited thereto:"

ITEM 102.12. DISQUALIFICATION OF BIDDERS

Change the first sentence of Item 102.12 to read, "Bidders may be disqualified and their proposal not .considered for any of the following specific reasons, but not necessarily limited thereto:"

ITEM 103.2. AWARD OF CONTRACT

It is the intention of the Owner to award a contract for the work included in this project on the basis of the lowest acceptable bid submitted by a qualified bidder, as determined by the Owner.

Within five (5) working days after the bid opening, the low bidder shall submit such evidence as the Owner may require establishing the bidder's qualifications to satisfactorily perform the work included in this project. Information that may be required shall include the following:

- (1) Current Financial Statement.
- (2) Letter of Auditor's opinion.
- (3) Previous years Balance Sheet, Income Statement and Change of Financial Position.
- (4) List of projects that have been satisfactorily completed by the Bidder that are of the same general type as included in this contract, together with names, addresses and phone numbers or persons familiar with this work.
- (5) Other information that may be pertinent to the Bidder's Qualifications.

Should the bidder fail to produce evidence satisfactory to the Owner on any of the foregoing points he may be disqualified and the work awarded to the next bidder so qualifying.

The Owner will notify the successful bidder, in writing, within sixty (60) days after the date of receiving bids, of the acceptance of the proposal. The Contractor or Contractors shall complete execution of the required Bonds and Contract within ten (10) days of such notice.

ITEM 103.3. SURETY BONDS

Performance Payment and Other Bonds

Contractor shall furnish Performance and Payment Bonds as security for the faithful performance and payment of all his obligations under the Contract Documents. These Bonds shall be, at all times, in amounts equal to the total Contract Price (100%), and in such form as set forth in the Contract Documents and with such corporate sureties as are licensed to conduct business in the state where the Project is located and, are named in the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Federal Register by the Audit Staff Bureau of Accounts, U.S. Treasury Department. The Performance and Payment Bonds shall be expanded to include any extension of the Contract Period of total Price.

If the surety on any Bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business in terminated in any state where any part of the Project is located in revoked, Contractor shall within five (5) days thereafter substitute another Bond and surety, both of which may be acceptable to the City.

Additional Bonds

Prior to delivery of the executed Contract by City to the Contractor, City may require CONTRACTOR to furnish such other Bonds in such form and with such sureties as the City may require.

ITEM 103.4. INSURANCE

Add the following:

Additional Insurance

Prior to delivery of the executed Contract by City to the Contractor, City may require CONTRACTOR to furnish such additional insurance in such form and with such insurers as the City may require.

ITEM 103.6. NOTICE TO PROCEED AND COMMENCEMENT OF WORK

Upon Owner's receipt of the executed Contract and the required insurance and surety bonds, a Notice to Proceed shall be issued by the Owner indicating the date upon which the Contract time shall start and the projected date of completion. The Owner will attempt to provide the work order within the time specified in the Specifications. The Contractor shall commence work within 10-days from the date specified in the written work order. No work shall commence before the notice to proceed has been issued.

ITEM 104.2. CHANGE OF MODIFICATION OF CONTRACT

Item 104.2.3. Extra Work

No work shall be undertaken which requires extra payment without having an executed change order approved by the Contractor and the Owner, except when so ordered in writing.

ITEM 105.1. CONTRACT OF DOCUMENTS

Item 105.1.1. Priority of Contract Documents

Revise this item to read:

In case of conflict between contract documents, priority of interpretation shall be in the following order: signed agreement, performance and payment bonds, addenda, special conditions, project drawings and specifications, City of Royse City Special Provisions to the Standard Specifications for Public Works Construction - North Central Texas, standard drawings, advertisement for bids, contractor's bid proposal and bid form.

Item 105.1.3. Contract Drawings and Specifications

In general, the number of copies of the plans and specifications furnished to the Contractor shall be limited to five (5). Additional copies may be obtained at cost of reproduction.

ITEM 105.2. WORKMANSHIP, WARRANTIES AND GUARANTEES

Item 105.2.2. Special Warranty

Add the following:

The Contractor shall provide a Maintenance Bond in the amount of fifty percent (50%) of the total amount of the contract guaranteeing the work in accordance with the plans and specifications for a period of two (2) years after acceptance by the City of Royse City. This bond shall provide for repair and/or replacement of all defects due to faulty material and workmanship that appear within a period of two (2) years from the date of completion and acceptance of the improvements by the City of Royse City.

ITEM 105.3 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

Review of Shop Drawings by the Engineer shall be of the sole purpose of determining the sufficiency of the said drawings or schedules to result in finished improvements in conformance with the plans and specifications, and shall not relieve the Contractor of his duty as an independent contractor. It being understood and agreed that the Engineer does not assume any duty to pass upon the propriety or adequacy of such drawings or schedules or any means or methods reflected thereby in relation to the safety of either person or property during the Contractor's performance hereunder.

ITEM 105.4 CONSTRUCTION STAKES

Delete in its entirety and substitute therefore the following:

The City of Royse City will furnish and set control stakes to establish the baseline (not layout stakes) for this project as follows:

1. Horizontal Control: Start of project, P.C.s, P.T.s, P.1., and end of project.
2. Vertical Control: Temporary benchmarks at 500 foot spacing on each section of the project.

The stakes set by the City of Royse City will be set sufficiently in advance of the work to avoid delay. The Contractor will be held responsible for the preservation of all stakes and marks, and if, in the opinion of the City of Royse City, any of the stakes or marks have been carelessly or willfully disturbed by the Contractor, the cost of replacing them will be charged against him and deducted from the payment for the work.

The Contractor shall furnish and set free of charge additional stakes and other materials and templates necessary for making and maintaining points and lines, including layout stakes, line and grade stakes for grading, paving, culverts, utilities, storm sewer lines and appurtenances.

The City of Royse City will perform such checking of the Contractor's stakes as considered necessary by the City of Royse City. Such checking by the City of Royse City will in no way release the Contractor of his responsibility for the correctness of the stakes or the responsibility for checking to insure that the work is constructed to the lines and grades as shown on the plans.

Establishment of the aforementioned lines and grades by the Owner shall in no way release the Contractor of the responsibility of the correctness of the stakes or the responsibility for checking to insure that the work is constructed to the lines and grades as shown on the plans.

ITEM 105.9. INSPECTION

Item 105.9.2 Final Inspection

Within ten (10) days after the Contractor has given the Engineer written notice that the work has been completed, or substantially completed, the Engineer and the Owner shall inspect the work and within said time, if the work be found to be completed or substantially completed in accordance with the Contract Documents, the Engineer shall issue to the Owner and the Contractor his Certificate of Completion, and there upon it shall be the duty of the Owner within ten (10) days to insure a Certificate of acceptance of the work to the Contractor or to advise the Contractor in writing of the reason for non-acceptance.

ITEM 105.10 ACCEPTANCE

Within ten (10) days after the Contractor has given the Engineer written notice that the work has been completed, or substantially completed, the Engineer and

the Owner shall inspect the work and within said time, if the work be found to be completed or substantially completed in accordance with the Contract Documents, the Engineer shall issue to the Owner and the Contractor his Certificate of Completion, and there upon it shall be the duty of the Owner within ten (10) days to insure a Certificate of acceptance of the work to the Contractor or to advise the Contractor in writing of the reason for non-acceptance.

