STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
P.O. Box 94245
Baton Rouge, Louisiana 70804-9245
www.dotd.la.gov
225-379-1485

BOBBY JINDAL
GOVERNOR

WILLIAM D. ANKNER, Ph.D.
SECRETARY

June 8, 2009

STATE PROJECT NO. 742-36-0110
FEDERAL AID PROJECT NO. 3600(511)
ROBERT E. LEE BOULEVARD IMPROVEMENTS (PARIS AVENUE TO PRATT DRIVE)
ORLEANS PARISH

SUBJECT: ADDENDUM NO. 1 (CONSTRUCTION PROPOSAL REVISION)

Gentlemen:

The following proposal revision dated 06/08/09 on the captioned project for which bids will be received on Wednesday, June 17, 2009 have been posted on http://www.dotd.la.gov/cgi-bin/construction.asp.

1. Revised the Technical Specifications. (102 pages)

Please note this revision in the proposal and bid accordingly. Mandatory electronic bidding is required for this project, and electronic bids and electronic bid bonds must be submitted via www.bidx.com for this letting date.

Sincerely,

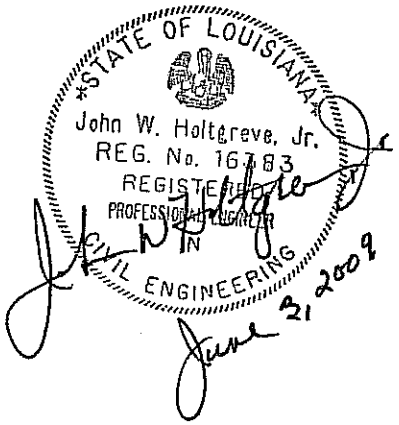
RANDAL D. SANDERS, P. E.
CONTRACTS & SPECIFICATIONS ENGINEER

Attachments
ec: Mr. Brian Buckel
Mr. Michael Stack
Mr. Francis Berger
Ms. Laura Riggs
Mr. Fred Wetekamm
Mr. Eric Burges
Mr. Masood Rasoulian
City of New Orleans

TECHNICAL SPECIFICATIONS

DBE GOAL PROJECT

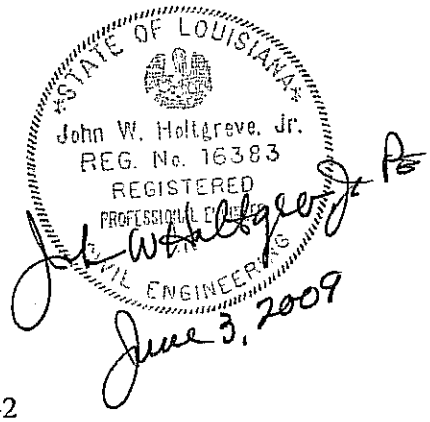
STATE PROJECT NO. 742-36-0110
FEDERAL AID PROJECT NO. 3600 (511)
ROBERT E. LEE BOULEVARD
(PARIS AVENUE TO PRATT DRIVE)
ORLEANS PARISH



SUPPLEMENTAL SPECIFICATIONS
FOR
STATE PROJECT No. 742-36-0110

ROBERT E. LEE BOULEVARD
(PARIS AVENUE TO PRATT DRIVE)
ORLEANS PARISH

TABLE OF CONTENTS



STATE PROJECT NO. 742-36-0110
SPECIFICATIONS FOR INSTALLATION OR REPLACEMENT OF DRAINAGE

SECTION C701 INSTALLATION OR REPLACEMENT OF DRAINAGE

Section 701 of the Standard Specifications for Roads and Bridges, 2006 Edition, shall be amended as follows:

SECTION C701 – INSTALLATION OR REPLACEMENT OF CULVERTS AND STORM DRAINS (REVISED)

Culverts and storm drains shall conform to all of the requirements of the General Specifications and Standard Plans of the Sewerage & Water Board (S&WB) of New Orleans (the latest revision) except as noted herein.

C701.01 GENERAL:

(a) The Contractor shall furnish all materials, equipment, labor and supervision to remove the existing deteriorated main, install new mains and fittings, including appurtenances such as tie-ins to existing system, lumber foundation, bedding, backfilling, necessary dewatering and bypass pumping during the execution of this contract.

(b) All workmanship, material and tests shall conform with Section E of the General Specifications of the S&WB, S&WB Standard Drawings and S&WB Standard Drawing No. 7260-SWD except as noted herein.

(c) The Contractor shall notify the Chief of Engineering of the S&WB in writing not less than three or more than ten working days in advance of starting the job so as to schedule the inspection of the work. Failure to do so prior to starting work will result in the Contractor being required to expose the bedding on all pipe previously installed.

(d) The Contractor may use more than one crew in performing work in various sections of a system at a given time, provided he has the approval of the Director.

(e) The Contractor performing work under this contract shall be required to coordinate his operations with the S&WB and other utilities prior to making any excavation. The Contractor shall exercise caution in making excavations to avoid damage to these services and other utilities.

(f) Water and sewer services which are damaged by the Contractor shall be repaired by the S&WB at the Contractor's expense. The Contractor will be furnished a list of the locations of water and sewer house connections. This listing is from S&WB records and the listed locations could vary from the actual locations. It is the Contractor's responsibility to verify the location of these services and to protect them from damage. Furnishing this information should not be construed as a waiver of the Contractor's liability, but rather an attempt on the part of the Board to minimize the Contractor's hazards.

(g) Existing drain house connections shall be tied into the new mains. No new drain house services shall be installed.

C701.02 INSTALLATION:

Where the entire drain line is replaced between manholes, the drain pipe shall be reinforced concrete pipe conforming to Section C of the General Specifications of the S&WB and to the Standard City Plans, unless otherwise noted. Bedding and foundation lumber for drain lines shall be in accordance with S&WB Standard Drawings No. D-3809, No. D-3810, No. D-3933 and D-3934.

The new drain lines and house connections, where required, shall be installed at the elevations and locations indicated, unless changed by the Director. The Contractor shall schedule his work so that the drain lines and catch basin connections between two manholes are completed before moving to another location.

Backfill material shall be pumped sand and shall be placed at or near optimum moisture content and compacted according to one of the following procedures:

1. Backfill material shall be placed in layers not to exceed 12 inches. Each layer shall be compacted to a minimum of 95 percent of maximum density using approved mechanical compaction equipment, or:

2. Backfill material may be placed in layers not exceeding 3 feet by thoroughly flooding and compacting each layer to a minimum of 95 percent maximum density, prior to placing a subsequent layer. During placement, backfill materials shall be thoroughly saturated with water and satisfactory drainage of materials shall be provided. The above backfill material compaction procedures shall be applied also for any service connections, and trench filling were pipe or catch basins/manholes have been moved.

Filter cloth around the joints of drain lines shall be non-woven conforming to ASTM Section D 1910. The fabric shall be wrapped around the entire joint with a twelve-inch minimum overlap and a twelve-inch minimum on each side of the joint and shall be secured to the pipe in a manner acceptable to the S&WB.

C701.03 DRAIN HOUSE CONNECTIONS:

All existing drain house connections shall be removed and replaced with new PVC pipe from the new drain line to one (1') foot behind the curb where it will be tied to the existing drain house connection pipe.

The new house connection pipe will be connected to the new reinforced concrete pipe by drilling the concrete pipe and by using a rubber boot (Kor-n-Seal boot or approved equal) or sand impregnated PVC bell grouted in the concrete pipe, to connect the new PVC pipe.

The need for replacing existing drain house connections from the back of the curb to the property line (or any point between) shall be determined by DPW after field

inspection or as indicated on the drawings. The new pipe will be tied to the existing pipe at that point.

If the existing drain line is being removed and not replaced, or if DPW determines it is necessary, an alternate method may be utilized by connecting the existing drain house connections into a PVC collector line located behind the curb and tied into the catch basins or manholes, as directed by DPW.

No bends greater than 45 degrees will be allowed in drain house connection pipe.

No drain house connection shall be installed in the corners of catch basins. All connections shall be in the side or back of the catch basin.

All pipes and fittings shall be approved by DPW. The connection of any two dissimilar house connection materials shall be accomplished by the installation of a "No-Hub" coupling consisting of a neoprene sleeve and bushing adapter and two stainless steel bands. The coupling shall be manufactured in strict accordance with Cast Iron Soil Pipe Institute Specifications C-301, latest revision, as manufactured by Tyler Pipe Company, Mission Clay Products Corp., Fernco, or approved equal.

Where it is necessary to connect the drains to existing manholes, catch basins, or canals, the existing short bell pieces remaining in the wall of the structure shall be inspected. If in bad condition, the short bell pieces shall be broken out and new short bell pieces inserted to the full thickness of the walls and permanently grouted (see latest S&WB Dwg. 6178-B-6). The annular space between the concrete pipe and the wall of the structure shall be grouted with a type three, high early strength cement, or quick setting EMBECO or similar material.

If a PVC pipe is to be connected to a manhole or other concrete or brick drainage structure, the Contractor shall use a sand-impregnated PVC stub, grouted with cement grout as specified above, for the manhole connection.

Drain house connections shall be backfilled as described herein for drain lines.

C701.04 POINT REPAIRS OF EXISTING DRAIN LINES:

Where the existing drain line has to be removed and replaced with new concrete pipe, said pipe fittings shall conform with Section E of the S&WB General Specifications. Bedding and foundation lumber for the drain line shall conform with S&WB drawings No. D-3809, No. D-3910, No. D-3933 and No. D-3934. Bedding and foundation lumber shall extend under the existing pipe for a distance of not less than 12 inches from the end of pipe to insure proper bedding under the coupling.

The Contractor shall make point repairs to the lines at specific locations shown on the drawings and as listed in the schedule of bid prices. Point repairs shall be made by dry type and shall conform to Section XII of NASSCO (National Association of Sewer Service Companies). The Contractor shall make an excavation to expose a basic "ten

(10) linear feet" of main per point repair. Any additional footage of repair beyond the ten-foot minimum for each point repair shall be approved by the Director or as indicated on the Drawings as "Beyond point repair." The Contractor is required to have all materials and equipment on hand prior to the start of excavation so that there will be a minimum of inconvenience to the residents. Backfill will be in accordance with the same as described herein for new drain lines.

For drain point repairs, and for all other drain repairs, the connection of any two dissimilar materials shall be accomplished by the installation of a "no-hub" coupling consisting of a neoprene sleeve and bushing adapter, two stainless steel bands and stainless steel screws. The coupling shall be manufactured in strict accordance with the Cast Iron Soil Pipe Institute Specifications C301, latest revision, as manufactured by Tyler Clay Products Corp., Fernco, or approved equal.

