

SECTION 02230 - AGGREGATE BASE

PART 1: GENERAL
1.01 DESCRIPTION
A. This Section specifies furnishing, placing, shaping and compacting aggregate base on previously constructed subgrades.
B. Related work specified elsewhere:
1. General and Supplementary Conditions of the Contract
2. Division 1 - As applicable
3. Section 01410 - Testing Laboratory Service
4. Section 02200 - Earthwork
5. Section 02510 - Asphaltic Concrete Pavement
6. Section 02511 - Portland Cement Concrete Pvmnt.
1.02 QUALITY ASSURANCE
The following Codes, Regulations, Reference Standards and Specifications apply to work included in this Section:
1. ASTM: C-131, D-1556, D-698, D-2217, D-2922, D-4318
2. Texas SDHPT: Test Methods: Tex-110-E, Tex-116-E
1.03 SUBMITTALS
Submit the following for approval in accordance with Section 01410 - Testing Laboratory Services, and the additional requirements as specified for each:
A. Samples. At least seven (7) calendar days in advance of desired date of approval, submit for testing two (2) 1 cubic foot samples of base material or certified test results of same, performed by an independent test laboratory certifying that the proposed material complies with the specifications.
B. Source Quality Control.
1. Not less than 10 calendar days prior to the beginning of work, inform the Contracting Officer of source of material to be used.
2. Once the material has been approved, do not change source of supply without authorization and then only after receiving approval of the new source material.
3. Do not construe approval as approval of the entire location, but as approval only insofar as the material continues to conform to specified requirements.
4. Maintain quality of material which will be sampled and tested as directed by the Contracting Officer.
5. The Contracting Officer has the right to reject material at the worksite by visual inspection, pending sampling and testing.
C. Documentation. Submit delivery tickets from each hauler and to the worksite which include, as a minimum the supplier, material and its composition and material weight.

PART 2: PRODUCTS
2.01 FLEXIBLE BASE
A. In accordance with item 249, Flexible Base (Delivered), of the Texas State Department of Highways and Public Transportation (Texas SDHPT).
B. Physical Requirements.
1. Type: Type A, crushed or broken aggregate
2. Gradation: Grade One
2.02 BINDER
Test the binder to ensure the following requirements are met:
A. Liquid Limit. Not to exceed 40 when tested in accordance with ASTM D-4318.
B. Plastic Limit. Determined in accordance with ASTM D-4318.
C. Plasticity Index. Minimum of 4 and maximum of 12, when calculated in accordance with ASTM D-4318.
D. Prepare samples for testing according to ASTM D-4318 and in accordance with the requirements of ASTM D-2217.
E. Materials retained on the No. 4 sieve shall have a percent wear of not more than 45 when tested according to ASTM C-131.
F. The material when tested under the Wet Ball for Determining the Disintegration of Flexible Base Materials, Tex-116-E, shall not develop more than 50 percent soil binder.
G. The material, when tested in accordance with Tex-110-E, shall meet the required gradation specifications.

PART 3: EXECUTION
3.01 EQUIPMENT
A. Use equipment of size and weight necessary to shape material as shown and to compact material to specified minimum density.
B. Provide sufficient equipment to achieve specified compaction at rate consistent with rate of placement of base material.
C. Obtain approval of equipment prior to use on the work.
D. Maintain equipment in first class operating condition while in operation.
3.02 PLACING MATERIAL
A. Subgrade Preparation. In accordance with Section 02220 - Earthwork.
B. Place material in its final location so as to provide uniformity of grading throughout work.
C. Place material in uniform layers so that each layer has compacted lift thickness of 6 inches maximum and 3 inches minimum, for the full width of the layer.
D. Where thickness is shown or specified as more than 6 inches, place material in two or more layers of equal thickness so that specified requirements are met.

3.03 COMPACTION
Moisture content and densities shall conform to Paragraph 3.04 of this Section for the following:
A. During placing and compacting, maintain moisture content and dry density within the allowable tolerances specified.
B. Compact each layer to required density before placing next layer.
C. Compact areas not accessible to rollers to required density by means of approved mechanical tampers.
D. Pudding or jetting is prohibited.
3.04 FIELD QUALITY CONTROL
A. Allowable Tolerances.
1. Construct base to the following tolerances:
a. Thickness of base: Plus zero or minus 3/8-inch.
b. Surface of base:
(1) Plus 1/8-inch or minus 3/8-inch of elevation shown.
(2) Deviation not more than 1/2-inch from steel straightedge as specified in Section 02511 - Concrete Pavement.
2. Maintain moisture content within two percentage points of optimum moisture content. The "Density Control" method of compaction shall be used in accordance with item 249, Flexible Base, TX. SDHPT.
3. Compact material under curbs and gutters, gutters, curbs and pavement to 95 percent of maximum density at or above optimum moisture content, in accordance with ASTM D-698.
4. Compact material under sidewalks to 95 percent of maximum density at or above optimum moisture content, in accordance with ASTM D-1556 or D-2922.
B. Tests.
1. Laboratory reference optimum moisture content and maximum density shall be determined in accordance with ASTM D-698. Field density shall be determined in accordance with ASTM D-1556 or D-2922.
2. Perform no less than three (3) tests for the first 100 cubic yards placed, and a minimum of one (1) additional test for every additional 100 cubic yards placed.
3.05 MAINTENANCE
A. Maintain base for pavement in specified conditions until succeeding pavement course is placed.
3.06 DEFICIENT BASES
A. Where directed, repair or replace with new material all pavement base that does not meet requirements.

