SECTION 6.0 CONCRETE AND ASPHALT CONSTRUCTION FOR CURB AND GUTTER, DRIVEWAYS AND SIDEWALKS

6.01 Description

These specifications shall include concrete and asphalt curb and gutter, driveway and sidewalk work to be performed on various City streets. Work shall consist of the following items, complete in place:

(1) Concrete combination curb and gutter
(2) Concrete straight curb
(3) Plain concrete paving for sidewalks
(4) Concrete paving for driveways
(5) Asphalt paving for driveways
(6) Asphalt paving for sidewalks
(7) Adjustments of structures

All concrete and asphalt construction shall be laid on a prepared subgrade in one course with line and grade as specified by the plans or by the City Engineer.

6.02 Clearing and Grubbing

The contractor shall clear the entire area inside the construction limits as shown on the plans or as specified by the City Engineer. Clearing shall consist of the removal of fences, trees, logs, stamps, brush, vegetation, rubbish and other perishable or objectionable matter. Stumps and roots within the right-of-way lines shall be removed to a depth of six inches (6") below subgrade. Trees with a nominal diameter of six inches (6") or less shall be considered as normal clearing. Trees with a nominal diameter of six inches (6") or greater and any other unusual or unforeseen conditions shall be considered normal clearing items unless payment for such items have been negotiated between the contractor and the City Engineer in writing and written approval is given by the City Engineer prior to the removal of such items, or in the case specific bid unit items are included in the Proposal.

See Section 13.01, 14.01 and 15.01 for additional requirements.

Objectionable or spoiled material shall be removed from the project and disposed of by the contractor.

(G) Payment for normal clearing and grubbing shall be included in the unit cost per cubic yard for excavation, except when unit bids are requested for clearing and grubbing in the contract or as specified elsewhere.

6.03 Earthwork

Earthwork shall be defined as the removal of earth, soft rock or hard rock from its natural location or as the depositing of such material into the proper fill areas as designated on the plans.

The removal or depositing of such material within 6 inches of the subgrade elevation of the curb and gutter, driveway or sidewalk section shall be considered incidental to the construction and installation of the curb and gutter, driveway or sidewalk and shall be included in the unit price for such items.

(G) Payment for earthwork in excess of 6 inches above or below the subgrade elevation shall be based on the unit price per cubic yard for one and only one of the following quantities, whichever is larger:

(a) The cubic yards of material excavated from cut sections, or
(b) The cubic yards of material deposited in the proper fill or backfill areas.

Cubic yards of material shall be determined from actual field cross-sections taken before the work is begun and after the work is completed, with the following exception. In areas where the actual cut or fill has a depth greater than six inches (6") depth from the subgrade (considered incidental to the construction with concrete work) and where it is deemed expedient to the completion of the project, the City Engineer and the contractor may agree on an average depth and width to be used in the computation of the amount of cut or fill . Upon a mutual agreement of the average depth and width by the City Engineer and contractor, the contractor shall submit an invoice for payment reflecting the figures agreed upon. The invoice shall be submitted to the City Engineer before any payment has been made for that portion of the project covered by the invoice. Unit prices for excavation, fill and backfill shall include the excavation from the cut area within the project limits or the borrow area, the depositing of such material in the proper fill or backfill section or waste area, and the compaction and fine grading thereof.

(1) Excavation

The contractor shall perform all excavations to the elevations and cross sections as shown on the plans and standards. Any excavation below grades shown on plans shall be backfilled with approved material and shall be thoroughly tamped in layers of not more than eight inches (8”). Backfill material shall be compacted to limits and conditions as specified in Section 6.07.

The contractor shall control grading in the vicinity of construction to prevent surface water from running into the excavation.

Excavation of hard rock, ledge rock, boulders larger than one-half (1/2) cubic yard or more, unsuitable material, or any other unusual or unforeseen conditions shall not be considered as normal excavation and extra payment may be authorized provided, however, that such extra payment has been negotiated between the contractor and the City and written approval is given by the City Engineer. See Section 10.02, 13.01, 13.17, 14.01, and 14.13 for further explanations.