C701.05 INSPECTION:

At the completion of the point repair or replacement of mains between manholes, and prior to final acceptance, DPW or the S&WB may inspect the mains with a remote controlled television unit or by visual inspection of large lines. The Contractor will be required to repair, at his expense and in an approved manner, all defects in his workmanship disclosed by these tests and inspections before final acceptance.

C701.06 AS BUILT DRAWINGS:

The Contractor shall furnish a set of "as built" drawings upon completion of the work and prior to final inspection. These drawings shall be a legibly marked set of prints of the Contract Drawings, revised to show clearly all field changes.

C701.07 MEASUREMENT:

Drain pipes will be measured in place and the length determined by measuring from center to center of manholes, or other subsurface structures of which they form a part. If the drain line is connected to a square or rectangular manhole, the measurement will be to the center of the manhole. If the drain line is connected to a box canal wall, the measurement will be to the face of the wall.

C701.08 PAYMENT:

Payment for the accepted quantities will be made at the contract unit price.

(a) Payment for reinforced concrete pipe shall be made at the contract unit price, per linear foot of the types and sizes specified, including excavation, removal of existing pipe (if any), foundation lumber, bedding, engineering fabric, backfill, complete shoring, pumping as necessary and tie-ins to existing manholes and catch basins. (Bid Items C701(53) or C701(54)).

(b) Payment for reinforced concrete wye in a new drain line shall be made at the contract unit price pre Item No. C701(59) and shall be in addition to the payment per

linear foot for reinforced concrete drain pipe.

Payment for reinforced concrete wye in an existing drain line shall be made at the contract unit price per Item No. C701(65), including a ten (10') foot point repair (total length including wye), couplings, excavation, removal of existing pipe, granular bedding, engineering fabric, backfill, foundation lumber, shoring and pumping as necessary and saw cutting of existing pipe. (Bid Items C701(53) or C701(54)).

(c) Payment for reinforced concrete tee shall be made at the contract unit price, per Item No. C701(66).

(d) Payment for point repairs of existing drain lines, up to ten (10') feet shall be made at the contract unit price, per each of the sizes specified, including excavation, foundation lumber, bedding, engineering fabric, backfill, complete shoring and pumping, as necessary, pipe fittings, couplings saw cutting existing pipe, removal of existing pipe and tie-ins to existing manholes if required as per Item No. C701(68). Payment for point repair beyond ten (10') feet shall be made at the contract unit price per linear foot, including the above work, as per Item No. C701(69).

(e) Drain house connections from new drain line to back of curb shall be paid per each including, fittings, tie-ins, excavation, backfilling, removal of existing pipe (if any) and drilling the reinforced concrete pipe, per Item No. C701(70). Payment for drain service line tie-ins beyond back of curb will be made by the linear foot of tie-ins service lines, including the removal of existing pipes, fittings, and backfill (Item C701(71). PVC collector line to catch basins for drain house connections shall be paid per linear foot, including, fitting, tie-ins to catch basins, excavation and backfilling per Item No. C701(72).

Payment will be made under:

ITEM NUMBER	PAY ITEM	PAY UNIT
C701(53)	Reinforced Concrete Pipe (Size)	Linear Foot
C701(54)	Reinforced Concrete Arch Pipe (Size)	Linear Foot
C701(57)	Yard Drain Service Line (Size and Type)	Linear Foot
C701(58)	Reset Culvert Pipe (Size)	Linear Foot
C701(59)	Reinforced Concrete Wye or Arch Equivalent – New (Size)	Each
C701(65)	Reinforced Concrete Wye or Arch Equivalent – Existing (Size)	Each
C701(66)	Concrete Tee (Size)	Each
C701(67)	Clean and Flush Culvert	Linear Foot
C701(68)	Point Repair to Existing Drain Lines up To Ten (10') Feet (Size) Line	Each
C701(69)	Beyond Point Repair of Existing Drain Lines	Linear Foot
C701(70)	Drain House Connection (6" PVC)	

	From New Drain Line to Back of Curb	Each
C701(71)	Drain House Connection Beyond Back of Curb (Size)	Linear Foot
C701(72)	Collector Line to Catch Basins for Drain House Connections (Size)	Linear Foot

STATE PROJECT NO. 742-36-0110
SPECIFICATIONS FOR MANHOLES, CATCH BASINS, DROP INLETS, AND CLEAN-OUTS

SECTION C702 MANHOLES, CATCH BASINS, DROP INLETS, AND CLEAN-OUTS

Section 702 of The Standard Specifications for Roads and Bridges, 2006 Edition, shall be amended as follows:

C702.01 DESCRIPTION:

This work consists of the construction and adjustment of manholes, catch basins, drop inlets and cleanouts in accordance with the General Specifications and Standard Plans of the Sewerage and Water Board of New Orleans (the latest revision), and in conformity with lines shown on the plans or established. The surrounding structure shall be backfilled and compacted in accordance with Subsection C701.02.

C702.02 CONSTRUCTION REQUIREMENTS:

(a.) **MANHOLES.** (NO. 1, No. 2, No. 3, Standard Drain Manholes, Special Drain Manholes and Special Conflict Manholes.) Manholes shall be built according to the Standard Plans of the S&WB and/or as indicated on the plans.

(b.) **CATCH BASIN ADJUSTMENTS.** (Type A, Type B and Type C.)

(1) Type A: The work consists of making slight adjustments in alignment and raising or lowering the elevation of the casting, no additional walls are required.

(2) Type B: The work consists of building a wall inside the wall and outside of the front wall of the basin or racking over or drawing in the rear wall and building a brick wall outside of the front of the front wall or vice versa, and preserving and reusing the footing courses and subgrade lumber and the side walls.

(3) Type C: The work consists of removing the basin completely and rebuilding it either at the same location or at a different location, as directed.

(c.) **CATCH BASINS AND DROP INLETS.** (No. 1, Double No. 1, No. 2, No. 3, No. 4, No. 5, Standard Catch Basin, Standard Drop Inlet, Single and Double Mountable Catch Basins.)

The structures shall be built conforming to the Standard Plans of the S&WB.

(d.) **REHABILITATE EXITSTING CATCH BASINS.** The work consists of reshagging inside, stopping leaks and resealing where required.

(e.) **REHABILITATE EXISTING MANHOLES.** The work consists of reshagging inside, stopping leaks and resealing where required.

(f.) **TAP-IN TO EXISITING DRAIN LINE.** The work consists of breaking out the existing drain line and tapping the new drain line into it including stub.

(g.) **ADJUST MANHOLE OR DROP INLET.** The work consists of adjusting manholes or drop inlets to grade with brick or mortar where directed. When using rings, stack a maximum of two (2) rings up to four (4") inches. Manhole rings of a type approved by the S&WB.

(h.) **SIX (6") INCH DRAIN CLEANOUT FOR ROOF DRAIN.** The work consists of installing new a cleanout box with casing for roof drain in accordance with plans.

(i.) **CLEANOUT BOX IN EXISTING CULVERT AND NEW CULVERT.** The work consists of installing a new brick cleanout box with casting in accordance with the plans.

C702.03 MEASUREMENT:

New and adjusted manholes, catch basins, drop inlets and cleanouts will be measured by the unit, New or rehabilitated manholes will be measured per each. Excavation and backfill shall not be measured for payment.

C702.04 PAYMENT:

Payment for the accepted quantities will be made at the contract unit price.

(a.) Payment for "standard manhole" shall be made at the contract unit price per each, including excavation, granular bedding and backfilling.

(b.) Payment for "catch basin adjustment" shall be made at the contract unit price per each, including excavation, granular bedding and backfilling, For type C, the price shall include the risk of breakage and replacement of any casting and the cost of bricking up the front grating where necessary, so as to make such catch basins conform to a No. 1 standard catch basin.

(c.) Payment for "catch basin & drop inlet" shall be made at the contract unit price per each, including excavation, granular bedding and backfilling.

(d.) Payment for "rehabilitate existing catch basin" shall be made at the contract unit price per each.

(e.) Payment for "rehabilitate existing manhole" shall be made at the contract unit price per foot height.

(f.) Payment for "tap-in to existing drain line" shall be made at the contract unit price per each.

(g.) Payment for "adjust manhole or drop inlet up to six (6") inches with brick and mortar" shall be made at the contract unit price per each, including the base material (Portland cement concrete or asphaltic) to be replaced around the manhole. Payment for "adjust manhole or drop inlet over 6 (6") inches" shall be made at the contract unit price per foot height, or any function of a foot, including the above work. Payment for "adjust manhole with rings up to four (4") inches" shall be made at the contract unit price per each.

(h.) Payment for "six (6") inch drain cleanout for roof drain" shall be made at the contract unit price per each, including excavation and backfilling.

Section Table of Contents

SECTION C706 – DRIVEWAYS AND SIDEWALKS

STATE PROJECT NO. 742-36-0110
SPECIFICATIONS FOR DRIVEWAYS AND SIDEWALKS

SECTION C706 DRIVEWAYS AND SIDEWALKS

Section 706 of the Standard Specifications for Roads and Bridges, 2006 Edition, shall be amended as follows:

C706.01 DRIVEWAYS:

(a) Driveways shall be constructed of such lengths and widths and at such points as shown on the plans or as may be designated by the Director.

(b) Where driveways are to be constructed within the sidewalk area, where lip concrete curb is installed, the details of the driveways shall be as shown on Standard Plans for Standard Mountable Driveways or Heavy Duty Mountable Curb Driveway, as specified in the proposal.

(c) All standard driveways shall be six (6") inches and all heavy duty driveways shall be eight (8") inches in thickness. Driveways shall be constructed of Portland cement concrete having a minimum compressive strength of three thousand (3,000) psi. at twenty-eight (28) days. The minimum cement content shall be five and one-half (5-1/2) bags per cubic yard of concrete. The maximum water content, including free water in the aggregate, shall not be greater than six (6) gallons per bag of cement. The consistency of the concrete shall be such as to have a slump of from two (2") inches to four (4") inches.

(d) Driveways shall be reinforced with 6 X 12 0/1 welded wire fabric weighing seventy-seven (77) pounds per hundred (100) square feet.

(e) Expansion joints shall be provided where shown on Standard Plans or as may be otherwise directed.

(f) Weakened plans shall be formed by a jointing tool or other acceptable means. Weakened planes shall extend into concrete for at least ¼ of the depth and shall be approximately 1/8 inch wide.

A longitudinal weakened plane shall be formed along the centerline of drives more than 16 feet wide, and transverse weakened planes shall be formed at not more than 16-foot intervals.

(g) The subgrade on which the driveways are to rest shall be thoroughly rolled or tamped so as to be uniformly compacted and solidified. The finished grade shall be smooth, even, well-graded and exactly parallel to the finished surface of the driveway.