PART 4: METHOD OF MEASUREMENT
MEASUREMENT
A. All work to be completed in this Section shall be included in the lump sum bid for the several bid items as indicated in the scope of this project.
PART 5: BASIS OF PAYMENT
PAYMENT
A. The work described in this Section will be paid for at the Contract unit price which price shall be full compensation for shaping and fine grading the roadbed; for securing and furnishing all materials, including all royalty and freight involved; for furnishing scales and labor involved in weighing the material when required; for loosening, blasting, excavation, screening, crushing and temporary stockpiling when required; for loading all materials; for all hauling and delivering on the road; for spreading, mixing, blading, dragging, shaping and finishing; and for all manipulation, materials, labor, tools and incidentals necessary to complete the work as specified in this Section and related other sections of the specifications and plans.
END OF SECTION 02230
SECTION 02400 - STORM DRAINAGE
PART 1: GENERAL
1.01 SCOPE
A. This section includes all work required to complete, as indicated by the Plans and Specifications, and furnish all supplementary items necessary for the proper installation of the site storm drainages.
B. Related information or Work specified elsewhere in the Project Manuals includes, but is not limited to, the following:
1. General and Supplementary Conditions of the Contract
2. Division 1 - As applicable
3. Section 01410 - Testing Laboratory Services
4. Section 02200 - Earthwork
5. Section 02221 - Excavation, Trenching, Embedment, and Backfilling for Utilities
6. Section 02514 - Concrete Construction for Structures
1.02 REQUIREMENTS, CODES
A. The following are minimum requirements and shall govern, except that all local, state, county, and/or federal codes and ordinances shall govern when their requirements are in excess thereof.
B. All materials and construction shall conform to the latest edition of the North Central Texas Council of Governments Standard Specifications for Public Works Construction, the Texas Department of Transportation Storm Drainage Requirements, and the City of Dallas requirements for public works construction, standard 251D.
1.03 SUBMITTALS
A. Manufacturer's product data shall be submitted by the Contractor to the Engineer for the following:
1. Castings
2. Embedment Material
3. Pipe and Fittings, each type
4. Precast Concrete Structures
5. Joint Material

SECTION 02510 - ASPHALTIC CONCRETE PAVEMENT

PART 1: GENERAL
1.01 SCOPE
A. Perform all Work and furnish all materials required for manufacturing and placing hot mix asphaltic concrete paving surface.
B. Related information or Work specified elsewhere in the Project Manuals includes, but is not limited to, the following:
1. General and Supplementary Conditions of the Contract
2. Division 1 - As applicable
3. Section 01410 - Testing Laboratory Services
4. Section 02200 - Earthwork
1.02 REFERENCES
A. The Asphalt Institute - Manual MS-4 - The Asphalt Handbook.
B. The Asphalt Institute - Manual MS-13 - Asphalt Surface Treatments and Asphalt Penetration Maccodam.
C. ASTM D-946 - Asphalt Cement for Use in Pavement Construction.
D. Standard Specifications for Construction of Highways, Streets, and Bridges for the Texas Department of Transportation, State of Texas (1982 or latest edition thereof).
E. North Central Texas Council of Governments Standard Specifications for Public Works Construction, latest edition.
1.03 QUALITY ASSURANCE
A. Perform work in accordance with current Texas Department of Transportation Specifications and the North Central Texas Council of Governments Standard Specifications for Public Works Construction, latest edition.
B. American Society for Testing and Materials.
C. Mixing Plant: Conform to current Texas Department of Transportation Specifications.
D. Obtain materials from same source throughout.
1.04 TESTS
A. Testing and analysis of asphaltic mix will be performed under provisions of Section 01410.
B. Submit proposed mix design for review prior to commencement of Work.
C. Testing organization will take samples and perform tests in accordance with ASTM methods.
1.05 SUBMITTALS
A. Submit product data under provisions of General Conditions.
B. Submit manufacturers' instructions under provisions of General Conditions.
1.06 ENVIRONMENTAL REQUIREMENTS
A. Do not place asphalt when base surface temperature is less than 50F and falling.
PART 2: PRODUCTS
2.01 MATERIALS
A. Prime Coat: MC-30 or MC-70 Asphalt.
B. Tack Coat: Grade SS-1 Emulsified Asphalt.
C. Asphalt Cement: ASTM D-946.
D. Aggregate for Surface Mix: ASTM C-131, C-136, D-423, D-424.
E. Fine Aggregate: ASTM C-131, C-136, D-423, D-424.
F. Mineral Filler: Finely ground particles of limestone, hydrated lime, or other approved mineral dust, free of foreign matter.
2.02 ASPHALT PAVING MIX
A. Use dry materials to avoid fouling. Mix uniformly.
B. Hot mix asphaltic concrete surface course should meet the requirements of Texas Department of Transportation Standard Specifications Item 340 - Hot Mix Asphaltic Concrete, Type "D".
PART 3: EXECUTION
3.01 INSPECTION
A. Prepared subgrade shall be tested in conformance with Section 01410 and approved by Soils Engineer.
B. Verify cement treated base is dry and ready to support paving and imposed loads.
C. Verify grades and elevations of base are correct.
D. Beginning of installation means acceptance of substrate.
3.02 PREPARATION
A. Apply prime coat over substrate at uniform rate of 0.20 gallons/square yard.
B. Apply primer in accordance with manufacturer's instructions.
C. Use clean sand to blot excess primer.
D. Apply primer to contact surfaces of curbs and foundations.
3.03 PLACING ASPHALT PAVEMENT
A. Place surface course within 24 hours of priming base surfaces.
B. Place each course to compacted thickness identified on the Plans.
C. Compact pavement by rolling. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
D. Develop rolling with consecutive passes to achieve even and smooth finish, without roller marks.
3.04 TOLERANCES
A. Flatness: Maximum variation of 1/4 inch measured with 10-foot straight edge.
B. Compacted Scheduled Thickness: Within 1/4 inch of design thickness.
C. Variation from True Elevation: Within 1/2 inch.