(G) Payment for normal excavation shall be at the contract unit price for excavation, fill or backfill per cubic yard of material according to this section.

(2) Fill or Backfill

All fill or backfill material shall be free of logs, roots, rubbish, organic material, and stones larger than four inches (4") in diameter. Fill or backfill material shall be placed in eight inch (8”) layers and each layer shall be compacted as specified in Section 6.06.

Where fill is inaccessible to rollers, compaction will be done by mechanical tampers with a rating of at least 300 ft.-lbs. of energy per blow.

(G) Payment for all fill or backfill shall be at the contract unit price for excavation, fill, or backfill per cubic yard of material, according to this section.

6.04 Preparation of Subgrade

Subgrade shall be fine graded to the grades and elevations as shown on the plans or as specified by the City Engineer. The subgrade shall be free of water and mud and shall have passed all compaction tests as specified in Section 6.06. Before any asphalt or concrete is placed on fill section, the City Engineer shall have inspected and approved the subgrade.

6.05 (G) Storm Drainage

Final catch basin adjustments of three inches (3") or less shall be the responsibility of the contractor when such adjustments are necessary so as to provide a uniform grade in the curb and gutter section, driveway section or sidewalk section. Such adjustments shall be included in the unit price for curb and gutter, driveways or sidewalks. See Section 11.0 .

6.06 Testing

When required by the City, the contractor shall take samples of the materials delivered to the City and shall, at his expense, have an approved engineering testing laboratory perform such test as may be required by the City. The contractor shall then present the test results to the City Engineer for his review. All such tests shall be certified by a registered professional engineer. The City also reserves the right to perform any and all tests deemed necessary by the City Engineer. Materials which fail to meet the minimum requirements of tests as set forth in this section may be rejected by the City Engineer and any such material shall be removed and replaced at the expense of the contractor.

(1) Concrete for curb and gutter, driveways, or sidewalks shall have a 28 day crushing strength of 3000 psi when tested in accordance with ASTM Test designation C39-49 or latest amendment.

(2) Asphalt for driveways and sidewalks shall meet the test requirements as set forth in Section 645 of the NCDOT specifications for Type I-2.

(3) Backfill and subgrade for curb and gutter, driveways and sidewalks shall be tested in accordance with the following testing procedures:

(a) AASHTO T 147-54 "Field Determination of Density of Soil in Place"
(b) AASHTO T 100-60 "Specific Gravity of Soils"
(c) AASHTO T 99-57 (ASTM 698) "The Moisture-Density Relations of Soils using a 5.5 lb. Rammer and a 12 inch drop" (Standard Proctor).

The following minimum density shall be obtained when tested according to AASHTO T 99 Test procedures:

(a)	Under cut backfill	100% density
(b)	Backfill for curb and gutter, driveway and sidewalks	95% density
(c)	Subgrades	95% density
(d)	Backfill for ditches outside street section	95% density

6.07 Fine Grading

The contractor shall be responsible for fine grading and bringing all grades and forms to the grades and elevations as shown on the plans or as directed by the City Engineer. Finished surfaces shall be smooth and even and shall not vary much more than 3/8 inch in 10 feet from the true profile and cross-section or more than 1/2 inch from the true elevation. Fine grading is normally considered just between the edge of gutters within the street.

Fine grading shall conform to Section 500 of the NCDOT "Standard Specifications for Roads and Structures" latest revision.

(G) Fine grading shall be included in the contract unit price for concrete curb and gutter, driveway or sidewalk or for asphalt driveway or sidewalk.

(G) Fine grading between the edge of gutters within the street shall be paid for at the contract unit price for fine grading, said contract unit price shall include all labor, material, and equipment necessary to comply with the specifications.

6.08 Miscellaneous Concrete Removal

The contractor shall remove all existing concrete curb and gutter, concrete sidewalk, concrete driveway, or other items as designated by the plans or as authorized by the City Engineer. The contractor shall remove all such material from the project to a place provided by the contractor or, if required by the City Engineer, shall deposit such material in areas provided by the City. The contractor shall restore all disturbed area to the proper cross-section so as to provide a neat and orderly appearance.