(h) Immediately after placing and tamping the concrete in place, it will be brought to the established grade by means of a strike board. Finishing shall be completed by use of a soft-haired brush, moved lightly over the surface in the direction of the width of the driveway. Joints are to be straight and square, in good alignment and edges finished by a joiner, so as to avoid sharp corners.

C706.02. PORTLAND CEMENT CONCRETE SIDEWALK OR BANQUETTE PAVEMENT:

(a) Portland cement concrete sidewalk or banquette pavement shall be of such widths and fixed at such elevations as may be stipulated in the proposal and special specifications, or may be otherwise designated by the Director. They shall consist of one course Portland cement concrete pavement four (4") inches in thickness.

(1) The concrete shall have a minimum compressive strength of three thousand (3,000) psi. at twenty-eight (28) days. The minimum cement content shall be five and one-half (5-1/2) bags per cubic yard of concrete. The maximum water content, including free water in the aggregate, shall not be greater than six (6) gallons per bag of cement. The consistency of concrete shall be such as to have a slump of from two (2") inches to four (4") inches.

(2) Sidewalks or banquettes shall be reinforced with 6 X 6 6/6 wire mesh weighing forty-two (42) pounds per hundred square feet.

(b) In preparing the subgrade on which the Portland cement concrete sidewalk or banquette pavement will be placed, all soft and spongy places shall be removed and all depressions filled with suitable materials which shall be thoroughly compacted in layers not exceeding six (6") inches in thickness. The subgrade shall be thoroughly tamped until it is brought to a firm, unyielding surface. It shall have a slope in conformity with the slope of the finished surface of the Portland cement concrete sidewalk or banquette pavement.

When the Portland cement concrete sidewalk or banquette pavement is to be constructed over an old path composed or gravel or cinder, the old path shall be entirely loosened, the material spread for the full width of the subgrade and compacted as specified.

(c) All fills shall be made in a manner satisfactory to the Director. The use of muck, quicksand, soft clay, spongy or perishable material is prohibited. The top of all fills shall extend at least two (2') feet beyond the sidewalk or banquette pavement on each side and the sides shall have a maximum slope not greater than one (1) vertical to one and one-half (1-1/2) horizontal before any Portland cement concrete sidewalk or banquette pavement will be allowed to be placed thereon.

(d) Concrete shall be of the strength and consistency herein before described. The method of mixing and placing shall be in conformance with the requirements of Subsections C601.20 and C601.21, Portland cement concrete pavement. Concrete that does not flush readily shall be removed immediately from the grade and not re-used, except that the coarse aggregate can be salvaged by washing.

(e) After mixing, the concrete shall be handled rapidly and the successive batches deposited in a continuous operation completing individual sections to the required depth and width. The forms shall be filled and the concrete struck off and tamped. The method of placing the various sections shall be such as to produce a straight clean joint between them so as to make each section an independent unit. If dirt, duct or other foreign substances collect on the surface, they shall be removed before the trowelling is started.

(f) After the concrete has been tamped in accordance with subsection C706.02 (e), it will be brought to the established grade by means of a strike board, and it will then be worked

with a wood float in a manner which will thoroughly compact it and provide a surface free from depressions or irregularities of any kind. Excessive working shall be avoided. In no case shall dry cement and sand be sprinkled on the surface. The surface edges of all slabs shall be rounded to a radius of one-half (1/2") inch.

(g) Portland cement concrete sidewalk or banquette pavement shall be divided into blocks of such dimensions, by means of a joiner or grooves, as shown on the Standard Plans or as the Director may designate. Weakened planes shall be formed by a jointing tool or other acceptable means. Weakened planes shall extend into concrete for at least one-quarter (1/4") inch of the depth and shall be approximately one-eighth (1/8") inch wide. Spacing of weakened planes shall be equal to the width of the sidewalk. Transverse expansion joints shall be made at intervals of about ninety (90) feet and constructed in accordance with the standard plans.

All expansion joints shall be carefully made so as to be truly perpendicular to the surface of the sidewalk or banquette pavement and at right angles to the edge of same. The surface of the concrete adjacent to expansion joints shall be finished with a wood float, which is divided through the center and which will permit finishing on both sides of the joint at the same time. An expansion joint shall also be provided adjacent to solid walls of masonry, behind curbs, at intersections and at footlaps. Where posts or poles fall within the limit of the sidewalk or banquette pavement, and expansion joint not less than one-half (1/2") inch in width shall be placed around said posts or poles and filled with joint filler. In the case of expansion joints adjacent to masonry walls, at footlaps and around posts or poles, the joint filler shall not extend above the surfaces of the sidewalk or banquette pavement and any excess filler that so protrudes shall be cut off and made flush with the sidewalk or banquette pavement.

(h) As soon as the finished work has hardened sufficiently to prevent damage, the surface of the walk shall be covered with curing compound. The freshly finished work shall be protected from hot sun and drying winds until it can be covered as above specified. Curing by application of chemicals or some other method of curing may be used upon the approval of the Director. The concrete surface must not be damaged or pitted by raindrops and the contractor shall provide and use, where necessary, sufficient tarpaulins to completely cover all sections that have been placed within the preceding twelve (12) hours. The contractor shall erect and maintain suitable barriers to protect the walk from traffic, and any section damaged from traffic or other causes, shall be repaired or replaced by the contractor at his own expense, in a manner satisfactory to the Director. The walk shall not be opened to traffic until the prescribed curing period has expired.

(i) Portland cement concrete sidewalk or banquette pavement at intersections, including ramps for the handicapped, shall be sixe (6") inches thick and placed as above specified.

C706.03 BRICK SIDEWALK OR BANQUETTE PAVEMENT:

(a) Brick sidewalk or banquette pavement shall be of such width, grades or elevations as shown on plans or as may be designated by the Director and laid in the manner herein described and as shown on the standard plan.

(b) The surface of the earth upon which the brick sidewalk or banquette pavement will rest shall be first graded and tamped and otherwise prepared as specified for Portland cement concrete sidewalk or banquette pavement.

(c) Five (5") inches of reinforced concrete foundation having a compressive strength of not less than three thousand (3,000) psi. in twenty-eight (28) days shall be poured and tamped. The brick shall be laid on a prepared subgrade, a minimum of a three-eighths (3/8") inch setting bed which is composed of one (1) part cement to three (3) parts sand. Bricks shall be in close contact with each other and thoroughly tamped. After tamping, they shall be thoroughly sprinkled and all joints shall at once be completely filled with grout formed of one (1) part Portland cement concrete to three (3) parts sand. Thereafter, clean, sharp sand shall be evenly spread on the surface to at thickness of approximately one-half (1/2") inch. When the grout has been in place for seventy-two (72) hours or longer, this sand shall be removed and may be re-used at the option of the contractor.

(d) After completion, the brick sidewalk or banquette pavement shall be closed to traffic and not opened until so directed by the Director. The contractor will be required to barricade and protect the walk in every way as prescribed and required for Portland cement concrete sidewalk or banquette pavement.

(e) Brick sidewalk or banquette pavement will be paid for by the square yard, at the price bid in the proposal for that item, which price shall include grading and all the materials, reinforced concrete foundation, labor, tools, equipment and service employees used in completing the brick sidewalk or banquette pavement in place as herein described.

C706.04 RELAYING SIDEWALK OR BANQUETTE PAVEMENT:

(a) All sidewalk or banquette pavement relaid shall conform to the requirements herein fixed for new sidewalk or banquette pavement. Where old bricks are not suitable for relaying, they shall be replaced by new brick.

(b) When Portland cement concrete sidewalk or banquette pavement is unavoidably disturbed in executing the work embraced by the specifications, the limits of the area proposed to be disturbed or removed shall be sharply defined by the contractor with concrete saw made lines and then carefully removed along said lines. Should the surface fracture along irregular lines, a straight line shall be struck and the edge made true. When other sidewalk or banquette pavement is unavoidably disturbed, they shall be restored by the contractor to the same conditions in which they were before they disturbed them, and for such work , he shall be compensated at the prices bid in the proposal for relaying sidewalk or banquette pavement; no compensation shall be allowed for relaying sidewalk or banquette pavement that has been unnecessarily disturbed.

(c) Relaying sidewalk or banquette pavement shall be paid for by the square yard at the price bid in the proposal for those items, which price shall include all materials, labor, tools, equipment and services employed in taking up the sidewalk or banquette pavement and restoring them to the same condition in which they were before being disturbed, including the grouting of old brick. Exception is made in the case of Portland cement concrete sidewalk or banquette pavement, which price shall include all material, labor, tools, equipment and services employed in taking up and relaying them.

C706.05 MINIMUM SIDEWALK OR BANQUETTE TREATMENT WITHIN THE DOWNTOWN DEVELOPMENT DISTRICT:

This will be in accordance with Section 61.27.1 of the City Code.

C706.06 MINIMUM SIDEWALK OR BANQUETTE TREATMENT WITHIN THE VIEUX CARRE:

This will be in accordance with Section 61.27.2 of the City Code.

C706.07 TILE STREET NAMES:

(a) LETTERS OR NUMBERS FOR TILE STREET NAMES: Letters or numbers for tile street names shall be hard, tough, durable, porcelain tile or other material satisfactory to the Director. The letters or numbers shall be block type on tile not less than five and one-half (5-1/2") inches, nor greater than six (6") inches high. The letters or numbers shall not be less than five (5") inches high, of blue or willow green in color, on a white background.

(b) RESETTING TILE STREET NAMES: Existing tile street names shall be salvaged intact by saw-cutting the name out of the concrete in which the tiles are imbedded. The saw-cut shall be located two (2") inches away from the name's perimeter and will extend through the depth of the concrete, usually four (4") inches. The salvaged street name tile shall be reset in the fresh concrete of the sidewalk intersection, flush with the level of the sidewalk and clean of any cement residue.

C706.08 MEASUREMENT:

The area of driveways will be determined by surface measurements and no extra allowance will be made for shoulders.

Sidewalk pavements will be paid for by surface measurements and no deduction will be made for subsurface structures occupying less than five (5) square feet of area. Areas under structures encroaching on public property not paved will not be included in the surface measurement.

C706.09 PAYMENT: Payment for concrete driveways, sidewalks or banquette pavement will be made at the contract price per square yard, which includes excavation, installation of expansion joint and welded wire fabric. Granular material for adjustment and

removal of existing driveways, sidewalk or banquette pavement shall be paid for in other items.

Payment for "letters or numbers for Tile street names" will be per each tile at the contract unit price.

Payment for "Resetting Tile Street Name" will be per name at the contract unit price.