PART 2: PRODUCTS
2.01 MATERIALS
A. Bedding: See Section 02221 - Excavation, Trenching, Embedment, and Backfilling for Utilities
B. Backfill: See Section 02221 - Excavation, Trenching, Embedment, and Backfilling for Utilities
C. Storm sewer pipe twelve (12) inches in diameter and larger: Reinforced concrete pipe conforming to ASTM C-76, Class III or IV as shown on the Plans.
2.02 PIPE JOINT MATERIAL
A. For concrete pipe or box sections, furnish rubber gasket pipe joint material, such as Rom-Nek flexible plastic gasket as manufactured by the K. T. Snyder Company, Inc., or approved equal meeting all requirements of Federal Specification SS-5-00210, "Sealing Compound, Performed Plastic for Pipe Joints". Use a primer of the type recommended by the manufacturer of the compound used.
B. Joints in precast pipe sewers shall be formed in a careful, thorough, and workmanlike manner. All pipe shall be jointed tight and sealed with stiff mortar, composed of one part portland cement and two parts sand, so placed as to form a durable watertight joint. The ends of the pipe shall be cleaned thoroughly and wetted before making the joint.
2.03 INLET AND JUNCTION BOX MATERIAL
A. Grate inlet shall consist of a precast or cast-in-place box with a grate cover and frame as specified on the Plans.
B. All frames and covers for inlets shall be non-rocking and heavy duty.
C. Finish mortar conforming to ASTM C-270 Mortar Type M using Portland Cement. Use aggregate conforming to ASTM C-144.
PART 3: EXECUTION
3.01 GENERAL
A. Material storage, sequence, construction signing or barricades, any required permitting, & cleanup shall be the sole responsibility of the Contractor. All layouts and grades shall be as shown on the Plans. Immediately notify the Engineer of any discrepancies or conflicts in the Plans prior to proceeding with the Work.
3.02 EXCAVATION, BEDDING, AND BACKFILL
A. All excavation, bedding, and backfill shall conform to Section 02221, the Plans, and the North Central Texas Council of Governments Standard Specifications for Public Works Construction, latest edition.
3.03 PIPE INSTALLATION
A. Furnish and place in position, as directed, all necessary stakes, grade and batter boards for locating work. Do not place pipe until the excavation has been completed, the bottom of the trench condition, line and grade has been obtained. Lay pipe accurately to line and grade in a straight line with spigot or tongue end of pipe pointing in the direction of flow. Fit pipe sections together and match them so that when laid, the pipe will form a sewer or culvert with a smooth and uniform invert.
3.04 CONCRETE PIPE OR BOX JOINT INSTALLATION
A. Cold compound joints:
1. Neoprene or Rubber Gasket Joints: Rubber gaskets meeting ASTM C 443 may be used in joining concrete pipe. Ends of the pipe must be accurately made and designed for use in gaskets. Lay the pipe sections in the trench to true alignment and grade. Take care in placing pipe and making field joints. Properly lubricate the groove end of the pipe and rubber gasket with oil or grease. The gasketing will not be permitted. Stretch a gasket over the spigot end of the pipe and carefully seat the gasket in the groove. Do not twist, roll, cut, crimp, or otherwise injure gaskets or force them into position during closure of the joint. Joints in pipe twelve (12) inches and over may be pulled home by suitable winch, come-along or jack, three (3) tons minimum capacity. Correct joint rebound before backfilling pipe. Pull or push home pipe smaller than twelve (12) inches in diameter by suitable means. Remove foreign matter or dirt from the pipe and keep the pipe clean during and after laying.
B. Positioning: Joints made with cold compound may be pulled home by means of a suitable winch or other suitable power equipment or a come-along. Do not use a bar stuck into the ground for positioning joints on pipe larger than ten (10) inches. A bar may be used to push home the joints in pipe ten (10) inches and smaller, provided the joints are pushed all the way home. Positioning will be checked by measuring the laid length per joint so that the number of joints multiplied by the laying length per joint must equal the actual length of sewer in any given section. Pull pipe home in a straight line with all parts of the pipe during or after the pulling operation. Pull or push home rubber gasket joints by any suitable means that will provide adequate pressure to ensure proper assembly of the joint. Use special care to ensure that the joints are pushed home and remain in that position. Complete the joints in accordance with the published instructions of the manufacturer. Neoprene or rubber gasket joints shall, unless otherwise specified, be pointed on the outside with cement mortar.
3.05 GRATE INLET INSTALLATION
A. Construct or install all inlets to line and grade at locations shown or as established by the Engineer. Construct the box section of the inlets per the Plans and Section 02514. Neatly cut off all inlet ends at the inside face of the inlet wall and point up with mortar. Shape the floor of all inlets by filling with mortar to facilitate drainage and prevent siltation.
END OF SECTION 02400