Definition of Substantially Complete: The date of substantial completion of a project or specified area of a project is the date when the construction is sufficiently completed, in accordance with the contract documents, as modified by any change order agreed to by the parties, so that the Owner can occupy or utilize the project or specified area of the project for the use for which it was intended.

ITEM 107.2. INDEMNIFICATION

Delete Item 1.22.2 in its entirety and substitute therefore the following:

The Contractor and his sureties shall indemnify, defend and save harmless the OWNER and all of its officers, agents and employees, ENGINEER and all of its officers and employees from all suits, actions or claims of any character, name and description brought for or on account of any injuries, including death or damages received or sustained by any person, persons or property on account of the operations of the Contractor, his agents, employees or subcontractors; or on account of any negligent act or fault of the Contractor, his agents, employees or subcontractors in the execution of said contract; or on account of the failure of the Contractor to provide the necessary barricades, warning lights or signs; and shall be required to pay any judgment, with cost, which may be obtained against the Owner or Engineer growing out of such injury, including death or damage.

ITEM 107.9. PERFORMANCE OF THE WORK

Add the following to the end of the first paragraph: “regardless of the expected completion date set forth in the Contract Documents.”

At such time as actual construction has been started, the work will not be stopped or delayed without written permission of the Owner, excluding delays caused by adverse weather conditions. The Contractor shall maintain at all times sufficient equipment and personnel on the project to produce satisfactory progress during the construction period.

ITEM 107.13. EQUAL EMPLOYMENT OPPORTUNITY

Delete the last paragraph in this item in its entirety (107.13.5. – Reports).

ITEM 107.14. STATE AND LOCAL SALES AND USE TAXES

Delete in its entirety and substitute therefore the following:

Recent legislation has removed the sales tax exemption previously provided by Section 151.311 of the Tax Code covering tangible personal property purchased by a contractor for use in the performance of a contract for the improvement of City-owned realty.

It is still possible, however, for a contractor to make tax-free purchases of tangible personal property that will be incorporated into and become part of a City construction project through the use of a “separated contract” with the City. A “separated contract” is one, which separates charges for materials from charges for labor. Under such a contract, the contractor becomes a “seller” of those materials, which are incorporated into the project, such as bricks, lumber, concrete, paint, etc. The contractor issues a resale certificate in lieu of paying the sales tax at the time such items are purchased. The contractor then receives an exemption certificate from the City for those materials. (This procedure may not be used, however, for materials, which do not become a part of the finished product. For example, equipment rentals, form materials, etc. are not considered as becoming “incorporated” into the project.)

Utilization of this “separated contract” approach eliminates the need for bidders to figure in sales tax for materials, which are to be incorporated into the project. Bid items, which contain non-taxable materials, are identified in the Bid Schedule for this project. The successful bidder will be required to complete a Contract Form provided by the Owner identifying and separating non-taxable materials from the labor and taxable materials which are not incorporated into the finished project. The completed contract form will be used to develop the “separated contract” and will determine the extent of the tax exemption.

ITEM 107.19. PROTECTION OF WORK AND OF PERSONS AND PROPERTY

Item 107.19.2. Protection of Persons and Property

The Contractor shall at all times exercise reasonable precautions for the safety of employees and others on or near the work and shall comply with all applicable provisions of Federal, State, and Municipal safety laws and building and construction codes. All machinery and equipment and other physical hazards shall be guarded in accordance with the “Manual of Accident Prevention in Construction” of the Associated General Contractors of America except where incompatible with Federal, State, and Municipal laws or regulations. The Contractor shall provide such machinery, guards, safe walkways, ladders, bridges, gangplanks, and other safety devices. The safety precautions actually taken and their adequacy shall be the sole responsibility, of the Contractor, acting at his discretion as an independent contractor.

SECTION II - MATERIALS AND CONSTRUCTION METHODS

STANDARDS:

All work included as a part of this contract shall be performed in accordance with the Standard Specifications for Public Works Construction - North Central Texas, 4th Edition, dated 2004, except where noted otherwise in the City of Royse City's supplemental "Special Provisions", the Special Conditions, and the Special Specifications included in these Specifications and Contract Documents.

NOTE: The * symbol specifies that this item is also covered in the City of Royse City's "Special Provisions" to the "Standard Specifications for Public Works Construction, North Central Texas". These Special Provisions are additional and modify the "Standard Specifications".

<u>Item #</u>	<u>Subject</u>
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CITY OF ROYSE CITY, TEXAS
SPECIAL PROVISIONS
TO THE
NORTH CENTRAL TEXAS STANDARD SPECIFICATIONS
FOR PUBLIC WORKS CONSTRUCTION

MATERIALS AND CONSTRUCTION METHODS

The North Central Texas Standard Specifications shall be modified and clarified by the addition of the following requirements to the various items. Except when specifically stated, none of the requirements shall be deleted.

DIVISION 200 – SITE PROTECTION AND PREPARATION

ITEM 201.16 MULCHING

Slope and drainage channel seeding shall be in conformance with Item 201.16. Hydromulch Seeding mixture and rate shall be as required under Item 202.6:

ITEM 202.2 TOPSOIL

202.2.3. Construction Methods

Add the following:

A minimum of four (4) inches of topsoil shall be provided on all major thoroughfare medians and rights-of-way and on all earthen channel slopes. This will be material imported from off site. The City will approve material prior to placement.

ITEM 202.6 SEEDING TURF-GRASS

Delete the mixture, rate, and planting dates and substitute:

Type I Unhulled Perennial Bermuda: Reserve and Spangle Top Grass Seeds
(September – March)

Type II: Perennial Bermuda Grass – Unhulled: (April – August)

A mix of seed shall be used in overlapping seasons.

202.6.4 Construction Methods

Add as follows:

All seeding operations shall be performed by either “Drilling” or “Cultipacker” process or approved equivalent. Seed shall be covered by + ¼” Topsoil.

202.6.4.1 Description

Add the following:

The Contractor shall maintain the seeded areas including watering until a “Stand of Grass” is obtained. A “Stand of Grass” shall consist of **75% to 80%** coverage, a minimum of one (1) inch in height. Re-seeding will be required in washed areas.

ITEM 203.3 GENERAL SITE PREPARATION

203.3.2 Construction Methods

Add the following: Unless otherwise approved in writing by the City of Royse City, where excavation to grade established in the field by the Owner terminates in loose or solid rock, the Contractor shall excavate 6-inches below the required subgrade elevations for the entire roadbed width and shall backfill with suitable selected materials as indicated on the plans. Suitable selected material shall include lime treated subgrade or a base material having a plasticity, index not greater than 12. Payment for such work will be made under the items of unclassified street excavation, lime treated subgrade and hydrated lime. The 6-inch lime treated subgrade or base shall be compacted to 95% density.

ITEM 203.7 EMBANKMENT

203.7.2 Construction Methods

Add the following paragraph: Excavated material from the channel which is used as embankment to complete the established alignment, grade and cross-section of the channel shall be compacted to 95% density.