Payment will be made under:

ITEM NO.	PAY ITEM	PAY UNIT
C706(51)	Concrete Sidewalk (___" Thick)	Square Yard
C706(52)	Concrete Driveway (___" Thick)	Square Yard
C706(54)	Sidewalk at intersection Including Handicapped Ramps (___" Thick)	Square Yard
C706(55)	Sidewalk in Median Including Handicapped Ramps	Square Yard
C706(56)	Handicapped Ramp (Specify Concrete Brick or Stone)	Square Yard
C706(57)	Brick Sidewalk	Square Yard
C706(58)	Relaying Brick Sidewalk	Square Yard
C706(59)	Stone Sidewalk	Square Yard
C706(60)	Relaying Stone Sidewalk	Square Yard
C706(61)	Letter or Number for Tile Street Name	Each
C706(62)	Resetting Tile Street Name	Each

SECTION C707 – CURBS AND GUTTERS

STATE PROJECT NO. 742-36-0110
SPECIFICATIONS FOR CURBS AND GUTTERS

SECTION C707 CURBS AND GUTTERS

Section 707 of the Standard Specifications for Roads and Bridges, 2006 Edition, shall be amended as follows:

C707.01 INTEGRAL CONCRETE CURB, STRAIGHT OR CIRCULAR: Integral concrete curb shall be either mountable or barrier curb. Concrete curb and barrier curb shall be constructed monolithically with the same materials, having the same compressive strength and placed and cured in the same manner as the roadway slab. The dimensions shall be as shown on standard plans. The overall depth shall be determined by the curb exposure, depth of gutterbottom and roadway slab.

(a) The curb forms shall provide for the dimensions specified and must be set to the established grades.

(b) Premoulded joint filler shall be placed and extended through the entire curb section, at those points where joint filler is used in the roadway slab.

C707.02. COMBINED CONCRETE CURB AND GUTTERBOTTOM AND/OR CONCRETE CURB, STRAIGHT OR CIRCULAR:

(a) Combined concrete curb and gutterbottom shall be either combined mountable concrete curb and gutterbottom or barrier concrete curb and gutterbottom. Concrete curb shall be either mountable or barrier. The type of concrete curb or concrete curb and gutterbottom to be provided shall be as shown on plans. The forms to be used shall conform to the requirements of these specifications on "FORMS".

(1) The concrete used shall be mixed with the same materials, having the same compressive strength and shall be cured in the same manner as specified for "Reinforced Concrete Roadway Pavements".

(2) Where it is required to construct concrete curb and gutterbottom, the curb and gutterbottom must be poured monolithically.

(3) Undowelled contraction joints shall be placed through the entire width of the concrete curb or curb and gutterbottom, at no greater than twenty (20') foot intervals. Contraction joints shall be formed by a jointing tool or other acceptable means, having a 2" depth and ¼" width and filled with silicone sealant or an approved joint sealant.

Dowelled expansion joints shall be placed at intersections, not to exceed three hundred (300') foot intervals, and /or as indicated on the plans.

Pre-moulded joint filler shall be placed through the entire section of the concrete curb or curb and gutterbottom. The concrete curb and gutterbottom shall be reinforced in accordance with the standard plans.

(4) The forms shall provide for the dimensions specified and must be set to the established grades. After placing, concrete shall be worked with a float, in a manner that will thoroughly compact it and provide a surface free from depressions or irregularities of any kind.

C707.03 CONCRETE GUTTER:

(a) Where the concrete gutter is constructed as a part of combined curb and gutterbottom, it shall conform to the requirements of combined curb and gutterbottom. Jointing shall conform to subsections C601.06(a) and C601.06(b).

(b) Where the concrete gutter is constructed in conjunction with roadway pavement, it shall, unless otherwise specified or directed, be poured monolithically with, become part of, be laid at the same time, in the same manner and have the same compressive strength as concrete roadway foundation, for such roadway pavements. It shall be of the same width indicated on the plans and of such depth as will be equal to the combined thickness of the roadway foundation and the roadway pavement wearing surface.

(c) The subgrade shall meet the requirements for roadway pavement sub-grade.

(d) Immediately after the concrete has been placed, it shall be tamped, struck off and worked with a wood float in a manner to provide a surface free from irregularities and depressions, bringing the mortar to the top. The surface shall then be broomed or brushed with a soft hand broom in the direction of the flow line of the gutter. Surface joints shall be made by a steel joining tool and premoulded joint filler shall be placed and extended through the entire gutter section at those joints where filler is used in the roadway slab or curb.

(e) Curing the gutter shall be similar to that provided for roadway pavement.

C707.04 STONE CURB:

(a) Stone curb shall either be old stone curb or new stone curb as herein specified.

(b) Old stone curb shall be of suitable quality with well-defined face and top, or the depth not less than prescribed for new curb and not less than three (3') feet in length.

(c) New stone curb shall be best North River Blue Stone or Cabin Creek Blue Stone or Granite or similar stone acceptable to the Director, and shall measure five (5") inches in thickness for the remainder of depth, and in lengths of not less than five (5') feet except for closures. T shall be of such depth as may be indicated on the plans or otherwise specified. The top of the curb shall be peen-hammer dressed, and the face for ten (10") inches below the top pointed, so that there will be no protrusions or depressions measuring more than one-half (1/2") inch from a straightedge laid in any direction parallel to the general surface. All ends shall be squared so as to form close-fitting joints. No drill holes will be permitted to show on any exposed surface.

(d) Closures shall not be less than two and one-half (2-1/2') feet in length and must not be placed adjacent to catch basins or over fresh excavations or adjacent to one another. No more than three (3) such closures will be allowed between any two fixed points such as circular curb for corners, circular curb for driveways or catch basins.

C707.05 SETTING AND RESETTING STONE CURBS:

(a) Stone curb shall be set to lines and grades indicated on plans, or as may be otherwise directed. The subgrade on which the curb base is to be placed shall be excavated and thoroughly tampered by means of a pneumatic tamper.

(b) After the curb has been set to proper line and grade as above, the contractor shall place under each curb joint, or as close thereto as may be practical, a concrete pier. These piers and concrete base shall be constructed in accordance with dimensions shown on the detail plans, care being taken that the excavation therefore made prior to the pouring of the concrete is evenly cut and as nearly true to the plans as the character of the excavation materials will permit. Care should be taken also, that all loose material is removed from the finished subgrade of the roadway prior to pouring concrete.

(c) One pier shall be provided under each curb joint except in cases where it is impractical to construct one at said point, as where a drain sewer or gas service is directly under the joint and is sufficiently high to prevent the pier being built to the dimensions shown on the plans. In this case, two (2) piers shall be constructed, one (1) on each side of the curb joint and as close thereto as practical.

(d) After setting curb, the excavated area behind same shall be backfilled by tamping and this filling shall be brought to the top of the back of the curb.

(e) Old stone curb of proper quality and dimensions will be relined and reset at its present location when required by the proposal or special specifications, or it shall be removed to other points within the limits of the project, as may be designated by the Director, and there reset.

(f) The ends of all curb, whether new or old, shall be nearly squared so as to form close-fitting joints. Joint filler one-half (1/2") inch in thickness shall be placed adjacent to catch basins and circular curbs when setting stone curbs. All joints in stone curb shall be thoroughly and neatly pointed with mortar. The joints in the precast concrete curbs shall be neatly filled with a joint filler, one-eighth (1/8") inch thick. This joint filler material shall be finished flush with the top and roadway face of the curb.

(g) When stipulated in the proposal form and special specifications, that curb shall be set in a recess in the concrete foundation of the pavement, then this shall be done only after the concrete has become thoroughly hardened. The recess shall be cleared of all foreign matter and on its bottom surface there shall be placed a bed of stiff mortar, varying from one-quarter (1/4") inch to three-quarter (3/4") inch in thickness and averaging one-half (1/2") inch in thickness depending on the irregularities in the bottom of the stone curb, or the concrete roadway foundation. When the curb stones have been so set, the recess on both sides of the curb shall be filled from top to bottom with liquid mortar. Compensation for providing the recess and for filling same with mortar after the curb has been set, shall be included in the price per linear foot bid in the proposal for curb.

(h) Cuts of proper dimensions, executed in a neat and workmanlike manner shall be made where directed and where required in both new and old curb for drain pipe or gas pipe

where required under the curb for connections. No additional compensation shall be made for such cuts.

(i) No extra compensation will be allowed for removing obstructions, gallery or shed posts, etc. that may be encountered in setting new or old curb, nor will any extra compensation be allowed for shoring or reinforcing sheds or galleries that may be necessary.

C707.06 CIRCULAR STONE CURB:

(a) Circular stone curb shall be granite, free of stratification and excess of mica, flint and feldspar. The entire top shall be peen-hammer dressed, and the face of eight (8") inches from the top and the back for four (4") inches from the top of the curb shall be neatly pointed. All edges shall be well defined. The stone shall have squared and neatly finished ends, so as to from close-fitting joints.

(b) Circular stone curb shall be of the radius indicated on plans or as otherwise specified. When the radius is two (2') feet or less, the circular curb shall be in one (1) piece; where the radius is more than two (2') feet, and not more than four (4') feet, the circular curb shall be in two (2) pieces; where the radius is more than four (4') feet, and not more than six (6') feet, the circular curb shall be in three (3) pieces; where the radius is more than six (6') feet, and not more than eight (8' feet, the circular curb shall be in four (4) pieces; where the radius is more than eight (8') feet, and not more than ten (10') feet, the circular curb shall be in five (5) pieces; and where the radius is more than ten (10') feet, and not more than twelve (12') feet, the circular curb shall be in six (6) pieces.

(c) Circular stone curb shall be twelve (12") inches in depth, five (5") inches in width at both ends, and of such widths intermediate to the ends as shown on plans.

C707.07 SETTING CIRCULAR STONE CURB:

(a) Circular curb shall be of the quality and dimensions hereinbefore prescribed for circular curb.

(b) All joints in circular stone curb shall be thoroughly and neatly jointed with mortar and such amount of lamp black added as may be necessary to make the color of the mortar correspond with the color of the stone immediately after it has been set and while it is to correct line and grade.

(c) Circular curb shall be placed on a concrete foundation four (4") inches in thickness mixed in proportion of one (1) part cement to three (3) parts fine aggregate to six (6) parts coarse aggregate.

C707.08 TIMBER CURB:

(a) Timber curb shall be laced on the lines and at the grades as shown on the drawings or as furnished by the Director, and shall be of the dimensions indicated on the plans and herein described.

(b) The face of curbs shall be set either barrier or with a batter as may be designated.

(c) Timber curb shall be formed of either creosoted No. 1 Common Pine, twelve (12 lb.) pound treatment, or treated No. Common Pine, 6 lf/cf of CCA, anchors, braces, sills and boards as shown on plans and herein described.

(d) Posts shall measure four (4") inches by four (4") inches and generally the length shall be three (3) times the depth of the finished curb measured on its surface. Posts shall generally be spaced sixe (6') foot centers apart.