PART 1: GENERAL
1.01 SCOPE
A. Perform all work required for pavement marking as indicated on the plans and specified herein.
B. Related information or work specified elsewhere in the Project Manuals includes, but is not limited to, the following:
1. General and Supplementary Conditions of the Contract
2. Division 1 - As applicable
3. Section 02511 - Portland Cement Concrete Pavement
4. Section 02525 - Concrete Curbs
C. Pavement marking and other painting to be done under this specifications includes:
1. All parking space marking, directional arrows, curbs, entrance arrows, fire lane lines, accessibility parking symbol on pavement, diagonal safety marking required of accessible parking spaces and any other marking or painting required by codes, ordinances or laws in conjunction with traffic movement or control and parking on the site.
1.02 REQUIREMENTS, CODES
A. The following specifications are minimum requirements and shall govern, except that all local, state, county and/or federal, codes and ordinances shall govern when their requirements exceed those specified herein.
B. Contractor shall coordinate fire lane requirements with City of Dallas Fire Department.
1.03 SUBMITTALS
A. Submit complete manufacturer's product data sheets for marking paint.
1.04 JOB CONDITIONS
A. Environmental requirements. Do not apply materials in rainy or foggy conditions, or when ambient or pavement temperatures are below 50°F, or when such conditions are anticipated in subsequent 8 hours.
PART 2: PRODUCTS
2.01 PAINT
A. Paint for all fire lane striping shall be a weather resistant traffic paint, bright red, as manufactured by Sherwin-Williams or Glidden.
B. Paint for letters along fire lane striping and all other points shall be a weather resistant traffic paint, white, as manufactured by Sherwin-Williams or Glidden.
PART 3: EXECUTION
3.01 PREPARATION
A. Inspect all surfaces to be painted. Contractor shall repair all surface damage and defects.
B. Clean surface of all foreign material.
3.02 APPLICATION
A. Apply one coat, 9 mil. thickness on face and top of curbs at all drive approaches, and as required to form all directional arrows on site.
B. Apply one coat, 9 mil. thickness in four (4)-inch-wide stripes at the spacing and angles as shown on the plans to create parking stalls, handicap symbols, all safety markings as required by the Americans with Disabilities Act of 1990, and any other striping or symbols required by city, county, state, and/or federal codes, ordinances, or laws.
C. If one coat does not provide acceptable coverage, recoat until acceptable coverage is attained.
3.03 PROTECTION
A. Protect adjacent surfaces from overspray or splatter.
END OF SECTION 02584

SECTION 02510 - ASPHALTIC CONCRETE PAVEMENT

PART 1: GENERAL
1.01 SCOPE
A. Perform all Work and furnish all materials required for manufacturing and placing hot mix asphaltic concrete paving surface.
B. Related information or Work specified elsewhere in the Project Manuals includes, but is not limited to, the following:
1. General and Supplementary Conditions of the Contract
2. Division 1 - As applicable
3. Section 01410 - Testing Laboratory Services
4. Section 02200 - Earthwork
1.02 REFERENCES
A. The Asphalt Institute - Manual MS-4 - The Asphalt Handbook.
B. The Asphalt Institute - Manual MS-13 - Asphalt Surface Treatments and Asphalt Penetration Maccodam.
C. ASTM D-946 - Asphalt Cement for Use in Pavement Construction.
D. Standard Specifications for Construction of Highways, Streets, and Bridges for the Texas Department of Transportation, State of Texas (1982 or latest edition thereof).
E. North Central Texas Council of Governments Standard Specifications for Public Works Construction, latest edition.
1.03 QUALITY ASSURANCE
A. Perform work in accordance with current Texas Department of Transportation Specifications and the North Central Texas Council of Governments Standard Specifications for Public Works Construction, latest edition.
B. American Society for Testing and Materials.
C. Mixing Plant: Conform to current Texas Department of Transportation Specifications.
D. Obtain materials from same source throughout.
1.04 TESTS
A. Testing and analysis of asphaltic mix will be performed under provisions of Section 01410.
B. Submit proposed mix design for review prior to commencement of Work.
C. Testing organization will take samples and perform tests in accordance with ASTM methods.
1.05 SUBMITTALS
A. Submit product data under provisions of General Conditions.
B. Submit manufacturers' instructions under provisions of General Conditions.
1.06 ENVIRONMENTAL REQUIREMENTS
A. Do not place asphalt when base surface temperature is less than 50F and falling.
PART 2: PRODUCTS
2.01 MATERIALS
A. Prime Coat: MC-30 or MC-70 Asphalt.
B. Tack Coat: Grade SS-1 Emulsified Asphalt.
C. Asphalt Cement: ASTM D-946.
D. Aggregate for Surface Mix: ASTM C-131, C-136, D-423, D-424.
E. Fine Aggregate: ASTM C-131, C-136, D-423, D-424.
F. Mineral Filler: Finely ground particles of limestone, hydrated lime, or other approved mineral dust, free of foreign matter.
2.02 ASPHALT PAVING MIX
A. Use dry materials to avoid fouling. Mix uniformly.
B. Hot mix asphaltic concrete surface course should meet the requirements of Texas Department of Transportation Standard Specifications Item 340 - Hot Mix Asphaltic Concrete, Type "D".
PART 3: EXECUTION
3.01 INSPECTION
A. Prepared subgrade shall be tested in conformance with Section 01410 and approved by Soils Engineer.
B. Verify cement treated base is dry and ready to support paving and imposed loads.
C. Verify grades and elevations of base are correct.
D. Beginning of installation means acceptance of substrate.
3.02 PREPARATION
A. Apply prime coat over substrate at uniform rate of 0.20 gallons/square yard.
B. Apply primer in accordance with manufacturer's instructions.
C. Use clean sand to blot excess primer.
D. Apply primer to contact surfaces of curbs and foundations.
3.03 PLACING ASPHALT PAVEMENT
A. Place surface course within 24 hours of priming base surfaces.
B. Place each course to compacted thickness identified on the Plans.
C. Compact pavement by rolling. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
D. Develop rolling with consecutive passes to achieve even and smooth finish, without roller marks.
3.04 TOLERANCES
A. Flatness: Maximum variation of 1/4 inch measured with 10-foot straight edge.
B. Compacted Scheduled Thickness: Within 1/4 inch of design thickness.
C. Variation from True Elevation: Within 1/2 inch.