203.7.3 Density

Add: Embankment in the City of Royse City shall be compacted to not less than 95% of the maximum density.

DIVISION 300 – ROADWAY CONSTRUCTION

ITEM 301 SUBGRADE, SUB-BASE & BASE PREPARATION

301.1 General

Construction Methods

Add the following: Prior to final compaction of subgrade, samples of the subgrade material shall be collected by a testing laboratory approved by the City, and laboratory tests made to determine the amount of lime required.

The application rate for hydrated lime shall be selected to obtain at least the optimum lime percentage indicated by test method ASTM C977-83a, Appendix XI; however, not less than 27 lbs. per S.Y. shall be applied. A Geotechnical Engineer's report reflecting the recommended application rate and including supporting test data shall be submitted in writing to the City, for approval prior to beginning any lime treatment. Laboratory test may be waived provided a minimum of 36 lbs. per S.Y. is applied.

ITEM 301.2 LIME TREATMENT (Add the following)

The lime treated subgrade shall be moist cured until covered by other base or pavement up to fourteen (14) days after final compaction. After 14 days without covering an application of 0.10 to 0.20 gallons per square yard emulsified asphalt shall be applied at the Contractor's expense. Reapplication of emulsified asphalt may be required if lime treated subgrade is not covered shortly after first application. Lime treated subgrade may be covered by other base or Pavement when density of 95% of maximum at optimum moisture content is obtained.

301.2.1.2 Quicklime (dry) shall not be used in the construction of roadway work in the City.

ITEM 301.3 PORTLAND CEMENT TREATMENT

Add the following: Portland cement modification of subgrade soils is not approved in Royse City. Subgrade soils means natural ground or embankment encountered in the construction.

ITEM 301.5 FLEXIBLE SUB-BASE OR BASE (CRUSHED STONE / CONCRETE)

General: Add the sentence: No local limestone material shall be used as flexible base (crushed limestone) on Royse City paving projects, unless otherwise shown on the plans.

ITEM 302 ASPHALT PAVEMENT

ITEM 302.2 AGGREGATE FOR HOT-MIX ASPHALT PAVEMENT

Central Mixing Plant

Add the following: When a fly ash admixture is used with Type I cement in the production of Portland cement concrete, separate silos shall be provided for fly ash and cement and provisions shall be made for individual measurements.

Finishing

Add the following: The finished concrete pavement construction under these specifications is expected to meet certain quality standards for surface of the concrete including the durability, texture, riding surface and appearance. The surface must be durable, firm, dense and well bonded to the aggregate to maintain an appearance and texture which is satisfactory to the Owner. Concrete pavement having a poor surface which has spalled (exposed aggregate) due to poor quality paste, high water-cement ratio, over-vibration, improper curing, extreme weather or any other reason, or does not have a satisfactory riding surface shall be removed and replaced at the Contractor's expense. It is extremely important that the Pavement have a good rideable surface, free from undulations and rough joints. The City Engineer shall determine the acceptability of the Pavement.

- Machine Finishing

Machine finishing of pavement shall include the use of power-driven spreaders, reciprocating type power-driven vibrators, power-driven transverse strike-off, and screed.

The concrete pavement shall be consolidated by a reciprocating type mechanical vibrator. As soon as the concrete has been spread between the forms, the mechanical vibrator shall be operated to consolidate the concrete and remove all voids. Hand manipulated vibrators shall be used for areas not covered by the mechanical vibratory unit.

The transverse finishing machine shall first be operated to compact and finish the pavement to the required section and grade, without surface voids. The machine shall be operated over each area as many times and at such intervals as directed. At least two trips will be required and the last trip over a given area shall be a continuous run of not less than 40 feet. After completion of finishing with the transverse finishing machine a transverse drag float may be used.

After the floating has been completed and the excess water removed, but while the concrete is still plastic, the surface of the concrete shall be tested for trueness with an approved 10-foot steel straightedge furnished by the Contractor. The straightedge shall be operated from the side of the pavement, placed parallel to the pavement centerline and passed across the slab to reveal any high spots or depressions. The straightedge shall be advanced along the pavement in successive stages of not more

than one-half its length. Practically perfect contact of the straightedge with surface will be required, and the pavement shall be leveled to this condition, in order to insure conformity with the surface test required below after the pavement has fully hardened and to insure a smooth rideable surface. Any correction of the surface required shall be accomplished by adding concrete if required and by operating the longitudinal float over the area. The surface test with the straightedge shall then be repeated.

After completion of the straightedge testing and surface correction the surface of the pavement shall be finished by an approved method. Methods available for pavement surface finish including a burlap drag finish, a broom finish or a belt finish. Unless otherwise shown on the plans, the pavement surface shall be finished with the burlap drag.

a. Burlap Drag Finish

If the surface texture is to be a drag finish, a drag shall be used; it shall consist of a seamless strip of damp burlap or cotton fabric, and it shall produce a uniform surface of gritty texture after dragging it longitudinally along the full width of pavement. For pavement 16 feet or more in width, the drag shall be mounted on a bridge which travels on the forms. The diameter of the drag shall be such that a strip of burlap or fabric at least 3 feet wide is in contact with the full width of pavement surface while the drag is used. The drag shall consist of not less than two layers of burlap with the bottom layer approximately 6 inches wider than the upper layer. The drag shall be maintained in such a condition that the resultant surface is of uniform appearance and reasonably free from gravels over 1/16-inch in depth. Drags shall be maintained clean and free from encrusted mortar. Drags that cannot be cleaned shall be discarded and new drags substituted.

b. Broom Finish

If the surface texture is to be broom finished, it shall be applied when the water sheen has practically disappeared. The broom shall be drawn from the center to the edge of the pavement with adjacent strokes slightly overlapping. The broom operation shall be so executed that the corrugation produced in the surface shall be uniform in appearance and not more than 1/16-inch in depth. Brooming shall be completed before the concrete is in such condition that the surface will be torn or unduly roughened by the operation. The surface thus finished shall be free from rough and porous areas, irregularities, and depressions resulting from improper handling of the broom. Brooms shall be of the quality, size, and construction and shall be operated to produce a surface finish meeting the approval of the Owner. Subject to the approval of the Owner, the Contractor may be permitted to substitute mechanical brooming in lieu of the manual brooming as herein described.

c. Belt Finish

If the surface texture is to be belt finish, when straightedging is completed and after sheen has practically disappeared and just before the concrete becomes non-plastic, the surface shall be belted with a 2-ply canvas belt not less than 8 inches wide and at least 3 feet longer than the pavement width. Hand belts shall have suitable handles to permit controlled, uniform manipulation. The belt shall be operated with short strokes transverse to the centerline and with a rapid advance parallel to the centerline.