(e) Boards shall be three (3") inches thick and not less than eight (8") inches wide and generally not less than sixteen (16') feet long. They shall be laid horizontal with close-fitting sides and end joints. Joints shall be broken so that boards along side of each other shall not break joints on the same posts.

(f) At such points as may be designated, cuts of proper dimensions, executed in a neat and workmanlike manner shall be made for drain pipe connections and for the proper construction of foot bridges. No direct compensation shall be made for such cuts.

C707.09 ASPHALTIC CURB: Asphaltic curb shall be placed by an approved extruding machine. Prior to placing curb, the contractor shall apply asphaltic tack coat conforming to Section C504.

C707.10 MEASUREMENT: The length of curb, gutter, and curb and gutterbottom will be established by measurements of the actual curb, gutter and curb and gutterbottom in place and no allowance will be made for waste due to closures or other causes.

Circular curb shall be measured at the top outer face.

Timber curb will be measured by the number of board feet (MFBM) including board and posts.

Joint materials, rebars, concrete bases and piers for stone curb or resetting existing curb shall not be measured for payment.

Excavation for reconstruction of curb and gutter bottom only, and excavation for setting and resetting stone curbs in rehabilitating projects shall not be measured for payment.

C707.11 PAYMENT: Payment of curb and gutterbottoms shall be made at the contract unit price per linear foot, subject to the payment adjustment provisions of Section C501 for asphaltic concrete mixtures and Section C601 for Portland cement concrete.

Payment for wood curb shall be made at the contract unit price per Thousand Board Feet (MFBM).

Payment will be made under:

ITEM NO.	PAY ITEM	PAY UNIT
C707(54)	Asphaltic Curb	Linear Foot
C707(55)	Concrete Mountable Curb with or without Dowels (Straight, Circular or Depressed)	Linear Foot
C707(56)	6" Concrete Barrier Curb with or without Dowels (Straight, Circular or Depressed)	Linear Foot
C707(57)	8" Concrete Barrier Curb with or without Dowels (Straight, Circular or Depressed)	Linear Foot
C707(58)	Concrete Gutterbottom or Rolling Strip	Linear Foot
C707(59)	Concrete Mountable Curb and Gutterbottom	Linear Foot
C707(60)	6" Concrete Barrier Curb & Gutterbottom or Rolling Strip	Linear Foot
C707(61)	8" Concrete Barrier Curb & Gutterbottom or Rolling Strip	Linear Foot
C707(62)	Stone Curb Including Base (Straight Circular or Depressed)	Linear Foot
C707(63)	Reset Existing Curb (Precast Concrete, Stone, etc.) Including Base	Linear Foot
C707(64)	Timber Curb	Thousand Board Feet (MFBM)

STATE PROJECT NO. 742-36-0110
SPECIFICATIONS FOR LANDSCAPING

SECTION C719 LANDSCAPING

Section 719 of the Standard Specifications for Roads and Bridges, 2006 Edition, shall be amended as follows:

C719.01 TREE PROTECTION: At the field plan-in-hand meeting of each project, the Department of Streets and the Parkway and Park Commission will prepare a list which will state the location of each tree by station and distance off the survey base line and what work is required at each tree location. The list will be enclosed in the project specifications.

(a) The contractor shall be responsible for damage to any City tree within the construction area and liable to the City for compensation of damage.

(b) The contractor must notify the Parkway and Park Commission, Tree Department at least three (3) working days prior to the beginning of construction.

(c) The contractor shall provide a Louisiana Licensed Arborist to perform the necessary tree trimming, root pruning, or removal of any tree or stump on City property. A current list of licensed arborists may be obtained from:

Parkway and Park Commission
Tree Department
2829 Gentilly Boulevard
New Orleans, Louisiana 70122
Phone: (504) 286-2123 or 286-2100
Fax: (504) 286-2158

(d) The licensed arborist must obtain a permit from the Parkway and Park Commission, Tree Department prior to working on any City trees.

(e) Prior to beginning construction, the contractor must complete trimming trees requiring clearance for all new construction.

(f) The attachment of signs, barricades, equipment, or materials in any manner to any tree is prohibited.

(g) Excavation within the dripline of any City tree is permitted only under existing roadbeds. All other excavation (i.e. street widening, neutral grounds, or sidewalks) within the dripline of any City tree will be inspected by the Parkway and Park Commission Tree Department prior to beginning construction.

(h) Trenching within the dripline of any City tree is not permitted. Boring or hydraulic jacking is acceptable within the dripline if performed according to the following specifications. The boring or jacking must be at minimum depth of thirty inches (30") and begin ten feet (10') from the dripline of the tree and bore directly under the center of the tree's main stem. Placement of boring pits and direction of the boring must be

approved by the Director prior to beginning construction. Under unusual conditions, the Director may approve alternative methods. Boring or jacking shall be in compliance with Section 728 "Jacked or Bored Pipe".

(i) Where tree roots interfere with placement of new curbs, delete the typical one foot (1') excavation for placement of new curbs within the driplines of any City-owned tree. Hand forming curbs within the dripline of City trees may be required at no direct pay.

(j) Where tree roots interfere with placement of new sidewalk, wherever possible ramp over roots using a minimum four-inch (4") gravel bed and filter cloth between the gravel bed over roots using a minimum four-inch (4") gravel bed and filter cloth between the gravel bed and the new concrete. If ramping is not an option, an on site inspection by the Department of Streets, Parkway and Park Commission, the contractor, and the contractor's licensed arborist will be required prior to excavating for the new sidewalk to determine the extent of root pruning necessary for construction clearance. Do not place expansion joints over roots, only use control joints.

(k) No more than two inches (2") of cut or fill is permitted within the dripline of any City -owned tree except under existing roadbeds.

(l) Storage is never permitted within the driplines of any tree. The use of neutral grounds and other City property for the storage of materials, supplies, equipment, or vehicles is permitted only with specific written authorization from the Parkway and Park Commission superintendent and the Director.

(m) The erection of barricades around the perimeter of tree driplines may be required. The contractor is responsible for maintaining the temporary barricades until completion of the project. The tree protection fencing and posts shall be removed upon Substantial Completion and become the property of the contractor. The minimum barricade requirements shall be the following:

Green painted steel posts, with at least four feet (4') above ground, three feet (3') in ground, set no more than six feet (6') on center with orange plastic safety fencing attached from top to bottom, running post to post completely encircling the tree.

(n) Tree trimming is defined as the cutting of tree branches. The Parkway and Park Commission Urban Forester will consult with the contractor and the licensed arborists to determine the extent of root trenching allowable.

(o) Root pruning is defined as the cutting or grinding of roots. The Parkway and Park Commission Urban Forester will consult with the contractor and the licensed arborist to determine the extent of root pruning allowable.

(p) Root trenching is defined as cutting of roots using a trenching machine. The Parkway and Park Commission Urban Forester will consult with the contractor and the licensed arborist to determine the extent of root trenching allowable.

(q) Root pruning and root trenching will be at no direct payment of trees less than four inch (4") caliper measured six inches (6") off the existing ground.

C719.02 MAINTENANCE OF NEUTRAL GROUNDS:

(a) The contractor is responsible for restoring the neutral ground to a like or better condition than existed prior to construction. All areas disturbed during construction shall be regarded to a smooth even surface, eliminating ruts and holes. All obstructions such as bricks, concrete, wire, cable, wood, metal, shell, gravel, and other debris must be removed. Batture sand may be used to backfill low areas to complete grading. Restoration of turf grass is covered in Section 717.

(b) The contractor is responsible for the maintenance of turf grass and other plant material on neutral grounds within the construction area.

(c) Maintenance shall commence when construction begins or when any supplies, equipment, signs, barricades, or other materials related to the construction are placed on the neutral ground, whichever comes first; and continue until Final Acceptance.

(d) Maintenance shall primarily include mowing with grass to be maintained no higher than eight inches (8") at any time.

(e) Under certain circumstances, if newly planted trees or shrubs or other existing plantings requiring maintenance during construction, are inaccessible to Parkway and Park Commission maintenance personnel and equipment for watering, weeding, trimming, or other maintenance, the contractor may be required to perform such maintenance during construction at no direct pay.

(f) The contractor shall be responsible for damage to any City-owned shrub on the neutral ground or other greenspace within the construction area and liable to the City for compensation of damage.

(g) No shrub may be removed from public greenspace without the approval of the Director.

C719.03 INSTALLATION OF NEW AND RELOCATED TREES AND SHRUBS:

(a) Removal from the construction site of trees or shrubs to be relocated shall be accomplished by the use of an appropriately sized tree spade. For trees, the tree spade must be adequate to obtain a minimum of one foot (1') of root ball diameter for each one inch (1") of tree caliper measured one foot (1') off the ground.

(b) The contractor must contact the Parkway and Park Commission Landscape Architect at least three (3) working days prior to the installation of new or relocated trees and shrubs. The Parkway and Park Commission Landscape Architect will determine and identify the planting sites for new or relocated trees and shrubs.

(c) The contractor is responsible for ensuring that all trees and shrubs are planted according to locally accepted horticultural practices, including planning hole preparation, soil backfill, fertilizer, mulch, watering, staking and guying (See Standard Plans).

(d) The contractor is responsible for maintenance of any new or relocated trees and shrubs from the time of planting until Final Acceptance of the project.

(e) Maintenance shall include all necessary watering, fertilizing, weeding, pruning, disease and insect control, straightening and adjustment, replacement of dead or unhealthy plants, and other procedures consistent with good horticultural practices which are necessary to insure normal, vigorous and healthy growth of the plant material.

C719.04 MEASUREMENT:

(a) Gravel bed and filter cloth over tree roots will be measured by square yard.

(b) Tree protect will be measured per linear foot.

(c) Tree removal will be measured per each.

(d) Tree replacement will be measured per each.

(e) Tree relocation will be measured per each.

(f) Tree trimming will be measured per each.

(g) Root pruning will be measured per each.

(h) Root trenching will be measured per each.

C719.05 PAYMENT:

Payment of items required in this project will be made at the contract unit price under:

Item S-2, Remove and Replace Tree with Crepe Myrtle, per each.

Item S-3, Tree Trimming and/or Root Pruning, per each.

Item S-40, Gravel Bed and Filter Cloth Over Tree Roots, per square yard.

(Item S-40 is a contingency bid item.)