PART 2: PRODUCTS
2.01 MATERIALS
A. Bedding: See Section 02221 - Excavation, Trenching, Embedment, and Backfilling for Utilities
B. Backfill: See Section 02221 - Excavation, Trenching, Embedment, and Backfilling for Utilities
C. Storm sewer pipe twelve (12) inches in diameter and larger: Reinforced concrete pipe conforming to ASTM C-76, Class III or IV as shown on the Plans.
2.02 PIPE JOINT MATERIAL
A. For concrete pipe or box sections, furnish rubber gasket pipe joint material, such as Rom-Nek flexible plastic gasket as manufactured by the K. T. Snyder Company, Inc., or approved equal meeting all requirements of Federal Specification SS-5-00210, "Sealing Compound, Performed Plastic for Pipe Joints". Use a primer of the type recommended by the manufacturer of the compound used.
B. Joints in precast pipe sewers shall be formed in a careful, thorough, and workmanlike manner. All pipe shall be jointed tight and sealed with stiff mortar, composed of one part portland cement and two parts sand, so placed as to form a durable watertight joint. The ends of the pipe shall be cleaned thoroughly and wetted before making the joint.
2.03 INLET AND JUNCTION BOX MATERIAL
A. Grate inlet shall consist of a precast or cast-in-place box with a grate cover and frame as specified on the Plans.
B. All frames and covers for inlets shall be non-rocking and heavy duty.
C. Finish mortar conforming to ASTM C-270 Mortar Type M using Portland Cement. Use aggregate conforming to ASTM C-144.
PART 3: EXECUTION
3.01 GENERAL
A. Material storage, sequence, construction signing or barricades, any required permitting, & cleanup shall be the sole responsibility of the Contractor. All layouts and grades shall be as shown on the Plans. Immediately notify the Engineer of any discrepancies or conflicts in the Plans prior to proceeding with the Work.
3.02 EXCAVATION, BEDDING, AND BACKFILL
A. All excavation, bedding, and backfill shall conform to Section 02221, the Plans, and the North Central Texas Council of Governments Standard Specifications for Public Works Construction, latest edition.
3.03 PIPE INSTALLATION
A. Furnish and place in position, as directed, all necessary stakes, grade and batter boards for locating work. Do not place pipe until the excavation has been completed, the bottom of the trench condition, line and grade has been obtained. Lay pipe accurately to line and grade in a straight line with spigot or tongue end of pipe pointing in the direction of flow. Fit pipe sections together and match them so that when laid, the pipe will form a sewer or culvert with a smooth and uniform invert.
3.04 CONCRETE PIPE OR BOX JOINT INSTALLATION
A. Cold compound joints:
1. Neoprene or Rubber Gasket Joints: Rubber gaskets meeting ASTM C 443 may be used in joining concrete pipe. Ends of the pipe must be accurately made and designed for use in gaskets. Lay the pipe sections in the trench to true alignment and grade. Take care in placing pipe and making field joints. Properly lubricate the groove end of the pipe and rubber gasket with oil or grease. The gasketing will not be permitted. Stretch a gasket over the spigot end of the pipe and carefully seat the gasket in the groove. Do not twist, roll, cut, crimp, or otherwise injure gaskets or force them into position during closure of the joint. Joints in pipe twelve (12) inches and over may be pulled home by suitable winch, come-along or jack, three (3) tons minimum capacity. Correct joint rebound before backfilling pipe. Pull or push home pipe smaller than twelve (12) inches in diameter by suitable means. Remove foreign matter or dirt from the pipe and keep the pipe clean during and after laying.
B. Positioning: Joints made with cold compound may be pulled home by means of a suitable winch or other suitable power equipment or a come-along. Do not use a bar stuck into the ground for positioning joints on pipe larger than ten (10) inches. A bar may be used to push home the joints in pipe ten (10) inches and smaller, provided the joints are pushed all the way home. Positioning will be checked by measuring the laid length per joint so that the number of joints multiplied by the laying length per joint must equal the actual length of sewer in any given section. Pull pipe home in a straight line with all parts of the pipe during or after the pulling operation. Pull or push home rubber gasket joints by any suitable means that will provide adequate pressure to ensure proper assembly of the joint. Use special care to ensure that the joints are pushed home and remain in that position. Complete the joints in accordance with the published instructions of the manufacturer. Neoprene or rubber gasket joints shall, unless otherwise specified, be pointed on the outside with cement mortar.
3.05 GRATE INLET INSTALLATION
A. Construct or install all inlets to line and grade at locations shown or as established by the Engineer. Construct the box section of the inlets per the Plans and Section 02514. Neatly cut off all inlet ends at the inside face of the inlet wall and point up with mortar. Shape the floor of all inlets by filling with mortar to facilitate drainage and prevent siltation.
END OF SECTION 02400