(G) Payment for concrete removal shall be based on the contract unit price for removal of concrete curb and gutter per linear foot or for the removal of concrete driveways and sidewalks per square yard of material removed (except as specified elsewhere). However, payment shall not be allowed for concrete curb and gutter, sidewalks, driveway or other items which were installed or constructed by the contractor which do not meet the approval or specifications of the City. All such materials shall be removed entirely at the contractor's expense.

6.09 Concrete Materials

Materials for concrete shall consist of a mixture of coarse aggregate, fine aggregate and Portland Cement mixed in such proportions allowing sufficient water to produce a workable concrete with uniform consistency.

No concrete shall be placed except in the presence of a City Construction Inspector. Concrete for curb and gutter, driveways, and sidewalk shall be a Class "A" (3000 psi) mix as specified in Sections **825**, 846, 848, 1000, and 1024 of the NCDOT "Standard Specifications for Roads and Structures" latest revision, **except that in 825-6 B ¶ 4, pockets (including any pocket or honeycombing) shall not be exempt.**

Aggregate for concrete shall conform to Section 1014 (1-2) of the NCDOT "Standard Specifications".

Joints

Joints are to be spaced according to the “Concrete Streets” rules of practice and “Design of Concrete Overlays” guidelines as published by the Portland Cement Association (PCA); IS 211.01P (1980) and PA 153.01P.

In general longitudinal joint spacing is not to exceed 12.5 ft. and transverse joint spacing shall not exceed 30 times the slab thickness or 15 ft. maximum. Joints should be laid out in square panels, when practical; rectangular panels

can be used if the long dimension is no more than 1-1/2 times the short. See guidelines and rules for full requirements and optional joint types. Any question as to joint spacing shall be as determined by the Engineer.

(G) All cost for Concrete complete in place including joints shall be included in the Bid Unit Price for Concrete complete in Place, units will be as specified on the Proposal.

6.11 North Carolina Department of Transportation Specifications

References to sections of the NCDOT specifications are intended to be supplementary to the City's specifications. In any conflict between NCDOT specifications and City specifications, the City's specifications shall govern.

6.12 Combination Curb and Gutter Forms

All forms **shall comply with NCDOT specification section 846** and shall be of metal, straight, free from warp, and of sufficient strength when staked to resist the pressure of the concrete without springing. Metal forms shall be of approved section and shall have a flat surface on top.

Special radius forms at street intersections will be made by fabricating 1/2" wood, or metal to obtain the proper horizontal curvature and 1-inch batter, thoroughly braced and staked to proper alignment and grade and so maintained while pouring the concrete. **Wood forms may only be used on sharp radii and upon special approval by the Engineer.**

Forms for the concrete gutter or shoulder shall be of a depth equal to the depth of the gutter.

Outside forms for the combination concrete gutter and curbing shall be of a depth equal to the combined depth of the curbing and gutter and the inside forms shall be of the depth of the curbing and gutter respectively and shall be so designed as to permit of secure fastening to the outside form and held with suitable clamps, numerous enough to prevent bulging of the forms.

All forms shall be cleaned thoroughly and oiled before concrete is placed against them. Forms which have become worn, bent, or broken shall not be used.

6.13 Division Plates

Division plates shall be one-eight inch (1/8") steel and shall exactly conform to the cross-section of the concrete shown on the plans, except that a small lug provided with a hole for a hook shall project above the surface of the concrete to aid in removing the plate. The plate shall be put in the forms ten (10) feet to twelve (12) feet apart before the concrete is placed and be kept perpendicular to the wall and top of the curb.

Plates shall be withdrawn when the concrete has been hardened sufficiently to keep the edges from joining. Edges shall be rounded to a radius of about three-eighths (3/8") inch.

6.14 Dummy Joints

In lieu of division plates as described in the preceding paragraph an alternate of one fourth inch (1/4") wide by two inch (2") deep tooled dummy joints may be used. These joints shall be straight, neat, and smooth. The joint shall meet the approval of the City Engineer.