STATE PROJECT NO. 742-36-0110
SPECIFICATIONS FOR TRAFFIC SIGNALS

SECTION C736 - TRAFFIC SIGNALS

Section 736 of the Standard Specifications for Roads and Bridges, 2006 Edition and Section C736 of the General Specifications for Street Paving, 1999 Edition (Revised 10/1/2001), City of New Orleans, Department of Public Works, shall be amended as follows:

SECTION C736 - INSTALLATION AND REPLACEMENT OF TRAFFIC SIGNALS

C736.01 GENERAL

(a.) This work consists of furnishing and installing the indicated new traffic signal at the intersection of Robert E. Lee Boulevard and Leon C. Simon Drive, and the removal and salvage of the existing traffic signal at this intersection, and other work indicated on the plans.

(b.) All traffic signal work at this intersection shall be performed according to the requirements of the City of New Orleans Department of Public Works Traffic Engineering Division, and as indicated on the following pages. All traffic signal components required at this intersection shall also conform to the requirements of the City of New Orleans Department of Public Works Traffic Engineering Division, and as indicated on the following pages.

C736.02 REGULATIONS AND CODES

(a.) STANDARD SPECIFICATIONS: Except as otherwise specifically required by the Plans or these Special Provisions, all work on this project shall fully comply with the *City of New Orleans General Specifications for Street Paving*, 1999 Edition (Revised 10/1/2001), (also referred to herein as the "General Specifications") and the *City of New Orleans Standard Plans for Street Paving*, (also referred to herein as the "Standard Plans"). Where specifically noted in these Special Provisions, materials and workmanship shall conform to the requirements of the *Louisiana Department of Transportation and Development Standard Specifications for Roads and Bridges*, 2006 Edition, (also referred to herein as the "Standard Specifications").
In the event of conflict between these Special Provisions and the General Specifications, Standard Specifications, and/or the Standard Plans, the requirements of these Special Provisions shall govern.

(b.) COMPLIANCE WITH OTHER SPECIFICATIONS AND STANDARDS: All electrical equipment shall conform to the standards of the *National Electrical Manufacturers Association (NEMA) Standards Publication TS-1, 1989* (also referred to herein as the "NEMA TS-1, 1989"), *National Electrical Manufacturers Association (NEMA) Standards Publication TS-2, 1992* (also referred to herein as the "NEMA TS-2, 1992"), the Underwriters' Laboratories, Inc. (UL), and the Electronic Industries Association (EIA), wherever applicable. All materials and workmanship shall conform to the requirements of the *Manual on Uniform Traffic Control Devices for Streets and*

Highways (MUTCD), *National Electrical Code* (NEC), *National Electrical Safety Code* (NESC), *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*, Standards of the American Society for Testing and Materials (ASTM), American National Standards Institute, Inc. (ANSI), Rural Electrification Administration (REA), International Municipal Signal Association (IMSA), and any City codes and ordinances which may apply.
Wherever reference is made to any such specification, manual, code, or standard, the reference shall be construed to mean the version, as revised, that is in effect on the date of advertising for bids on this project.

C736.03 DESCRIPTION OF WORK

(a.) GENERAL: The work to be done consists of furnishing and installing all necessary materials and equipment to complete traffic signal installations, all as shown on the Plans, standard or special details, and as set forth in these Special Provisions, at the intersection of Robert E. Lee Boulevard and Leon C. Simon Drive.
The signals, controllers and appurtenances shall be located as shown on the Plans or as directed by the Engineer.
All incidental parts which are not shown on the Plans, or specified herein, which are necessary to complete the traffic signal or other electrical systems shall be furnished and installed by the Contractor at no additional cost to the project.

(b.) INTENT OF PLANS AND SPECIFICATIONS: The Contractor shall furnish all material, equipment, supplies, labor, and incidentals required to complete fully operational traffic signal installations.
Where the Special Provisions describe portions of the work in general terms, but not in complete detail, it is understood that only the best general practice is to prevail and that only materials and workmanship of the first quality are to be used. Unless otherwise specified, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals, and do all work involved in executing the contract in a satisfactory and workmanlike manner. Unless otherwise specifically noted, the Contractor shall perform all of the work explicitly or implicitly required by the Contract Documents.
Compliance with the operational and technical specifications of these Special Provisions pertaining to individual elements of the work does not in itself constitute compliance with the requirement to provide complete, fully functional signal installations.

(c.) DESCRIPTION:

1. Field Equipment and Materials: Where the Plans call for new controller cabinet assemblies:

- The existing power service shall be reused and modified in accordance with these Special Provisions, unless otherwise indicated on the Plans or as directed by the Engineer.
- All existing controllers, cabinets, and foundations shall be removed by the Contractor. The Contractor shall install new controllers, cabinets, and foundations.

(d.) QUALITY ASSURANCE: The Contractor shall provide quality workmanship, materials and equipment and shall take precautions to protect existing facilities, which

do not require modifications.

(e.) WORKMANSHIP: The equipment, including parts and accessories, shall be installed in a workmanlike manner and in accordance with best commercial practice. Particular attention shall be given to neatness and thoroughness of soldering, wiring, welding and brazing, plating, riveting finishes, and machine operations. Parts shall be free from burrs, sharp edges or other defects that could make the part or equipment unsatisfactory for the operation or function intended.

(f.) INSPECTION: All work and materials to be performed or furnished under these specifications shall be subject to the direction and inspection of the Engineer. He and his authorized representatives shall at all times be given free access to the work or any part thereof and to any plant, yard, shop, mill or factory in which any article or material to be used or furnished in connection with the work is being prepared, fabricated or manufactured; and the Contractor shall provide every reasonable facility for obtaining sufficient information relative to performance of the work and character of materials an ascertaining that the quality of workmanship and materials is in accordance with the specifications.

The work shall be prosecuted only in the presence of the Engineer or inspector appointed by the Engineer, unless permission to do otherwise has been obtained. Inspection of the work, however, shall not relieve the Contractor of any obligation to properly fulfill his contract as prescribed; and if the work or any part thereof or any materials used in connection therewith, are found to be defective or unsuitable at any time prior to final acceptance, he will be required to forthwith make good or replace such defective or unsuitable work or material.

Application for the Engineer or his inspector in connection with work under these Special Provisions shall be made by the Contractor at least 24 hours before the services will be required.

(g.) GENERAL EQUIPMENT REQUIREMENTS:

1. General:

a. All equipment supplied under this contract shall be new.

b. All controls, indicators, and connectors shall be clearly and permanently labeled.

2. Outdoor Equipment: All conductive connectors, pins (except pins connected by soldering), and socket contacts shall be gold plated. Circuit boards shall be protected by acrylic conformal coating on each side that has conductive traces. Except for chips containing custom firmware, all components shall be soldered to the printed circuit board.

3. Custom Equipment: Equipment that is not part of the manufacturer's standard product line, or that is made or modified specifically for this project, shall conform to the following requirements:

a. Where practical, electronics shall be modular plug-in assemblies to facilitate maintenance. Such assemblies shall be keyed to prevent incorrect insertion of modules into sockets.

b. All components shall be available from multiple manufacturers as part

of the manufacturers' standard product lines. All must be clearly labeled with the value, part number, tolerance, or other information sufficient to enable a technician to order an exact replacement part.

c. Lamps used for indicator purposes shall be light-emitting diodes.

d. The printed circuit boards shall be composed of 62.2 grams of copper on 1.6 mm thick fiberglass epoxy or equivalent type construction. Holes which carry electrical connections from one side of the boards to the other shall be completely plated through. Multilayer printed circuit boards shall not be used. The name or reference number used for the board in the drawings and maintenance manuals supplied to the City shall be permanently affixed to each board.

e. All components shall be mounted so that the identifying markings are visible, if practical.

4. Environmental Conditions: Equipment shall continue to operate as specified under the following ranges of environmental conditions, except as noted in the specifications for individual pieces of equipment. Equipment in the field shall meet the temperature and humidity requirements of NEMA Standard TS-1. Liquid crystal displays shall be undamaged by temperatures as high as 74° C, and shall produce a usable display at temperatures up to 49° C.

5. Vibration and Shock: The equipment, when packaged in its normal shipping container, shall not be damaged, nor shall the operational performance be degraded after exposure to vibrations of 1g, 15 Hz to 500 Hz, or shocks of 5 g, 10 $\pm$ 1 milliseconds in each of three mutually perpendicular planes.

Camera assemblies, and any other equipment mounted atop poles or on structures shall not be impaired by the continuous vibration caused by wind and traffic.

6. Electrical Power:

a. Operating Power: The equipment shall operate on 120 Volts, 60 Hz, single-phase unless otherwise specified. It shall conform to its specified performance requirements when the input voltage varies from 89 to 135 volts and the frequency varies $\pm$ 3 Hz.

b. High Frequency Interference: The equipment operation shall be unaffected by power supply voltage spikes of up to 150 Volts in amplitude and ten microseconds duration.

c. Line Voltage Transients: The equipment operation shall be unaffected by voltage transients of plus or minus 20 percent of nominal line voltage for a maximum duration of 50 milliseconds. Equipment in the field shall meet the power service transient requirements of NEMA Standard TS-1 when connected to the surge protectors in the cabinets.

d. Protection: All equipment shall use readily accessible, manually resetable or replaceable circuit protection devices (such as circuit breakers or fuses) for equipment and power source protection.

e. Brownouts: The equipment shall not be damaged when the main power drops to 95 VAC for a period of eight hours. If the equipment does not operate

normally at 95 Volts, the equipment shall automatically resume normal operation within five seconds after normal power returns.

7. Wiring:

a. Permanently label every cable in every junction box or manhole it passes through. The labeling method(s) must be approved by the Engineer prior to use.

b. Every conductor, except a conductor contained entirely within a single piece of equipment, must terminate either in a connector or on a terminal block.

c. Permanently label and key connectors to preclude improper connection. The labeling method(s) must be approved by the Engineer prior to use.

d. Terminal blocks must be affixed to panels that permanently identify the block and what wire connects to each terminal. This may be accomplished by silk screening or by installing a laminated printed card under the terminal block, with the labels on portions of the card that extend beyond the block.

e. Protect personnel from accidental contact with all dangerous voltages.

f. Do not install conductors carrying AC power in the same wiring harness as conductors carrying DC control or communication signals.

g. Arrange wiring so that any removable assembly can be removed without disturbing wiring that is not associated with the assembly being removed.