PART 1: GENERAL
1.01 SCOPE
A. Perform all work required for pavement marking as indicated on the plans and specified herein.
B. Related information or work specified elsewhere in the Project Manuals includes, but is not limited to, the following:
1. General and Supplementary Conditions of the Contract
2. Division 1 - As applicable
3. Section 02511 - Portland Cement Concrete Pavement
4. Section 02525 - Concrete Curbs
C. Pavement marking and other painting to be done under this specifications includes:
1. All parking space marking, directional arrows, curbs, entrance arrows, fire lane lines, accessibility parking symbol on pavement, diagonal safety marking required of accessible parking spaces and any other marking or painting required by codes, ordinances or laws in conjunction with traffic movement or control and parking on the site.
1.02 REQUIREMENTS, CODES
A. The following specifications are minimum requirements and shall govern, except that all local, state, county and/or federal, codes and ordinances shall govern when their requirements exceed those specified herein.
B. Contractor shall coordinate fire lane requirements with City of Dallas Fire Department.
1.03 SUBMITTALS
A. Submit complete manufacturer's product data sheets for marking paint.
1.04 JOB CONDITIONS
A. Environmental requirements. Do not apply materials in rainy or foggy conditions, or when ambient or pavement temperatures are below 50°F, or when such conditions are anticipated in subsequent 8 hours.
PART 2: PRODUCTS
2.01 PAINT
A. Paint for all fire lane striping shall be a weather resistant traffic paint, bright red, as manufactured by Sherwin-Williams or Glidden.
B. Paint for letters along fire lane striping and all other points shall be a weather resistant traffic paint, white, as manufactured by Sherwin-Williams or Glidden.
PART 3: EXECUTION
3.01 PREPARATION
A. Inspect all surfaces to be painted. Contractor shall repair all surface damage and defects.
B. Clean surface of all foreign material.
3.02 APPLICATION
A. Apply one coat, 9 mil. thickness on face and top of curbs at all drive approaches, and as required to form all directional arrows on site.
B. Apply one coat, 9 mil. thickness in four (4)-inch-wide stripes at the spacing and angles as shown on the plans to create parking stalls, handicap symbols, all safety markings as required by the Americans with Disabilities Act of 1990, and any other striping or symbols required by city, county, state, and/or federal codes, ordinances, or laws.
C. If one coat does not provide acceptable coverage, recoat until acceptable coverage is attained.
3.03 PROTECTION
A. Protect adjacent surfaces from overspray or splatter.
END OF SECTION 02584

SECTION 02510 - ASPHALTIC CONCRETE PAVEMENT

3.05 FIELD QUALITY CONTROL
A. Field inspection and testing will be performed under provisions of Section 01410.
3.06 PROTECTION
A. Immediately after placement, protect pavement from mechanical injury for six (6) hours.
3.07 SCHEDULE
A. The surface course noted below shall apply for each specific thickness as noted on the Plans.
Type "D"
Passing 1/2" sieve 100
Passing 3/8" sieve 85 to 100
Passing 3/8" sieve, retained on No. 4 sieve 21 to 53
Passing No. 4 sieve, retained on No. 10 sieve 11 to 32
Total retained on No. 10 sieve 54 to 74
Passing No. 10 sieve, retained on No. 40 sieve 6 to 32
Passing No. 40 sieve, retained on No. 80 sieve 4 to 27
Passing No. 80 sieve, retained on No. 200 sieve 3 to 27
Passing No. 200 sieve 1 to 8
The asphaltic material shall form from 4 to 8 percent of the mixture by weight or from 9 to 19 percent of the mixture by volume, unless specified otherwise on the Plans.
END OF SECTION 02510
SECTION 02511 - PORTLAND CEMENT CONCRETE PAVEMENT
(SEE SHEET S702 FOR THIS SECTION)
SECTION 02514 - CONCRETE CONSTRUCTION FOR STRUCTURES
PART 1: GENERAL
1.01 SCOPE
A. Section includes all materials and work required to complete, as indicated by the Plans and Specifications, and furnish all supplementary items necessary for the proper installation of Concrete Construction for Structures.
B. Related information or work specified elsewhere in the Project Manuals includes, but is not limited to, the following:
1. General and Supplementary Conditions of the Contract
2. Division 1 - As applicable
3. Section 01410 - Testing Laboratory Services
4. Section 02200 - Earthwork
5. Section 02400 - Storm Drainage
1.02 REQUIREMENTS AND CODES
A. The following Specifications are minimum requirements and shall govern, except that all federal, local, county, and/or state codes and ordinances shall govern when their requirements exceed those specified herein.
B. Comply with all requirements of the North Central Texas Council of Governments Standard Specifications for Public Works Construction latest edition.
PART 2: PRODUCTS
2.01 MATERIALS
A. Use Portland Cement conforming to ASTM C-150, Type I unless authorized to use Type II. Meet ASTM Specifications for weight variations and length of storage. Use no soaked cement. Deliver in bags for site-mixed concrete. Use only one brand of cement in any one structure.
B. Furnish clean water, free from harmful amounts of oils, acids, alkalis or other damaging substances, in accordance with ACI and ASTM requirements.
C. Provide coarse aggregate conforming to ASTM C-33. Unless otherwise specified, use standard size from No. 4 to 1-1/2 inch and modify only in accordance with the following. Supply aggregate not larger than 1/5 of the narrowest dimension between sides of forms, nor larger than 3/4 of minimum clear spacing between reinforcing bars.
D. Provide fine aggregate meeting the requirement of ASTM C-33.
E. Use an air entraining admixture conforming with ASTM C-260.
F. Use new billet steel bars, Grade 60, conforming to ASTM A-615. Provide bars manufactured by the open hearth process. When placed in work, steel must be free from dirt, scale, rust, oil, or other harmful materials. Where shown, use welded wire fabric conforming to ASTM A-82. Supply the gauge and spacing shown, with longitudinal and transverse wires electrically welded together at points of intersection, using welds strong enough not to be broken during handling or placing. Weld and fabricate fabric sheets according to ASTM A-185. Submit manufacturer's certificates giving properties of steel and supply specimens, free of cost, for testing when required.
G. For curing concrete, provide liquid membrane forming compounds. Use a Type 2, white pigmented compound conforming to ASTM C-309.
H. Nonshrinking grout shall be nonmetallic, nonstaining type conforming to CRD-C-621-BA and ASTM C-827.
I. Expansion joints shall be one-half (1/2) inch thick cast-in-place concrete with expansion joints, conforming to ASTM D-1751 with removable plastic cap leaving one-half (1/2) inch deep for sealant.
J. Control joint shall be rigid plastic joint forms, minimum one-eighth (1/8) inch thick, two (2) inches deep, with arrow shaped lip and removable top as manufactured by Burke (Zip Strip) or approved equal. Sawcut control joints can be used in lieu of plastic joint.