6.15 Forming Joints

Expansion joints shall be placed approximately ninety (90) feet apart, the joint to extend entirely through the structure and to be formed at time of pouring by the use of a premolded filler set and held securely in place. The filler will extend through the joint at all points, after the forms are removed, and projecting edges of the filler will be cut off. A joint will be placed at each tangent point of return, and the space intervening between points will be divided in sections approximately ninety (90) feet as above described. The length of sections may be reduced when necessary for closures but no section less than eight (8) feet will be permitted. Premolded joint filler shall be composed of either Cork Filler or Bituminous Filler and shall conform to the requirements as outlined in NCDOT Specifications.

6.16 Driveway and Sidewalk Forms

Forms when required for this work shall be of steel and shall have a minimum length of ten (10) feet except that on curves having a radius of less than one hundred fifty (150) feet wood forms may be used. The depth of forms shall be the depth of the concrete. No built-up forms will be permitted. All forms shall be approved sections, free from all bends and warps at all times, and shall be cleaned thoroughly each time they are used before concrete is placed against them. The forms shall be set so that they have firm and even bearing throughout their entire length on the

thoroughly completed subgrade. They shall be joined neatly and tightly; the forms shall be accurately set to line and grade and braced by using at least three (3) bracing pins to each ten (10) feet length of form to resist the pressure of the concrete and the impact of the screed. At all times sufficient forms shall be used and set so that at least two hundred (200) feet of form on each side of the strip being paved shall be accurately set in advance of the point where concrete is being placed.

(a) Steel Forms

The thickness of steel shall not be less than eight (8) gage (United States Standard).

The width of the base of steel forms shall be at least six (6") inches for forms having a depth up to and including eight (8") inches. Forms having a depth of nine inches (9") or more shall have a base at least eight inches (8") wide.

(b) Wood Forms - Omitted

6.17 Finishing

The top surface of the concrete shall be finished to line and grade in a smooth, neat and even manner by means of wooden floats, or by an approved finishing machine. A slick trowel finish is not wanted. Upon removal of the forms where necessary to secure a smooth, even finish, the permanently exposed surfaces will be rubbed in an approved manner. All rejected work shall be removed and replaced without additional compensation. All joints shall be open from top to bottom, the edges adjacent to the joints being sharp and clean-cut. The curb must show no variation horizontally **and/or vertically** exceeding one-eighth inch (1/8") under **ten (10')** feet straight edge.

6. 18 Curing

As soon as the concrete has set sufficiently, it shall be sprinkled and kept Moist until covered. As soon as the concrete has set sufficiently to not be damaged or scratched, it shall be covered with damp burlap or two inches of earth or sand which shall be kept wet by watering for an additional period of not less than three (3) days, or longer, if necessary, in the opinion of the City Engineer.

In lieu of the above, the contractor may elect to use membrane curing in accordance with NCDOT Specifications.

In case the concrete is placed and the temperature is expected to fall below thirty-two (32) degrees Fahrenheit, a sufficient supply of polyethylene film, straw, hay, grass or other suitable material must be placed to cover the concrete to protect it against freezing, but care shall be taken not to mar the surface of the concrete.

The contractor shall protect the concrete from damage by rain, pedestrians, and animals with suitable covers and barricades and by red lights at night.

At no time shall more concrete be laid than can be immediately and properly finished and properly covered during daylight, unless an adequate lighting system of illuminating gas, acetylene gas or electric lights, satisfactory to the City Engineer. No annoyance to the Public shall be allowed during the night hours.

It is the duty of the contractor to prevent the marring of any surface, and he will be held responsible and required to replace any surface damage.

6.19 Expansion Joints Abutting Curbing

Whenever a sidewalk is constructed abutting a curb and gutter section or when required by the City Engineer, an expansion joint shall be formed adjacent to the curbing or other permanent structure by the use of a joint filler material. An expansion joint shall be placed between the sidewalk and the radius curbing of the street intersection to allow the longitudinal expansion of the sidewalk. The expansion joint filler shall be 1/2" thick, unless otherwise shown on the plans or requested by the City Engineer, and shall be securely fastened in position against the curb so it will not be displaced when concrete is deposited against it. Expansion joint filler shall extend to the full depth of the joint and the top shall be 1/4" below the finished surface of the sidewalk.