• Hand Finishing

Hand finishing of concrete pavement will be permitted in areas where it is not practical or possible to construct with finishing machines. These areas include, but are not

limited to, intersections, left turn, lanes, crossovers, transition areas and where the pavement width is not uniform. In all hand finished areas, one-half (1/2) extra sack of cement per cubic yard of concrete shall be used in the mix. In hand finished areas, the concrete shall be struck off with an approved strike-off screed to such elevation that when consolidated and finished the surface of the pavement shall conform to the required section and grade. The strike template shall be moved forward with a combined transverse and longitudinal motion in the direction the work is progressing, maintaining a slight excess of material in front of the cutting edge. The concrete shall then be tamped with an approved tamping template to compact the concrete thoroughly and eliminate surface voids and the surface screeded to required section. After completion of a strike-off, consolidation and transverse screeding, a hand-operated longitudinal float shall be operated to test and level the surface to the required grade.

Workmen shall operate the float from approved bridges riding on the forms and spanning the pavement. The longitudinal float shall be held in contact with the surface and parallel to the centerline and operated with short longitudinal strokes while being passed from one side of the pavement to the other. If contact with the pavement is not made at all points, additional concrete shall be placed, if required, and screeded, and the float shall be used to produce a satisfactory surface. Care shall be exercised to keep the ends of the float from digging into the surface of the pavement. After a section has been smoothed so that the float maintains contact with the surface at all points in being passed from one side to the other, the bridges may be moved forward half the length of the float and the operation repeated. Other operations and surfaces tests shall be as required for machine finishing.

- Edging at Forms and Joints

After the final finish, but before the concrete has taken its initial set, the edges of the pavement along each side of each slab, and on each side of transverse expansion joints, formed joints, transverse construction joints, and emergency construction joints shall be worked with an approved tool and rounded to the radius required by the plans. A well-defined and continuous radius shall be produced and a smooth, dense mortar finish obtained. The surface of the slab shall not be unduly disturbed by tilting of the tool during use.

At all joints, any tool marks appearing on the slab adjacent to the joints shall be eliminated by brooming the surface. In doing this, the rounding of the edge shall not be disturbed. All concrete on top of the joint filler shall be completely removed.

All joint shall be tested with a straightedge before the concrete has set, and correction shall be made if one side of the joint is higher than the other or if they are higher or lower than the adjacent slabs.

ITEM 303 PORTLAND CEMENT CONCRETE PAVEMENT

ITEM 303.8 PAVEMENT TESTING AND EVALUATION

303.8.2 Pavement Thickness Test

Delete in its entirety and substitute therefore the following:

Upon completion of the work and before final acceptance and final payment shall be made, pavement thickness tests shall be made by the Contractor. Tests shall be made at 400-foot spacings along the length of the pavement. In the event a deficiency in the thickness of pavement is revealed, two (2) subsequent sets necessary to isolate the deficiency shall be made - one at a jointed section prior

to the deficient station and one at a jointed section following the deficient station. Additional tests shall be obtained as necessary, at jointed section intervals to isolate the deficient area. Removal and replacement of concrete shall extend to joint boundaries, the full width of pavement section. If the average thickness of pavement in a particular section is less than called for on the plans, the pavement section shall be removed and replaced with the correct thickness, extending to joint boundaries, the full width of the pavement section, at the Contractor's entire expense. No additional payment over the contract unit price shall be made for any pavement of a thickness exceeding that required on the plans.

303.8.3 Pavement Strength Test

Revise the first paragraph to read: During the progress of the work, the Inspector or a commercial laboratory shall cast test cylinders or beams to maintain a check on the strengths of the concrete being placed. Add the following sentence and table: A table titled "PAVEMENT STRENGTH REQUIREMENTS", is provided showing the required pavement thickness, 7-day strength, 28-day strength, minimum cement factor and maximum slump for each street type to be constructed in Royse City. Requirements for high strength pavement and less thickness is also shown if required by the City.

Add to the 5th paragraph: Test cores shall be obtained within five (5) working days after the 28-day test results have been provided by the commercial laboratory. All test cores shall be obtained by a commercial laboratory, at the Contractors expense. One (1) core shall be obtained in the immediate area of the deficiency and two (2) additional cores shall be obtained - one at a jointed section prior to the deficient station and one at a jointed section following the deficient station. Additional cores shall be obtained as necessary, at jointed section intervals to isolate the deficient area. Removal and replacement of concrete shall extend to joint boundaries, the full width of pavement section.

Amend the 2nd paragraph on Page 217 to read "Pavement not meeting the minimum specified 28-day strength after cores have been tested shall be removed and replaced at the Contractor's expense." Delete the table and the paragraph below it.

PAVEMENT STRENGTH REQUIREMENTS

Item No.	Street Type	Street Width (F-F)	Thick-ness	Compr. 7-Day	Strength 28-Day	Mm. Cement	Max. Slump
1.	Principal Arterial, Minor Arterial	2-33' & 2-24'	8"	2940	4,000	6.5	3"
2.	Collector (including office and comm. Street)	44' to 36'	8"	2500	4,000	6.0	3"
3.	Residential •	28'	6"	2500	4,000	6.0	3"

ITEM 305 MISCELLANEOUS ROADWAY CONSTRUCTION

ITEM 305.1 CONCRETE CURB AND GUTTER

305.1.3.2 Reinforcing Steel

All bars at splices shall be lapped a minimum of 30 diameters of the bar or 12-inches, whichever is greater.

ITEM 305.2 CONCRETE SIDEWALKS, DRIVEWAY APPROACHES, & BARRIER FREE RAMPS

305.2.2.2 Reinforcement

Revise the first sentence to read:

Driveway approaches and walk reinforcing shall be No. 3 bars on 24-inch centers.

305.2.3 Construction Methods

General: Add to end of first paragraph:

The drive approach shall have a minimum thickness equal to the thickness of the adjacent street or 6 inches, whichever is greater.

305.2.3.7 Joints

Revise second sentence to read:

Expansion joints shall be placed in the sidewalk at 20-foot intervals or as otherwise specified by the Owner.

DIVISION 400 – ROADWAY MAINTENANCE AND REHABILITATION

DIVISION 500 – UNDERGROUND CONSTRUCTION & APPURTENANCES

ITEM 501 UNDERGROUND CONDUIT MATERIALS

ITEM 501.4 CONCRETE PRESSURE PIPE AND FITTINGS

C302 Reinforced Concrete Pressure Pipe, Non Cylinder Type, for Water and Other Liquids, and C300 Reinforced Concrete Pressure Pipe, Steel Cylinder Type, for Water and Other Liquids are not approved for use in the City, unless otherwise shown in the plans or approved in writing. Reinforced concrete cylinder pipe in sizes 16 inches through 21 inches shall be Pretensioned Pipe Type C303. For pipe 42 inches in diameter and above the pipe shall be Prestressed Pipe Type C301. Between 24 inches and 36 inches the pipe furnished may be either type. All pipe shall be designed to withstand the working pressure and external load as shown in the plans.

ITEM 501.5 REINFORCE CONCRETE WASTEWATER PIPE WITH RUBBER GASKET JOINTS

ASTM Designation C76 and shall be of the Thick Wall Pipe design with aggregates consisting of limestone aggregate in the proportion of at least 75 percent by weight of the total aggregates, unless otherwise provided in the Special Conditions to the Specifications.