PART 2: PRODUCTS
2.01 MATERIALS
A. Bedding: See Section 02221 - Excavation, Trenching, Embedment, and Backfilling for Utilities
B. Backfill: See Section 02221 - Excavation, Trenching, Embedment, and Backfilling for Utilities
C. Storm sewer pipe twelve (12) inches in diameter and larger: Reinforced concrete pipe conforming to ASTM C-76, Class III or IV as shown on the Plans.
2.02 PIPE JOINT MATERIAL
A. For concrete pipe or box sections, furnish rubber gasket pipe joint material, such as Rom-Nek flexible plastic gasket as manufactured by the K. T. Snyder Company, Inc., or approved equal meeting all requirements of Federal Specification SS-5-00210, "Sealing Compound, Performed Plastic for Pipe Joints". Use a primer of the type recommended by the manufacturer of the compound used.
B. Joints in precast pipe sewers shall be formed in a careful, thorough, and workmanlike manner. All pipe shall be jointed tight and sealed with stiff mortar, composed of one part portland cement and two parts sand, so placed as to form a durable watertight joint. The ends of the pipe shall be cleaned thoroughly and wetted before making the joint.
2.03 INLET AND JUNCTION BOX MATERIAL
A. Grate inlet shall consist of a precast or cast-in-place box with a grate cover and frame as specified on the Plans.
B. All frames and covers for inlets shall be non-rocking and heavy duty.
C. Finish mortar conforming to ASTM C-270 Mortar Type M using Portland Cement. Use aggregate conforming to ASTM C-144.
PART 3: EXECUTION
3.01 GENERAL
A. Material storage, sequence, construction signing or barricades, any required permitting, & cleanup shall be the sole responsibility of the Contractor. All layouts and grades shall be as shown on the Plans. Immediately notify the Engineer of any discrepancies or conflicts in the Plans prior to proceeding with the Work.
3.02 EXCAVATION, BEDDING, AND BACKFILL
A. All excavation, bedding, and backfill shall conform to Section 02221, the Plans, and the North Central Texas Council of Governments Standard Specifications for Public Works Construction, latest edition.
3.03 PIPE INSTALLATION
A. Furnish and place in position, as directed, all necessary stakes, grade and batter boards for locating work. Do not place pipe until the excavation has been completed, the bottom of the trench condition, line and grade has been obtained. Lay pipe accurately to line and grade in a straight line with spigot or tongue end of pipe pointing in the direction of flow. Fit pipe sections together and match them so that when laid, the pipe will form a sewer or culvert with a smooth and uniform invert.
3.04 CONCRETE PIPE OR BOX JOINT INSTALLATION
A. Cold compound joints:
1. Neoprene or Rubber Gasket Joints: Rubber gaskets meeting ASTM C 443 may be used in joining concrete pipe. Ends of the pipe must be accurately made and designed for use in gaskets. Lay the pipe sections in the trench to true alignment and grade. Take care in placing pipe and making field joints. Properly lubricate the groove end of the pipe and rubber gasket with oil or grease. The gasketing will not be permitted. Stretch a gasket over the spigot end of the pipe and carefully seat the gasket in the groove. Do not twist, roll, cut, crimp, or otherwise injure gaskets or force them into position during closure of the joint. Joints in pipe twelve (12) inches and over may be pulled home by suitable winch, come-along or jack, three (3) tons minimum capacity. Correct joint rebound before backfilling pipe. Pull or push home pipe smaller than twelve (12) inches in diameter by suitable means. Remove foreign matter or dirt from the pipe and keep the pipe clean during and after laying.
B. Positioning: Joints made with cold compound may be pulled home by means of a suitable winch or other suitable power equipment or a come-along. Do not use a bar stuck into the ground for positioning joints on pipe larger than ten (10) inches. A bar may be used to push home the joints in pipe ten (10) inches and smaller, provided the joints are pushed all the way home. Positioning will be checked by measuring the laid length per joint so that the number of joints multiplied by the laying length per joint must equal the actual length of sewer in any given section. Pull pipe home in a straight line with all parts of the pipe during or after the pulling operation. Pull or push home rubber gasket joints by any suitable means that will provide adequate pressure to ensure proper assembly of the joint. Use special care to ensure that the joints are pushed home and remain in that position. Complete the joints in accordance with the published instructions of the manufacturer. Neoprene or rubber gasket joints shall, unless otherwise specified, be pointed on the outside with cement mortar.
3.05 GRATE INLET INSTALLATION
A. Construct or install all inlets to line and grade at locations shown or as established by the Engineer. Construct the box section of the inlets per the Plans and Section 02514. Neatly cut off all inlet ends at the inside face of the inlet wall and point up with mortar. Shape the floor of all inlets by filling with mortar to facilitate drainage and prevent siltation.
END OF SECTION 02400