C736.04 MILL TEST REPORTS AND CERTIFICATIONS

(a.) MILL TEST REPORTS: Mill Test Reports (MTRs) shall be required for major structural items, and shall include both physical and chemical descriptions of the materials as supplied to the fabricator. When physical properties are altered during the fabricating, MTRs covering chemical composition shall be supplemented by certified test reports indicating the physical properties of this material after fabrication. MTRs shall be required for:

- Anchor Bolts
- Manhole Covers and Frames
- Traffic Signal Poles, Mast Arms, and Pedestals
- CCTV Poles

(b.) CERTIFICATION OF CONFORMANCE TO THE SPECIFICATIONS: Certification of Conformance to the Specifications shall be required for:

- Galvanizing
- Cable and Wire
- Traffic Signs (Aluminum and Reflective Sheeting)
- Program Heads
- Traffic Signal Controllers and Cabinets

C736.05 TRAFFIC SIGNAL ITEMS – "Deleted and Replaced with Section 1404"

C736.06 TRAFFIC SIGNAL CONTROLLER ASSEMBLIES

(a.) GENERAL PROVISIONS: These specifications define the minimum acceptable design and operational standards for traffic control equipment. The equipment shall conform to the NEMA standards specified in the description under each item. If no standards are specified, the equipment shall conform, at a minimum to NEMA TS-1, 1989. In case of discrepancy between these specifications and NEMA standards, these specifications shall govern. The Contractor shall provide at least one traffic signal technician meeting International Municipal Signal Association (IMSA) Level I and Level II Traffic Signal Certification during the installation of the traffic signal controller assemblies.

(b.) TRAFFIC SIGNAL CONTROLLER:

1. General: All controllers provided shall be the same model and made by the same manufacturer. All controllers shall be compatible with the existing central control software in the Traffic Control Center at City Hall. All controllers shall comply with NEMA standards publication NTCIP 1202 v02.10 – NTCIP Object Definitions for Actuated Signal Controllers, formerly named TS3.5-1996.

This specification sets forth the minimum requirements for a 16 sixteen-phase full-actuated traffic signal controller unit with internal Time-Based-Coordination (TBC), railroad/fire/transit emergency vehicle preemption, and closed loop secondary operation.

2. System Communications: The controllers shall support the NTCIP protocol as well as manufacturer specific protocols. Laptop computers and Palm devices shall be used to upload/download the controller database, flash the controller firmware program (stored on EEPROM) and set the System Time Base of the controllers.

Auxiliary RS-232 communication may be provided by the controllers to interface the conflict monitor and temperature alert devices provided in the terminal facility as an option. The auxiliary communication port shall allow data logs from these external devices to be uploaded to the Traffic Control Center through the controllers.

3. System Time Base: The System Time Base shall use the sixty (60) Hz power line frequency as time base when AC power is present over the 89-135 VAC range defined by TS-2 §2.1.2. A super capacitor shall maintain the time-of-day clock and digital data during a power outage lasting up to 2 consecutive days. The use of batteries is unacceptable as means of compliance with this section.

The System Time Base shall be maintained to within 0.005 % at 20° C and to within a 0.02 % over the full specified operating temperature range, as compared to Coordinated Universal Time (WWV) standard for a period of thirty days, during periods when AC power is not applied.

The System Time Base shall be easily set to the year, month, day of month, day of week, hour, minute, and second. The controllers shall adjust the system time base for US Daylight Savings Time without operator intervention. A parameter shall be provided to enable or disable Daylight Savings as required by NTCIP.

The controllers shall perform an automatic calendar adjustment for leap year.

4. Coordination: NTCIP based coordination shall be based on a pattern having a fixed cycle length and a designated coordination phase used to reference the

pattern offset to a system time reference. It shall provide a minimum of 48 patterns each defined in the pattern table by an individual cycle length and offset (in seconds), a split table index and a phase sequence index.
NTCIP based coordination shall provide a minimum of 24 individual split tables referenced by index 1-24 in the pattern table. Each split table shall designate split times (in seconds) for each of the 16 phases and allow any phase to be programmed as a coordinated phase. A phase omit or recall (min, max, ped or ped+max) may be applied to any phase in the split table overriding the normal recall mode of the phase when the pattern is in effect.
Coordination Diagnostics shall be provided to insure that the sum of the split times in each active ring equals the programmed cycle length. In addition, the coordination diagnostic shall insure that the split times provided are adequate to service the minimum vehicle and pedestrian times programmed for each phase. The coordination diagnostic shall also insure that the sum of the split times on the same side of the barrier in each ring are equal.
Each Actuated Signal Controller (ASC) shall provide a manual pattern override mode via keyboard entry to override the active pattern and any future pattern called by the Time Base Scheduler or closed loop system.

5. Preemption: The internal preemptor supplied shall be user programmable for priority preemption in the minimum sequences outlined in the following order: railroad (2 train sequence), emergency vehicle (4 high priority sequences), and bus/transit (4 low priority sequences). Each preemption sequence shall have separate timing intervals. A decoded input to the controller shall be provided to discriminate the priority level. A steady state low level input is defined as a high priority signal, and a pulsing low level input is defined as a low priority signal.
Phases shall be selectable such that a limited signal sequence may be operational during preempt (PE). It shall be possible to add phases to this special limited sequence, which is not in the intersection sequence, without needing to add external logic.
Preempt sequences shall be selectable using external inputs. Preempt priority shall be assigned with #1 being the highest. If a higher priority preempt input is received during a preempt sequence, the controller unit shall immediately transition to the new sequence, subject to the constraints of PE Minimum Green and PE Minimum Walk. Provisions shall be made to clear two conflicting track phases from a single preempt input. This may be provided by two track clearance phases for a single preempt, or by combining two preempts.
Preempt 1 shall be reserved for a priority railroad preempt. If more than two preempts are provided, it shall be possible to delete the priority override for all but the railroad preempt. If a lower priority preempt is activated during another preempt cycle, the one in progress shall continue through its entire cycle. If the second preempt input is still active when the first one is completed, the controller unit shall then initiate the low priority preempt.

(c.) CONFLICT MONITOR:

1. General: All conflict monitors provided shall be the same model and made by the same manufacturer. The conflict monitors shall be compatible with all

controllers supplied as part of this project.

a. The conflict monitor shall meet the standards of NEMA Standard Publications TS1-1989, Section 6 for 12 channel types. The monitor shall also meet all environmental and transient specifications of NEMA TS1-1989, Section 2. A Type 12 conflict monitor having 12 fully programmable input channels shall be provided.

b. The conflict monitor will include the communications protocol to send messages through the controller supplied as part of this project via an RS232 port located on the front panel of the unit to the Traffic Control Center in City Hall. These reports shall be accessible through a report generation screen and also be capable of being printed from the system for maintenance information.

c. Each monitor shall have a back lighted LCD display provided to indicate continuously when a channel is active due to green, yellow, red or walk inputs. It shall also continue to display the channels, which were active at the time of a conflict, until the conflict monitor is manually reset. If the conflict was caused by a loss of red, the display array shall indicate loss of red. If the conflict was caused by the voltage monitor, the display array shall indicate a voltage error.

d. The monitor shall conflict on multiple indications within each phase (green-yellow, green-red, and red-yellow). The display shall show which indication caused the conflict.

e. The monitor shall store a minimum of twenty (20) failures and thirty (30) power condition changes stamped by day, date, and time.

2. Communications:

a. The conflict monitor shall generate a report that can be accessed from a central software package for each of the following items:

- The configuration of the programming card.
- The channels, which have the NEMA plus features, enabled.
- A listing of the phases which are monitored for short yellow times.
- Additionally, the conflict monitor shall store and report at least the last (20) twenty failures containing the information listed above when interrogated directly via the portable download/upload unit.

(d.) LOAD SWITCHES: The controller assembly shall be provided with the number of signal load switches as required to provide the phases required by the Plans and these Special Provisions. Load switches shall be jack-mounted solid state NEMA triple signal load switches.

(e.) FLASHERS: The controller assembly shall be provided with a solid state NEMA two circuit flasher with the major street indications being connected to one circuit and the minor street indications being connected to the other circuit.

(f.) CONTROLLER CABINET:

1. General: The controller and all associated equipment shall be provided in a weatherproof metal cabinet of clean-cut design and appearance. All exposed edges shall be free of burs and pit marks. Controller cabinets shall be identical and be provided by the same manufacturer as the controller. All cabinets shall be base

mounted on new foundations.

2. Construction Materials: The cabinet shall be constructed of ASTM Designation B-209 sheet aluminum alloy 5052, with a minimum thickness of three mm. The cabinet shall have a smooth natural aluminum finish. Handles and locks shall be rustproof.

3. Welds: All welds shall be neatly formed and free of cracks, blow holes, and other irregularities. All welds shall be made by the Heliarc welding method. Welds on the exterior faces of the cabinet shall be reduced to a minimum.

4. Door: A hinged door shall be provided permitting complete access to the interior of the cabinet. The door shall be equipped with a closed cell neoprene gasket at least 6.35 mm thick permanently bonded to the metal. Coat the mating surface of the gasket with a silicone lubricant to prevent it from sticking to the mating metal surface. The door shall be provided with a brass or stainless steel lock utilizing a Corbin No. 2 key that is removable in the locked position only. The Contractor need not provide any new keys with the cabinets. The locking mechanism shall secure the door to the cabinet at three (3) points.

5. Auxiliary Door: A small hinged and gasketed "door in door" shall be included on the outside of the main cabinet door. The auxiliary door shall not allow access to the controller, its associated equipment, or exposed electrical terminals but shall allow access to a small panel and compartment containing switches and/or jacks as follows;

a. A signal shut-down switch
b. A flash control switch
c. An auto-manual switch and jack-mounted push-button for manual operation

The auxiliary door shall be equipped with a strong lock utilizing keys of a skeleton key design.

6. Door Stop: The main cabinet door shall be equipped with a stop and catch arrangement to hold the door open at angles of 90 degrees, 135 degrees and 180 degrees, +/- 10 degrees. The door stop shall be constructed of metal and shall withstand the force of a 50 km/h wind force.

7. Mounting Shelves: The cabinet shall contain strong mounting shelf or shelves to accommodate controller unit and all required auxiliary devices. The cabinet facility shall permit the controller and/or auxiliary devices to be withdrawn from the cabinet for inspection or maintenance without breaking any electrical connection or interrupting operation of the controller.

8. Mounting Hardware: Screws and/or bolts used for mounting shelves or other auxiliary devices shall not protrude beyond the outside wall of the cabinet.

9. Manufacturer's Identification: The manufacturers' name shall not appear on the outside of the cabinet, but shall appear on the inside of the cabinet door, with the year and month of manufacture. This may be done by a plate welded to the door, by a moisture resistant label or other approved methods.

10. Size: All cabinets shall be the same size. Cabinets shall have a minimum internal dimension of 1350 mm high, 960 mm wide and 660 mm deep. In all cases, the cabinet shall be of adequate size to properly house all required equipment such as controller, conflict monitor, detectors, etc. intended to be contained therein; all in an upright position with a clearance of at least 75 mm from the vent, fan and filter to allow for proper air flow. In no case shall more than 70 percent of the cabinet space be used. There shall be at least 50 mm of clearance on each side of the shelf between the equipment and side walls of the cabinet.