ITEM 501.7 DUCTILE-IRON PRESSURE PIPE AND FITTINGS (Add the Following)

Minimum design thickness for all Ductile-Iron Pipe installed shall be Class 50 on sizes 12 inches and smaller, and Class 51 on sizes 14 inches and larger.

ITEM 501.9 STEEL PIPE AND FITTINGS

501.9.2 Applicable Standard Specifications (Add the following)

Contractor shall, submit a written certification that the pipe has been manufactured and tested in accordance with the applicable standards.

The pipe shall be manufactured, fabricated, coated and lined by a single manufacture being a certified member in good standing of the Steel Plate Fabricators Association (SPFA).

501.9.3 Pipe and Fitting Requirements

Substitute the following for the sentence following (2) Wall Thickness: All steel pipe to be furnished for this project shall be designed in accordance with AWWA MI 1 for the most critical application of internal pressures and external loads. The following design conditions shall apply:

Internal Pressure (Design to account for working and surge together)

- 1) Working Pressure of 200 psi
- 2) Surge allowance of 250 psi

External Loading for Buried Pipe

- 1) External loads shall be comprised of the weight of the backfill together with live and' impact loads. Earth loads shall be calculated based on ditch and positive projecting conduit. The earth load for the pipe design shall be the greater of the above two conditions.
- 2) External live loads shall be at least equivalent to AASHTO HS-20 loading.
- 3) Modulus of soil reaction (E') < 1000 psi
- 4) Unit weight of fill (w) > 120 pcf
- 5) Deflection lag factor (DI) (1.0)
- 6) Bedding constant (K) = 0.100
- 7) hw = h = depth of cover above top of pipe
- 8) Maximum deflection in percent of pipe diameter 'shall be ad determined by AWWA MI 1, latest edition, as calculated using moment of inertia of steel cross section of pipe wall. Moment of inertia of cement mortar shall not be included in calculation of maximum deflection.

Available Deflections

Mortar-lined and coated = 2 percent of pipe diameter

Maximum Working Stress

The maximum combined stress based on working pressure shall be no greater than 50 percent of the minimum yield strength or 18,000 psi, whichever is less.

The maximum combined stress based on test pressure shall be no greater than 75 percent of the minimum yield strength or 24,000 psi, whichever is less.

501.9.4 Joints: Add the following:

In general, pipe joints shall be as follows, as indicated on the Drawings or as specified.

- 1) Flanged joints shall be provided as a minimum at all flanged valves, meters and other equipment.
 - a. Flanges: Unless otherwise noted, flanges shall conform to the requirements of AWWA C207, Table D, E or F as required.

- b. Flange Bolts and Nuts: Shall be furnished in size and numbers stipulated in AWWA C207. Unless otherwise indicated, bolts shall be carbon steel to meet the requirements of ASTM Designation A307, Grade B for regular joints.
- 2) Restrained Lap-Welded slip joints (expanded bell) with a single fillet weld.
 - 3) Carnegie-Shape Rubber Gasket Joint: Bell and spigot rubber gasket joint will be furnished with the bell end of the pipe mechanically expanded to the required internal diameter and the spigot end furnished as a sized Carnegie shape welded to the opposite end of the pipe. The expanded bell and Carnegie spigot shall be designed such that when the pipe is laid and jointed, it will be self-centered, and the O-ring rubber gasket will be enclosed tightly on all four sides and confined under compression adequate to ensure watertightness. Gaskets to be full-face for use with flat face flanges and ring type for use with raised face flanges. Gasket material for water service pipe shall be cloth inserted rubber sheet, 1/8-inch thick or red rubber, ASTM D1330, Grade 1. Gasket material for air piping shall be as above, but of EPDM.
 - 4) Mechanical Couplings: Mechanical couplings designed to provide a stress relieving flexible joint shall consist of a cylindrical sleeve, two gaskets, two follower rings and a set of bolts and nuts.
 - a. Sleeves: Manufactured of ASTM A53 steel, for sizes 10-inches and smaller. ASTM A36 steel for sizes 12-inches and larger. Minimum sleeve length shall be five inches for pipe 12-inches and smaller, 7-inches for pipe 14-inches through 24-inches, and 10-inches for pipe larger than 24-inches.
 - b. Follower Rings: Ductile Iron ASTM A536 or AISI CI 020 Steel.
 - c. Bolts and Nuts: High strength low alloy steel with heavy semi-finished hexagon nuts.
 - d. Gaskets: Shall be of synthetic rubber suitable for operating conditions.
 - e. Shop Finish: Manufacturer's standard unless otherwise noted.
 - f. Manufacturer: 'Baker 200, Dresser Style 39, Rockwell Series 411 or approved equal.

ITEM 502.3 FIRE HYDRANTS

502.3.1 Materials

All fire hydrants furnished shall conform strictly with the latest specification C-502 of the American Water Works Association Standards for dry barrel fire hydrants and must comply with the following supplementary details and changes or addition.

- (a) Inlet Connection: Unless otherwise specified the inlet connection shall be a six (6) inch standard mechanical joint complete with all joint accessories. The inlet shoe shall be cast of the same or stronger metal than the lower barrel to prevent impact damage of the shoe. The interior of the shoe, including the lower valve plate and/or cap nut shall have a protective epoxy

coating of at least 4 mils applied in the shop. If a cap nut is utilized it must be locked in place with a stainless steel lock washer or similar non-corrosive device and all machined surfaces must be protected from water intrusion to prevent corrosion and assure ease of field teardown or maintenance.

- (b) Main Valve: The main valve shall be reversible compression type, closing with the pressure and shall be not less than 5-1/4" in diameter. Composition of the main valve shall be molded rubber or neoprene having a durometer hardness of 90 \pm 5 and shall be not less than 1" thick to protect against hydrant chatter and give long term durability.
- (c) Outlet Nozzles: All hydrants shall be "three way", equipped with two hose nozzles and one pumper nozzle.
- (d) Diameter Outlet Nozzles: The hydrant shall have two hose nozzles, two and one-half (2-1/2") inches nominal I.D., and one pumper nozzle four and one-half (4-1/2") inches nominal I.D. with Natural Standard Hose Threads.
- (e) Nozzle Attachment: All nozzles shall be mechanically connected into the barrel and have "O" Ring pressure seals to provide a positive seal between nozzles and hydrant barrel. A suitable nozzle lock shall be provided and shall be stainless steel or bronze. Nozzles shall not be caulked in.

Nozzle caps shall be furnished with pentagon nut the same size as the operating nut. They shall be furnished with interior rubber gaskets that will seat against bronze nozzles. All caps shall be secured to hydrant barrel by heavy duty non-kinking chains with a chain loop on each cap that permits free turning of the cap, for speed and ease of removal by fire fighters.