(G) Additional payment for expansion joint material under unit price contracts will be allowed only where the new concrete construction is being placed against existing structures (i.e. buildings, existing curb and gutter, catch basin slabs [not constructed under this contract]), etc.

(G) Payment for expansion joint material shall be based on the actual length of material installed *by* the contractor in accordance with the specifications, the above instructions, and the contract unit price. No additional payment will be allowed for expansion joint material required as part of new concrete construction paid for under the terms of this contract. The linear feet of material to be paid for shall be as measured by the City Engineer.

6.20 Concrete Curb and Gutter Machine

The City Engineer will give due consideration to the use of an extrusion type concrete curb and gutter machine. Before any such machine is used on a City project, **the contractor must demonstrate his ability to produce acceptable results to the Engineer.** In the event approval is granted for the use of such a machine, it shall produce a combination curb and gutter section of the same cross-sectional area and dimensions as required by the plans and/or standard drawings as required by the City Engineer.

Concrete used in conjunction with an extrusion type machine shall be 3000 psi concrete with a slump of not more than one and one-half inches (1-1/2"). Water shall not be added to the mix at any time after the initial batch mix.

Expansion joints shall be placed at approximately ninety feet (90') apart.. Each joint shall extend entirely through the structure and shall be formed at the time of pouring by the use of a premolded filler material set and securely held in place. All such expansion joints shall be placed perpendicular to the face of the curb, All expansion joint material used shall meet all the other requirements as set forth in Section 6.15 of these specifications. Expansion joints shall also be placed between the extruded curb and gutter section and any fixed structure.

Dummy joints shall be sawed at fifteen feet (15’) intervals and shall be perpendicular to the face of the curb. All such joints shall be sawed to a width of 3/8-inch plus or minus 1/16-inch and to a depth of two inches (2") plus or minus 1/16-inch. Water must be sprayed on the saw blade at all times during cutting of joints to prevent overheating. Immediately after sawing, the joint opening shall be thoroughly cleaned with a jet of water under pressure to remove all detritus resulting from the sawing operations. All joints shall be sawed out within 72 hours or earlier if necessary to prevent uncontrolled cracking. Sawing of joints shall not be done until the concrete has hardened sufficiently to avoid spalling and raveling.

Any portion or portions of the curb and gutter installed by an extrusion type machine that does not meet the approval of the City Engineer and is not in conformance with these specifications shall be removed and replaced by the contractor at his expense. Any sections found not to be acceptable by the City shall be removed by sawing a joint on both sides of the section to be removed and the section shall then be removed in such a manner so as not to disturb any other portions which does meet the requirements of these specifications. In no case shall remaining portions be less than eight feet (8’) from the nearest construction joint, fixed structure, or previously sawed dummy joint.

Extrusion type machines shall not be permitted to form or construct curb and gutter sections lying within the tangent points of curves with a radius of less than thirty-one feet (3l') measured from the face of the curb.

Concrete curb and gutter machines may not be used to construct any curb and gutter sections within ten feet (10') of a catch basin or other permanent structure, except where approved by the City Engineer.

6.21 Adjustment of Structures

This item shall include the adjustment of existing manholes, catch basins, valve boxes, meter boxes, etc. to the new grades required by the construction. This shall be done by removing the casting and rebuilding that part of the masonry necessary to make the top of the structure to conform to the new grade, or other methods approved by the City Engineer. Valve and meter boxes shall be adjusted by removing the box and reinstalling at the proper grade, by raising the box to the proper grade and properly securing it in place, or by other methods as approved by the City Engineer. In most cases this adjustment will be one (1) to two (2) inches.

(G) Structures which involve adjustments of six inches or less shall be included in the cost per linear foot of curb and gutter or the cost per square yard of sidewalk or driveway construction. Structures which involve adjustments in excess of six inches shall be paid for at the contract unit price per structure.

See section 5.19 for Ductil Iron Risers use.

After castings are adjusted to the proper grades, they shall be secured in a manner approved by the City Engineer.

This work shall be completed well in advance of the paving operation.

6.22 (G) Basis of Payment

Concrete Curb and Gutter

(a) The combination concrete curb and gutter will be paid for at the contract unit price per linear foot complete in place, which price shall include all materials, forms, equipment, tools, labor, fine grading, and work incidental thereto. Payment shall be made for the actual length of surface measurement of the structure installed in accordance with these specifications.