PART 1: GENERAL
1.01 SCOPE
A. Perform all work required for pavement marking as indicated on the plans and specified herein.
B. Related information or work specified elsewhere in the Project Manuals includes, but is not limited to, the following:
1. General and Supplementary Conditions of the Contract
2. Division 1 - As applicable
3. Section 02511 - Portland Cement Concrete Pavement
4. Section 02525 - Concrete Curbs
C. Pavement marking and other painting to be done under this specifications includes:
1. All parking space marking, directional arrows, curbs, entrance arrows, fire lane lines, accessibility parking symbol on pavement, diagonal safety marking required of accessible parking spaces and any other marking or painting required by codes, ordinances or laws in conjunction with traffic movement or control and parking on the site.
1.02 REQUIREMENTS, CODES
A. The following specifications are minimum requirements and shall govern, except that all local, state, county and/or federal, codes and ordinances shall govern when their requirements exceed those specified herein.
B. Contractor shall coordinate fire lane requirements with City of Dallas Fire Department.
1.03 SUBMITTALS
A. Submit complete manufacturer's product data sheets for marking paint.
1.04 JOB CONDITIONS
A. Environmental requirements. Do not apply materials in rainy or foggy conditions, or when ambient or pavement temperatures are below 50°F, or when such conditions are anticipated in subsequent 8 hours.
PART 2: PRODUCTS
2.01 PAINT
A. Paint for all fire lane striping shall be a weather resistant traffic paint, bright red, as manufactured by Sherwin-Williams or Glidden.
B. Paint for letters along fire lane striping and all other points shall be a weather resistant traffic paint, white, as manufactured by Sherwin-Williams or Glidden.
PART 3: EXECUTION
3.01 PREPARATION
A. Inspect all surfaces to be painted. Contractor shall repair all surface damage and defects.
B. Clean surface of all foreign material.
3.02 APPLICATION
A. Apply one coat, 9 mil. thickness on face and top of curbs at all drive approaches, and as required to form all directional arrows on site.
B. Apply one coat, 9 mil. thickness in four (4)-inch-wide stripes at the spacing and angles as shown on the plans to create parking stalls, handicap symbols, all safety markings as required by the Americans with Disabilities Act of 1990, and any other striping or symbols required by city, county, state, and/or federal codes, ordinances, or laws.
C. If one coat does not provide acceptable coverage, recoat until acceptable coverage is attained.
3.03 PROTECTION
A. Protect adjacent surfaces from overspray or splatter.
END OF SECTION 02584

SECTION 02584 - PAVEMENT MARKING

PART 1: GENERAL
1.01 SCOPE
A. Perform all work required for pavement marking as indicated on the plans and specified herein.
B. Related information or work specified elsewhere in the Project Manuals includes, but is not limited to, the following:
1. General and Supplementary Conditions of the Contract
2. Division 1 - As applicable
3. Section 02511 - Portland Cement Concrete Pavement
4. Section 02525 - Concrete Curbs
C. Pavement marking and other painting to be done under this specifications includes:
1. All parking space marking, directional arrows, curbs, entrance arrows, fire lane lines, accessibility parking symbol on pavement, diagonal safety marking required of accessible parking spaces and any other marking or painting required by codes, ordinances or laws in conjunction with traffic movement or control and parking on the site.
1.02 REQUIREMENTS, CODES
A. The following specifications are minimum requirements and shall govern, except that all local, state, county and/or federal, codes and ordinances shall govern when their requirements exceed those specified herein.
B. Contractor shall coordinate fire lane requirements with City of Dallas Fire Department.
1.03 SUBMITTALS
A. Submit complete manufacturer's product data sheets for marking paint.
1.04 JOB CONDITIONS
A. Environmental requirements. Do not apply materials in rainy or foggy conditions, or when ambient or pavement temperatures are below 50°F, or when such conditions are anticipated in subsequent 8 hours.
PART 2: PRODUCTS
2.01 PAINT
A. Paint for all fire lane striping shall be a weather resistant traffic paint, bright red, as manufactured by Sherwin-Williams or Glidden.
B. Paint for letters along fire lane striping and all other points shall be a weather resistant traffic paint, white, as manufactured by Sherwin-Williams or Glidden.
PART 3: EXECUTION
3.01 PREPARATION
A. Inspect all surfaces to be painted. Contractor shall repair all surface damage and defects.
B. Clean surface of all foreign material.
3.02 APPLICATION
A. Apply one coat, 9 mil. thickness on face and top of curbs at all drive approaches, and as required to form all directional arrows on site.
B. Apply one coat, 9 mil. thickness in four (4)-inch-wide stripes at the spacing and angles as shown on the plans to create parking stalls, handicap symbols, all safety markings as required by the Americans with Disabilities Act of 1990, and any other striping or symbols required by city, county, state, and/or federal codes, ordinances, or laws.
C. If one coat does not provide acceptable coverage, recoat until acceptable coverage is attained.
3.03 PROTECTION
A. Protect adjacent surfaces from overspray or splatter.
END OF SECTION 02584

3.05 FIELD QUALITY CONTROL
A. Field inspection and testing will be performed under provisions of Section 01410.
3.06 PROTECTION
A. Immediately after placement, protect pavement from mechanical injury for six (6) hours.
3.07 SCHEDULE
A. The surface course noted below shall apply for each specific thickness as noted on the Plans.
Type "D"
Passing 1/2" sieve 100
Passing 3/8" sieve 85 to 100
Passing 3/8" sieve, retained on No. 4 sieve 21 to 53
Passing No. 4 sieve, retained on No. 10 sieve 11 to 32
Total retained on No. 10 sieve 54 to 74
Passing No. 10 sieve, retained on No. 40 sieve 6 to 32
Passing No. 40 sieve, retained on No. 80 sieve 4 to 27
Passing No. 80 sieve, retained on No. 200 sieve 3 to 27
Passing No. 200 sieve 1 to 8
The asphaltic material shall form from 4 to 8 percent of the mixture by weight or from 9 to 19 percent of the mixture by volume, unless specified otherwise on the Plans.
END OF SECTION 02510
SECTION 02511 - PORTLAND CEMENT CONCRETE PAVEMENT
(SEE SHEET S702 FOR THIS SECTION)
SECTION 02514 - CONCRETE CONSTRUCTION FOR STRUCTURES
PART 1: GENERAL
1.01 SCOPE
A. Section includes all materials and work required to complete, as indicated by the Plans and Specifications, and furnish all supplementary items necessary for the proper installation of Concrete Construction for Structures.
B. Related information