- (f) Operating Nut: The operating nut shall be non-rising, pentagonal shape, measuring 1-1/8" at the top and 1-1/4" at the base from point to flat. Pentagon shall have a depth of at least one and one-quarter inch (1-1/4"). The hydrant shall be constructed in such a manner that the operating nut, "O" Rings and washers can be removed and replaced without removing the bonnet. All bearing surfaces of the operating nut shall be bronze.
- (g) Holddown Nut: Holddown nut must have integral weather seal. Resilient seal between holddown nut and operating nut shall prevent debris entry to protect operating nut from damage.
- (h) Lubrication Reservoir: The hydrant shall have a completely "O" Ring sealed oil reservoir with a minimum of two (2) "O" Ring pressure seals to prevent contamination of the oil around the operating parts of the hydrant. The oil reservoir shall be cast in such a manner that all operating parts shall be repairable without removal of the bonnet to facilitate repairs and shall be of a design that all bearing surfaces and threaded parts will be automatically lubricated upon each operation of the hydrant. If bearing surfaces are not lubricated, the design shall keep operating friction to a minimum. A high wear resistant thermoset plastic anti-friction washer shall be in place above the thrust collar to minimize operation torque and facilitate long term ease of operation~ The operating threads must be sealed against contact with water to all times regardless of open or closed position of main valve. The hydrant shall have the capability of field personnel to visually check oil level and add additional oil if needed. Filler and inspection plug shall be recessed or flush type.

- (i) Traffic Feature: Hydrants shall be “traffic model” having upper and lower barrel joined approximately two inches (2”) above the groundline by a breakable “swivel” flange providing 360 degree rotation of the upper barrel for nozzle positioning and must be capable of rotating barrel with line pressure on. The groundline shall not be less than eighteen inches (18”) below the centerline of the lowest nozzle and shall be clearly marked in a permanent manner on the lower barrel. A breakable stainless steel stem coupling shall join the two-piece stem adjacent to the ground line flange. Screws, clevis pins, fasteners or bolts used in the coupling shall be Series 300 stainless steel. The weakened portion of the stem coupling shall be located to divert pressure from the stem coupling directly to the upper and lower stems when torque is applied in seat ring removal.

Design of the coupling shall be such that when the coupling is broken, no part of the coupling will shatter or come loose and fall into hydrant and the break will not occur through the pins or bolts holding the coupling to the stem.

- (j) Drain Valve Assembly: Hydrants shall be equipped with two drain valves which drain the barrel when the hydrant is closed and seal shut when the hydrant is in the open position. The upper valve plate, seat ring and drain ring (shoe bushing) must be bronze and work in conjunction to form an all bronze drainway. Upper valve plate if not bronze, must be epoxy coated.

The bronze seat ring shall be a minimum 5-1/4” inside diameter and shall thread into a bronze drain ring forming an all bronze drainway with two (2) drain outlets for double protection against drain clogging and corrosive damage. All bronze components shall have less than 16% zinc alloy, Grade A to give high corrosion resistance as recommended in Section 2.1, Table I of American Water Works Association Standard C-502. Seat ring seals shall be “O” Rings. Hydrant shall be designed so that during opening and closing operation(s), water pressure force flushes the drain valve and drain openings to prevent clogging, thus allowing barrel drainage:

- (k) Repair: All internal operating parts shall be removable from above ground level with a lightweight stem wrench.
- (l) Provisions for Extension: All hydrants shall be capable of being extended to accommodate future grade changes without excavation. Extension of the hydrant shall be made by adding at the groundline flange a new coupling and stem section equal to the length of the extension. This must facilitate easy field grade adjustment.

Stem extensions made by adding new section of stem to the threaded section of the stem at the top of the hydrant will not be accepted.

Extension kits must be available from manufacturer in six-inch (6”) increments.

- (m) Pressure Loss and Working Pressure: Pressure loss through one (1) four and one-half inch (4-1/2”) nozzle at 1000 GPM shall not be more than 5.0 psi.

ITEM 502.6 VALVES

502.6.2 Resilient-Seated Gate Valves for Ordinary Water Works Service

Unless otherwise approved in writing, all Gate Valves for direct buried service in the City's distribution system, 6 inches through 12 inches in diameter, shall be Resilient Seated Gate Valves that conform strictly with the latest specification C-509 of the American Water Works Association Standards and must comply with the following supplementary details, changes or additions.

- (a) Body: Gate valves shall be iron body designed for a working pressure of 250 psi. All valves shall be hydrostatically tested at 200 psi and shell tested at 500 psi. Any leakage during testing shall be cause for rejection. For ease of repair the body, bonnet and stuffing box shall be flanged together with ASTM Grade B bolts and nuts. Each valve shall have the maker's initials, pressure rating, and year in which manufactured cast in the body.
- (b) Stems: Stems shall be machined from manganese bronze rod with an integral forged thrust collar machined to size. The stems shall be non-rising and equipped for nut operation, which shall be opened by turning to the left.
- (c) Stem Seals: The seals shall consist of two "O" rings above and one "O" ring below the thrust collar. An anti-friction washer shall be located above and below the thrust collar for operating torque.
- (d) Stem Nut: The stem nut shall be ASTM'B-62 bronze.
- (e) Resilient Wedge: The wedge shall be cast iron, fully encapsulated in molded rubber complying with ASTM D2000. Wedge must have molded wedge guides preventing the disc from tilting downstream during operation. Protective guide cap bearings made of polymer bearing material to provide a bearing interface between the wedge guide and valve interior.
- (f) Paint and Protective Coatings: All valves furnished under these specifications shall be painted on the exterior as specified in AWWA C509 with asphalt varnish.

All ferrous metal surfaces in the internal part of the valve shall be protected with a fusion epoxy coating 'to a nominal thickness of 10 mils for corrosion protection and shall be of a color that is easily identified as an epoxy coating.

The proguard fusion epoxy coating shall fully comply with AWWA C550 .and certified NSF 61. The coating shall be 'non-toxic and shall not impart taste to water. The coating must be formulated from materials deemed acceptable per the Food & Drug Administration Document Title 21 of the Federal Regulations of Food Additives, Section 121.2514 entitled Resins and Polymeric Coatings. The coating shall 'have a satin finish and shall be suitable for field overcoating and touchup with the same coating' material without sanding or special surface preparation, or application of heat in excess of room temperature.

- (g) Experience and Certification: Valves, furnished under these specifications, shall be manufactured by a firm that has been producing valves of this general type continuously for. the past 'five (5) years. Each company or.

manufacturer supplying valves under these specifications shall have on file, with the City of Royse City, approved records of experience and detailed drawings of the proposed valves. Drawings shall cover the specific valve to be furnished for installation and shall show all dimensions including metal thickness, construction details and materials used in all parts of the valve together with ASTM Designation and Structural properties of these materials.

The manufacturer shall furnish to the City of Royse City, a Certification that the valve complies with the specifications without any exceptions. This certification shall apply to specific valves being installed within the City water distribution system. The certification shall state (1) the number of valves covered by the certifications, (2) the Addition where valves are being installed or the Project Name, and (3) name of Contractor installing valves.

The City may require the Manufacturer, Supplier or Contractor to dismantle valves at any time to determine compliance with these specifications. Location of any valve within the City system, installed after adoption of these specifications, that does not meet the specifications completely shall be cause for prohibiting the future use of any valves from the same manufacturer.

- (h) Tapping Sleeves: The materials for tapping sleeve bodies shall be cast-iron or ductile-iron in accordance with AWWA Standard CI 10 (ANSI 21.10), in two sections, or halves to be bolted together with high-strength, corrosion resistant, low alloy steel bolts conforming to AWWA Standard C111 (ANSI 21.11).