(b) Concrete pavement shall be paid for at the contract unit price per square yard complete in place, which price shall include all materials, forms, equipment, tools, labor, fine grading, and work incidental thereto. Payment shall be made for the actual square yards of surface measurement of the structure installed in accordance with these specifications.

(c) Asphalt sidewalk shall be paid for at the contract unit price, which price shall include all materials, forms, equipment, tools, labor, fine grading and other work incidental thereto. Payment shall be made for the actual square yards of surface measurement of sidewalk installed in accordance with these specifications accepted by the City.

(d) Asphalt driveway pavement shall be paid for at the contract price per square yard of asphalt driveway pavement installed, complete in place. Such price shall include all stone, asphalt and other materials needed for the paving and shall include all forms, equipment, tools, labor, fine grading and other work incidental thereto. Payment shall be made for the actual square yards of surface measured for asphalt pavement installed in accordance with these specifications and accepted by the City.

(e) Earth work shall be paid for at the contract unit price for cubic yards of earth work (excavation, fill or backfill) complete in place. Such price shall be full compensation for the excavation, placing and compaction such materials. It shall also include all materials, forms, equipment, tools, labor, fine grading and other work incidental thereto. Payment shall be made for the actual cubic yards of earth work (as determined by field cross-sections taken by the City) which have been excavated or fill in accordance with these specifications and accepted by the City.

(f) Concrete curb and gutter removal shall be paid for at the contract [in it price per linear foot which price shall include all materials, equipment, tools, labor, fine grading, and work incidental thereto. Payment shall be made for the actual length of surface measurement of the structure removed in accordance with these specifications.

(g) Concrete pavements removal shall be paid for at the contract unit price per square yard, which price shall include all materials, equipment, tools, labor, fine grading, and work incidental thereto. Payment shall be made for the actual square yards of surface measurement of the structure removed in accordance with these specifications.

6.23 Typical Sections

(a) 24” Concrete Combination Curb and Gutter

All twenty-four inch (24”) concrete combination curb and gutter shall conform to the cross-sectional area and dimensions as shown on City Standard Drawing No. 71D-9 or latest addendum. All forms for such curb and gutter shall conform to the requirements as set forth in Sections 6.11 thru 6.15 of these specifications.

(b) 30” Concrete Combination Curb and Gutter

All thirty inch (30") concrete combination curb and gutter shall conform to the cross-sectional area and dimensions as shown on City Standard Drawing No. 71D-10 or latest addendum. All forms for curb and gutter shall conform to the requirements as set forth in Sections 6.11 thru 6.15 of these specifications.

(c) 18” Mountable Concrete Curb and Gutter

All 18" mountable concrete curb and gutter shall conform to the cross-sectional area and dimensions as shown on City Standard Drawing No. 71D-13 (Type "A") or latest addendum. All forms for such curbing to Sections 6.11 thru 6.15 of these specifications.

(d) 6” x 18" Concrete Straight Curbing

All 6" x 18" concrete straight curbing shall conform to City Standard Drawing No. 71D-13 or latest addendum. All forms for such curbing shall conform to Sections 6.11 thru 6.15 of these specifications.

(e) Concrete or Asphalt Driveway Paving

All concrete or asphalt driveway paving shall conform to the typical section as shown on the plans or as required by the City Engineer. All forms used for such paving shall conform to Section 6.16 of these specifications.

(f) Concrete or Asphalt Sidewalk Paving

All concrete or asphalt sidewalk paving shall conform to the typical section as shown on City Standard Drawing No. 71D-14 or as required by the City Engineer. In most cases, sidewalk paving shall be four feet (4') in width and four inches (4") in depth. All forms used for such paving shall meet the requirements of Section 6.16 of these specifications.

6.24 Wheelchair Ramps

All street curbs in North Carolina being constructed or reconstructed for maintenance procedures, traffic operations, repairs, correction of utilities or altered for any reason shall provide wheelchair ramps at all intersections where both curb and gutter and sidewalks are provided and at other major points of pedestrian flow. The City Engineer shall make the final determination of the locations of wheelchair ramps.

(a) Curb and Gutter Removal

The concrete curb and gutter shall be removed for the full width of the wheelchair ramp. The curb and gutter may be sawed or taken out to the nearest joint as directed by the City Engineer. The contractor may be required under certain circumstances, to remove only the curb portion of the concrete curb and gutter, leaving the gutter apron in place. No payment shall be made for the removal of the curb only. Such removal shall be considered incidental to wheelchair ramp construction. Reference is made to Section 2.08 of these Special Provisions.

(b) Installation

Wheelchair ramps shall be constructed in accordance with the City of Gastonia Specifications, including but not limited to Section 6.00 thereof, and the Standard Details (71D-27 thru 71D-31).

(c) Payment (G)

(1) Payment for removal of combination concrete curb and gutter shall be made on a linear foot basis of curb and gutter actually removed.

(2) The payment for replacement of the combination concrete curb and gutter section shall be at the same rate per linear foot as standard concrete combination curb and gutter.

(3) The payment for the 6" concrete wheelchair ramp area is to be made on a square yard basis of the actual area constructed, including all required expansion joint material, and including the area of the curb where the curb only is removed.

(4) The payments are to be based on actual measurements as determined by the City Engineer or his representative.

6.25 Restoration of Disturbed Areas

The contractor shall restore all surfaces disturbed by construction. This shall include but is not limited to surfaces where: (1) The contractor exceeded the construction limits indicated on the plans, or (2) Work was necessary to adequately tie the cut or fill slopes between the new construction and the existing surface.

Where existing driveways are encountered, the contractor shall restore the area disturbed in accordance to the following schedule:

Original Driveway Surface	**Replacement Surface**
Asphalt	1.5" 1-2 asphalt, 4" ABC Stone Base
Pen. Mac.	1.5" I-2 asphalt, 4" ABC Stone Base
Concrete	4" concrete
Stone or Gravel	4" ABC Stone Base
Dirt	3" ABC Stone Base

Note: All replacement depths are compacted depths. All driveway grades shall conform to City Standard Drawing No. 7ID-21 **latest revision**, unless otherwise specified in plans or directed by the City Engineer.

6.26 Seeding, Mulch, and Tack

This item shall include all labor, equipment, and materials necessary to guarantee a full stand of permanent grass through the first growing season following its planting. All lime, fertilizer, seed, mulch and other materials provided shall be included in the bid unit price per 1000 square feet (MSF) of area seeded and mulched.

All disturbed areas shall be seeded, mulched, and tacked no later than thirty (30) days after the land disturbing activity started **for grading contracts and seven (7) days for all water, sanitary sewer, and storm drainage installation projects. Also, see sections 13.01 and 14.01.**

(a) Preparation of Site

All areas to be seeded shall be graded and shaped before applying seed. All loose rock, roots and other objects which would obstruct the establishment and maintenance of the vegetation shall be removed. In areas adjacent to or part of residential yards, the surface shall be hand-raked to remove all objectionable materials.

(b) Lime and Fertilizer

Ground Agricultural Lime shall be uniformly applied at the following rates:

Clay and clay loams	-	135 lbs./1000 S.F. (MSF)
Sandy loams, loams and silt loam	-	90 lbs./I000 S.F. (MSF)
Loamy sands, sands	-	50 lbs./1000 S.F. (MSF)

Fertilizer shall be uniformly applied at a rate of 18 to 23 lbs. per 1000 square feet. Fertilizer shall be 10-10-10, for Grass Legume mixtures use 5-10-10.

Apply Lime and fertilizer evenly and incorporate into the top 4-6 inches of soil by disking or other suitable means. Operate machinery on contour. When using a hydroseeder, apply lime and fertilizer to rough, loose surface. All lime and fertilizer shall meet all specifications of the North Carolina Department of Agriculture.

In lieu of the above rates of application, the contractor may apply lime and fertilizer at a rate specified in an approved soil test. Such soil tests shall be at the expense of the contractor and must be approved by the City Engineer.

All lime and fertilizer shall meet the specifications of the North Carolina Department of Agriculture.