Cast iron and ductile-iron sleeve shall be mechanical joint, or as specified, or dimensions to secure, proper fit on the type and class of pipe on which they are to be used. Each sleeve shall be furnished with a 3/8-inch test opening so that tests can be made prior to tapping. Opening shall be provided with a 3/8-inch bronze plug.

502.6.5 Butterfly Valves (Add the Following)

All Butterfly Valves for installation underground in the City's distribution system 16 inches through 48 inches shall be in accordance with this specification.

All butterfly valves furnished shall conform strictly with the latest specification C-504 of the American Water Works Association Standard for rubber-seated butterfly valves and must comply with the following supplementary details and changes or addition.

- (a) Body: The body shall be cast-iron ASTM A126, Class B and shall have face to face dimensions in accordance with AWWA Standards for short body, Class 150-B. All butterfly valves shall have a floating body seat ring to compensate for change in direction of flow to assure bottle-tight seal in either direction.
- (b) Shaft: Valve shafts shall be an 18-8, Type 304 stainless steel. Valve disc and shaft shall be standard self-adjusting Chevron "V" type packing. Shaft seals shall be of a design allowing replacement without removing the valve shaft.

- (c) Disc and Seat: The valve disc shall be cast iron ASTM A126, Class B. The valve seat shall be Buna-N located on the valve body. Valves 20" and smaller shall have a bonded seat that meets test procedures in ASTM D429, Method B. Valves 24" and larger shall be retained in the valve body' by mechanical means without the use of metal retainers or other devices located in the flow stream.
- (d) Operator: Butterfly valve operators shall be of the traveling nut design. All operators shall have adjustable mechanical stop limiting devices to prevent over travel of the disc. The operator shall have a mechanical stop which will withstand an input torque of 450 Ft. lbs. against the stop. The traveling nut shall engage alignment grooves in the housing.
- (e) Operation: Unless otherwise shown in the plans, all valves shall open counter clockwise.
- (f) Valve Ends: Valve ends shall be Mechanical Joint End, or Flanged Ends. Mechanical joint valves shall come complete with bolts, nuts, gaskets and glands. It shall be the responsibility of the Contractor to coordinate the ends of the adjoining pipe with the type valve end he proposes to use.
- (g) Testing: All valves seats shall be tested at 150 psi as described in AWWA C-504 and in addition shall have a shell test of 300 psi. Any leakage shall be cause for rejection.
- (h) Paint and Protective Coatings: All butterfly 'valves furnished under these specifications shall be painted on exterior as specified in AWWA C-504, with asphalt varnish.

All ferrous metal surfaces in the internal part of the valve shall be protected with a two-part thermoset epoxy coating to a nominal thickness of 4 mils for corrosion protection and shall be of a color that is easily identified as an epoxy coating. This shall be applied in shop.

The thermoset epoxy coating shall be a two-part epoxy and shall function as a physical, chemical and electrical barrier between the base metal to which it is applied and the surroundings. The coating shall be non-toxic and shall not impart taste to water. The coating must be formulated from materials deemed acceptable per the Food & Drug Administration Document Title 21 of the Federal Regulations of Food Additives, Section 121 .2514 entitled Resins & Polymeric Coatings. The coating shall have a satin finish and' shall be suitable for field overcoating and touchup with the same coating material without sanding or special surface preparation, or application of heat in excess of room temperatures.

- (i) Experience and Certification: Butterfly valves, furnished under these specifications, shall be manufactured by a firm that has been producing valves of this general type continuously for the past five (5) years. Each company or manufacturer supplying valves under these specifications shall have on file, at the City of Royse City, approved records of experience and detailed drawings of the proposed valves. Drawings shall cover the specific valve to be furnished for installation in the City of Royse City and shall show all dimensions including metal thickness, construction details and materials used in all parts of the valve together with ASTM Designation and structural properties of these materials.

The manufacturer shall furnish to the City, a Certification that the valve complies with the specifications without any exceptions. This certification shall apply to specific valve being installed with the City water distribution system. The certification shall state (1) the number of valves covered by the certification, (2) the Addition where valves are being installed or the Project Name and (3) name of Contractor installing valves.

The City may require the Manufacturer, Supplier or Contractor to dismantle valves at any time to determine compliance with these specifications. Location of any valve with the City system, installed after adoption of these specifications, that does not meet the specifications completely shall be cause for prohibiting the future use of any valves from the same manufacturer.

ITEM 504 OPEN CUT - BACKFILL

ITEM 504.2 MATERIALS

504.2.2.1 Add the following sentence:

All stone used for pipe embedment shall be standard crushed rock-aggregate, Grade 4, unless otherwise approved in writing.

ITEM 504.3 EXCAVATION AND FOUNDATION

Prior to start of excavation the Contractor shall remove and stockpile the Topsoil and protect the Topsoil from contamination during construction.

After the trench has been refilled, topsoil shall be replaced to the extent that rock, excavated from the trench, will be completely covered and the area is returned to its original condition, except that in cultivated areas a minimum of 12 inches of top soil shall be replaced.

ITEM 504.4 BACKFILL – GENERAL REQUIREMENTS

The material used in the backfill shall be pulverized to the extent necessary to produce, a free flowing material free of clay balls larger than 6-inch diameter.

ITEM 504.5 EMBEDMENT

ITEM 506 OPEN CUT – WATER CONDUIT INSTALLATION

506.3 Laying Water Conduit

Valves for installation in the City's distribution system shall be installed by direct burial as shown on the standard detail sheets and shall be provided with valve boxes for operation of the valve.

506.5 Hydrostatic Test:

All hydrostatic tests shall be maintained over a period of not less than four hours.

“Before being accepted, all ductile iron, C-900 PVC or concrete cylinder water mains shall be tested with a hydraulic test pressure of not less than four hours. Concrete pressure pipe shall be tested with a hydraulic test pressure of 120 percent of the design pressure. Steel pressure pipe shall be tested with a hydraulic test pressure not to exceed 150 percent and not less than 120 percent of the designed working pressure. The rate of leakage of all pipe tested shall not

exceed the amounts shown in the tables titled “Hydrostatic Test-C-900 PVC, Steel or Ductile Iron Water Mains” or “Hydrostatic Test-Concrete Cylinder Water Mains”. Water lines of material in combination shall be tested for the type of pipe (material) with the least stringent hydraulic test pressure and maintained over a period of not less than four hours.”