(c) Seeding

All seed used shall be certified seed and shall meet the purity, germination and presence of prohibited weed standards of the North Carolina Department of Agriculture and each bag of seed used shall be "certified" to be in compliance to these standards.

Seeds shall be Bermuda Grass, Fescue or other type as approved by the City Engineer , but in all cases, shall be compatible with the surrounding yards and grassed areas. Where a seeded area is part of or adjoining a residential yard, the contractor shall determine the type of coverage in the yard and shall use a seed mixture to give a similar coverage in the seeded area.

Rates for applying seeds and seasonal limitations shall be as specified Section 6.1 of the "Erosion and Sediment Control Planning and Design Manual", as published by the NC Department of Environment, Health, and Natural Resources (hereafter referred to as the Sediment Guide).

Seed type and seeding rate shall be as specified in the approved erosion control permit.

The contractor shall guarantee a full stand of permanent grass (100% coverage of disturbed area) through the first 12 months following its planting.

(d) Mulch

Mulch shall be applied for temporary erosion control and to protect the seed and fertilizer from the natural elements. The type, application rate and specifications shall be as given in Section 6.1 of the Sediment Guide.

Mulch - dry, unchopped, unweathered small grain straw or hay free of seeds of competing plants - Spread at the rate of 1 1/2 - 2 bales per 1000 sf (MSF), depending upon the site and season. Evenly spread mulch over the area by hand or mechanical equipment. Apply mulch uniformly so that about 25% of the ground surface is visible.

Seeding and mulch are to be anchored by uniformly spraying emulsified or liquid asphalt on all areas where seeding is required. The rate of application shall be as specified in Section 6.1 of the Sediment Guide.

Emulsified Asphalt (Tack) - Apply uniformly 7.0 gallons per 1000 sf (MSF) of *rapid setting* (RS-1, CRS-1, RS-2, or CRS-2), *medium setting* (MS-1, MS-2, or CMS-2; *slow setting* (SS-1 or CSS-1). Rapid setting (RS or CRS) is formulated for curing in less than 24 hours even during periods of high humidity. Best for spring and fall.

Medium setting (MS or CMS) is formulated for curing within 24 to 48 hours.

Slow setting (SS or CSS) is formulated for use during hot, dry weather with 48 hours or more curing time.

Note - In areas of playing children or pedestrian traffic, asphalt application could cause problems of "tracking in" on rugs; damage shoes, clothing, etc. Use types RS or CRS to minimize problem.

Payment for mulch shall be included in the bid unit price per 1000 square feet (MSF) for seeding and mulching.

Unless otherwise stated in the Special Provisions, erosion control for this contract shall include the provisions that all disturbed areas shall be seeded and mulched no later than thirty (30) days after the land disturbing activity started.

(G) All cost for Seed, Mulch, and Tack shall be included in the Contract bid unit price for pipe complete in place, unless a specific request for a unit Bid Price for Seed, Mulch, and Tack per 1000 sf. (MSF) is requested in the Proposal.

6.27 Erosion Control

The Contractor shall supply all material, equipment, and labor necessary to protect the construction area and the property adjacent thereto from siltation and/or erosion damage caused by his construction. As minimum requirements, the Contractor shall install the erosion controls called for on the Project Plans and the erosion control permit issued pursuant to the "Sedimentation Pollution Control Act of 1973" as amended.

All straw bales and silt fence shall be adequately staked to prevent them from being displaced. All silting areas shall be maintained in a good functioning order throughout the Contract. The Contractor shall remove the erosion control devices after the construction site is stabilized to the point that they are no longer needed.

All items supplied/installed under this heading, shall comply with the recommendations as set forth in the NCDEHNR "Erosion and Sediment Control Planning and Design Manual".

Any items, in the City Engineer's opinion, that fails to function properly due to faulty material or faulty installation techniques used by the Contractor, shall be replaced by the Contractor at the Contractor's expense. See Plans and Special Provision for additional Erosion Control measures.

(G) All payment for these items shall be based on the actual number or linear feet, etc., of units installed as per the bid unit prices indicated on the Proposal for the appropriate items. No additional payment will be allowed.