HYDROSTATIC TEST

C-900 OR 905 PVC, STEEL OR DUCTILE-IRON WATER MAINS

GALLONS ALLOWED									
L.F. Pipe	Pipe Diameter								
	4"	6"	8"	10"	12"	14"	16"	18"	20"
5	0.016	0.024	0.032	0.039	0.047	0.055	0.063	0.071	0.079
10	0.032	0.047	0.063	0.079	0.095	0.110	0.126	0.142	0.158
20	0.063	0.095	0.126	0.158	0.189	0.221	0.253	0.284	0.316'
30	0.095	0.142	0.189	0.237	0.284	0.331	0.379	0.426	0.473
40	0.126	0.189	0.253	0.316	0.379	0.442	0.505	0.568	0.631
50	0.158	0.239	0.316	0.395	0.473	0.552	0.631	0.710	0.789
60	0.189	0.284	0.379	0.473	0.568	0.663	0.758	0.852	0.947
70	0.221	0.331	0.442	0.552	0.663	0.773	0.884	0.994	1.105
80	0.253	0.379	0.505	0.631	0.756	0.884	1.010	1.136	1.263
90	0.284	0.426	0.568	0.710	0.852	0.994	1.136	1.278	1.420
100	0.316	0.473	0.631	0.789	0.947	1.105	1.263	1.420	1.578
200	0.631	0.947	1.263	1.578	1.894	2.210	2.525	2.841	3.157
300	0.947	1.420	1.894	2.367	2.841	3.314	3.788	4.261	4.735
400	1.263	1.894	2.525	3.157	3.788	4.419	5.051'	5.682	6.313
500	1.578	2.367	3.157	3.946	4.735	5.524	6.313	7.102	7.891
600	1.894	2.841	3.788	4.735	5.682	6.629	7.576	8.523	9.470
700	2.210	3.314	4.419	5.524	6.629	7.734	8.838	9.943	11.048
800	2.525	3.788	5.051	6.313	7.576	8.838	10.101	11.364	12.626
900	2.841	4.261	5.682	7.102	8.523	9.943	11.364	12.784	14.205
1000	3.157	4.735	6.313	7.891	9.470	11.048	12.626	14.205	15.783

Maximum allowable water loss in 4 hours at 180 pounds per square inch of pressure for a rate of 25. gallons per inch diameter of pipe per mile over a 24-hour period

EQUATION THE ABOVE CHART IS BASED ON:

$$\text{Maximum Loss (Gal.)} = 25 \times \text{Diameter of Pipe in Inches} \times \frac{\text{L.F. of Pipe}}{5280} \times \frac{4}{24}$$

HYDROSTATIC TEST
CONCRETE CYLINDER WATER MAINS

L.F. Pipe	GALLONS ALLOWED								
	Pipe Diameter								
	4"	6"	8"	10"	12"	14"	16"	18"	20"
5	0.031	0.047	0.063	0.078	0.095	0.110	0.126	0.142	0.158
10	0.063	0.095	0.126	0.158	0.189	0.221	0.253	0.284	0.315
20	0.126	0.189	0.253	0.316	0.379	0.442	0.505	0.568	0.631
30	0.188	0.284	0.379	0.473	0.568	0.663	0.758	0.852	0.947
40	0.253	0.379	0.505	0.631	0.758	0.884	1.010	1.136	1.263
50	0.316	0.473	0.631	0.789	0.947	1.105	1.263	1.420	1.578
60	0.379	0.568	0.758	0.947	1.136	1.326	1.515	1.704	1.894
70	0.442	0.663	0.884	1.105	1.326	1.547	1.768	1.989	2.210
80	0.505	0.758	1.010	1.263	1.515	1.768	2.020	2.273	2.525
90	0.568	0.852	1.136	1.420	1.704	1.989	2.273	2.557	2.841
100	0.631	0.947	1.263	1.578	1.894	2.209	2.525	2.841	3.156
200	1.263	1.894	2.525	3.156	3.788	4.419	5.050	5.682	6.313
300	1.894	2.841	3.788	4.735	5.682	6.628	7.575	8.522	9.470
400	2.525	3.788	5.050	6.313	7.575	8.838	10.100	11.363	12.626
500	3.158	4.735	6.313	7.891	9.470	11.047	12.626	14.204	15.782
600	3.788	5.682	7.575	9.469	11.363	13.257	15.151	17.045	18.938
700	4.419	6.628	8.838	11.047	13.257	15.468	17.676	19.885	22.095
800	5.050	7.575	10.100	12.626	15.152	17.676	20.201	22.726	25.251
900	5.682	8.522	11.363	14.204	17.044	19.886	22.726	25.567	28.405
1000	6.313	9.469	12.626	15.782	18.939	22.096	25.253	28.408	31.564

Maximum allowable water loss in 4 hours at 180 pounds per square inch of pressure for a rate of 50 gallons per inch diameter of pipe per mile over a 24-hour period

EQUATION THE ABOVE CHART IS BASED ON:

$$\text{Maximum Loss (Gal.)} = 50 \times \text{Diameter of Pipe in Inches} \times \frac{\text{L.F. of Pipe}}{5280} \times \frac{4}{24}$$

ITEM 506.7 Purging and Disinfection of Water Conduits (Add the following)

On all waterlines installed in the City of Royse City the Contractor shall be responsible for Purging, Testing and Sterilization of the completed lines.

DIVISION 600 – CONDUIT AND APPURTENANCES REHABILITATION

DIVISION 700 – STRUCTURES

DIVISION 800 – MISCELLANEOUS CONSTRUCTION & MATERIALS

ITEM 801.3 RAILINGS

Reflectorized marking for guard rail and other traffic control used shall meet the requirements of 3M Scotchlite Brand Reflective Sheeting Grade, Series 2800, 3800 or 5800, or equal. The marking shall conform to U.S. Department of Transportation, Federal Highway Administration, STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS, 1979 FP-79, Type III A, Sections 633.36 and 718.01 and Federal Supply Service, General Services Administration, LS-300 C, SHEETING AND TAPE REFLECTIVE NON-EXPOSED LENS, Reflectivity 2, Class 4.

ITEM 801.5 WIRE FENCING

801.5.2.1 Wire Fencing Fabric: All chain link fencing shall be No. 9 gage copper bearing open-hearth steel wire.

801.5.2.2 Posts

801.5.2.2.1 Metal: All posts shall be heavily galvanized by the hot-dip process after fabrication and shall be fitted with watertight malleable iron caps. All posts shall be of the following size and shape:

Line Posts: “H” Section hot rolled weighing not less than 4.10 pounds per linear foot or 3-1/2-inch O.D. pipe weighing not less than 3.65 pounds per linear foot.

Terminal Posts: Three inch (3”) steel pipe weighing not less than 5.79 pounds per linear foot.

Gate Posts: Four inch (4”) O.D. steel pipe weighing not less than 9.11 pounds per linear foot.

801.5.2.3 Rails, Gates, Braces and Fittings: Shall be 1-5/8 inch steel pipe weighing not less than 2.27 pounds per linear foot.

ITEM 803.2 GABION STRUCTURES

803.2.2 Materials

Add the sentence: All wire used, including tie and connecting wire, shall be certified by Mill Test Reports showing compliance with specification requirements.

803.2.2.2 Stone

Add the following: Facing stone shall be hand selected, large stone and shall be selected for best appearance. Facing stone shall be an off-white color and prior to laying the stone, samples shall be delivered to the site and shall be approved by the Engineer for gradation and appearance.

ITEM 805 ELECTRICAL COMPONENTS AND CONDUIT

ITEM 805.3 MATERIAL (Add the following)

Pull Box. All pull boxes shall be Quazite precast polymer concrete, or approved equal. Boxes shall be approximately 17" x 30" x 30" and shall be furnished with a concrete cover.