11. Mounting: The cabinet shall be fabricated for mounting on a concrete foundation. An anchor bolt template, galvanized anchor bolts, nuts and hardware required for base mounting shall be furnished with each cabinet.

12. Ventilation: The cabinet shall contain suitable designed rain-tight vents in the door of the cabinet. The vents shall allow the release of excessive heat and any gases, which may enter the cabinet.

A removable dust filter shall be mounted on the inside of the main door completely covering the intake vent. The cabinet air filter shall be a disposable, standard size household air conditioning filter and its minimum area shall be 0.20 square meters. Positive retainment shall be provided on all sides to prevent warpage of the filter and to prevent the entry of foreign matter around the edges.

All cabinets shall have a thermostat controlled vent fan. The thermostat controlling the fan shall be manually adjustable to turn on between 40 degrees and 70 degrees Celsius with a differential of not more than 10 degrees between automatic turn-on and turn-off.

The fan shall have a minimum capacity of at least three cubic meters per minute and be located with respect to the vent holes so as to direct the bulk of the air flow over the controller and auxiliary devices.

13. Electrical Requirements: The cabinet shall have connecting cables for all electrical connections from the controller, conflict monitor and other auxiliary devices to outgoing and incoming circuits and shall be made in a manner such that each unit or device can be replaced with a similar unit or device without the necessity of disconnecting and reconnecting individual wires leading there from.

Connecting cables shall be installed in the cabinet in the amount necessary to provide electrical connection to all controller and/or auxiliary device input and output functions for the required specific intersection signal sequence and controller operation.

Each connecting cable shall contain individual wires with a minimum size of No. 22 AWG leading from pins in its connector to terminals mounted in the cabinet to provide electrical continuity for every designated input, output and spare function pin in its associated controller or auxiliary device connector.

The connector on each connecting cable shall be keyed, sized or otherwise constructed where it may be connected only to the proper controller or auxiliary device connector and shall be clearly marked to indicate its function.

Each connecting cable shall be installed in the cabinet in a neat workmanlike manner. Individual connecting cables and internal cabinet wiring with a minimum size of No. 22 AWG shall be bundled together neatly and attached firmly in place.

14. Terminals: As a minimum, wiring terminals arranged within the cabinet so

that they will facilitate the connection of incoming and outgoing conductors shall be provided with adequate electrical clearance between terminals, and clearly marked for the following:

a. Magnetic circuit breakers and integral power line switches for incoming power lines.

b. The unfused neutral side of the incoming power line.

c. AC power connection for signal displays and is able to accommodate up to 8 No. 12 AWG wire size.

d. Termination of connecting cables internal wiring for all controller and auxiliary devices inputs and outputs.

Terminal blocks shall be the barrier type with a sealed back. They shall be rated for 20 amps and 600 VAC. The terminal screws shall be nickel-plated brass eight mm long with screw inserts of the same material. Clearly and permanently label each terminal on a contiguous surface using silk screening or other approved method.

Arrange the equipment and terminal blocks within the cabinet so that they do not interfere with the entrance, tracing, and connection of conductors or communications cable. All conductors entering the cabinet shall terminate on terminal blocks. Neatly arrange all conductors and communications cables in the cabinet and bundle them in groups with cable ties.

15. Signal Circuit Polarity: Outgoing signal circuits shall be of the same polarity as the line side of the power service, and the common return shall be of the same polarity as the grounded side of the power service.

16. Grounding Bus: A grounding bus or buses shall be provided and shall be bonded to the cabinet in an approved manner. Multiple buses shall be interconnected by a minimum size No. 10 AWG solid copper wire.

17. Surge Protection: As described in Section 1412.

18. Convenience Outlet: A duplex outlet with ground safety interference shall be provided. Internal cabinet wiring shall permit power to be disconnected from the controller and auxiliary devices while maintaining power to the convenience outlet.

19. Cabinet Light: A light shall be mounted in the top of the cabinet, which will illuminate controller, auxiliary devices and wiring panels. The light shall be a minimum 20 watt fluorescent fixture. A door switch shall be provided which turns off the light when the main cabinet door is closed. The door switch shall be monitored by the controller, so that an operator at the TCC can determine the position of the door. Internal cabinet wiring shall permit power to be disconnected from the controller and auxiliary devices while maintaining power to the cabinet light.

20. Service Switches: Service switches shall be located on the inside of the main cabinet door and labeled as follows:

a. Signal Power: When in the OFF position all power to all signal heads shall be removed.

b. Flash: When in the ON position the intersection shall be in flashing operation with AC power being removed from the load switches only.

c. Cabinet Power: When in the OFF position all AC power shall be removed from all cabinet circuits except the convenience outlet and cabinet light.

d. Controller Power: When in the OFF position AC power shall be removed from the controller only.

21. Stop Time: When in the ON position the controller shall stop and the intersections shall be in flashing operation.

22. Detector: A three position switch shall be provided for each phase with the center position being the OFF position, the "UP" position being a positive contact for input of a constant call and the "DOWN" position being a spring loaded contact for input of a momentary call.

(g.) SIGNAL SERVICE: The installation of electrical service to traffic signal controllers shall meet the requirements of Section 736.05 of the Standard Specifications, with the following additions: The Contractor shall be responsible for the installation of new electrical power service facilities at locations shown in the Plans. At locations where no new power service is shown, the Contractor shall be responsible for extending the existing power service to the new service location. If the existing power cable does not reach the new cabinet location, the Contractor shall install new power cable from the power service point to the cabinet's power service panel. The new power service cable shall meet the requirements of Section 1406.02. The Contractor shall coordinate all power service work with Entergy. Meter pans for electrical services shall be 2.1 meters from center of meter pan to the ground. New power service installations shall include all materials, labor and equipment including conduit, risers, cable, meter pan, circuit breakers and incidental hardware required to complete the installation and provide power to the cabinet. No separate payment will be made for the extension of existing power service to the new cabinet location.

(h.) INSTALLATION: The Contractor shall install existing signal timing in the controllers. The City will provide existing timing on a 90 mm (3.5") MS-DOS compatible diskette in the form of a spreadsheet. Before installation in the field, controllers shall be shop tested as follows: The entire traffic signal controller assembly, including the cabinet, shall be set up in the Signal Shop, at 2832 Lafitte Street. A simulated load shall be applied to the field circuits and the controllers will be run for a minimum of 72 hours. The Engineer shall be afforded the opportunity to witness the test. Once the controller assembly has passed the shop test, it may be placed in the field.

The Contractor will be required to have suitable technical personnel to assure that detectors, interconnect and field wiring are properly connected according to manufacturer's recommendations. The intersection shall not be put into operation without the approval of the City.

At locations shown in the Plans, the Contractor shall remove existing controllers, cabinets, and foundations and install new controllers, cabinets, and foundations. The Contractor shall prepare a change out plan for each location, for approval by the Engineer, which shall describe in detail the procedures the Contractor will use to install the new cabinet assembly, including the temporary control of the signals or other method of controlling the intersection. The plan shall also include the orientation of the cabinet on the foundation and shall provide clearance swing lines for the cabinet doors.

12

Two methods of cabinet change over shall be used, as indicated in the Plans. The first method involves the installation of the new cabinet in the existing cabinet location, and the second involves the installation of the new cabinet adjacent to the existing cabinet location. While the intersection is out of service, the Contractor shall install the new intersection wiring, and connect to the terminals in the new cabinet. Existing intersection wiring shall not be connected to the new controller, and new intersection wiring shall not be connected to the existing controller.

1. New Cabinet Adjacent to Existing Location (Type B): For this change over method, the Contractor shall mark the location of the new cabinet foundation in the field, and have it approved by the Engineer before beginning the change over procedure. The Contractor shall install the new foundation, cabinet, and controller. The Contractor shall then remove the intersection from operation, and excavate around the existing foundation to expose all existing conduits entering the cabinet. The Contractor shall carefully cut the existing conduits, remove cables from their terminals, and then remove the existing cabinet and foundation. The Contractor shall install a traffic manhole in the pit of the removed foundation, and shall extend the existing conduits into the manhole. The Contractor shall then install conduits as required between the manhole and the new cabinet.

C736.07 CONDUIT

(a.) GENERAL: All underground conduit shall be polyvinyl chloride (PVC) conduit, except where otherwise directed by the Engineer. Short extensions to existing metallic conduit may be required as directed by the Engineer, in which case metal conduit shall be used.

The ends of all conduits, whether shop or field cut, shall be reamed to remove all burrs and rough edges. Cuts shall be made square and true so that the conduits butt or come together for their full circumference.

(b.) PVC CONDUIT: The Contractor shall install PVC conduit of the type, size and at locations shown on the Plans. PVC conduit shall be Schedule 40, and shall meet the latest requirements of NEMA TC-2. Conduit shall come equipped with termination fittings at all ends, and shall be installed so that cable may be readily pulled into it without damage.

(c.) MANHOLES: Manholes shall be installed at locations shown on the Plans or as directed by the Engineer. The Contractor may install additional manholes with the approval of the Engineer at no additional compensation.

The bottom of the manhole shall rest firmly on aggregate bedding with a minimum depth of 30 mm at the bottom and extending 150 mm from the outside edge of manhole, unless otherwise specified by the Engineer. Bedding shall conform to Section 726 of the Standard Specifications.

Below ground, backfill shall be compacted to the approximate density of the surrounding soil. Above ground, the material shall be compacted to 95 percent of maximum density. Maximum density shall be determined in accordance with DOTD Designation TR 418 and the in-place density determined by DOTD TR 401.

Manholes shall be reinforced concrete and shall be constructed in accordance with

ASTM Designation C 76.
A cast iron frame and cover of dimensions shown in the Plans shall be installed in each manhole. Castings shall be Class 30 and shall conform to Section 1013.06 of the Standard Specifications. Covers shall have a bossed or ribbed top surface of 6 mm in relief. Notches shall be provided for removing the cover. The word "TRAFFIC" shall be three mm in relief as indicated on the Plans. Covers shall be level with the pavement or with the curb or sidewalk grade, or with surrounding ground, as required.
Frames shall have a minimum weight of 80 kilograms. Covers shall be of the "Extra Heavy" type with a minimum weight of 65 kilograms.

(d.) CONDUIT INSTALLATION: In accordance with Section 736.17 of the Standard Specifications with the following additions and exceptions:
Where two or more conduits are to be installed in the same trench, impact-resistant plastic spacers shall be utilized. The spacers shall be installed a maximum of 2.4 meters on centers, and shall provide a separation between conduits equal to at least 65 percent of the diameter of the conduit.
Immediately prior to the installation of cables, all conduit runs longer than 10 meters, including existing conduits which are to be utilized, shall be carefully rodded, swabbed, or otherwise cleaned to insure that the interior is free and clear of all obstructions. After the conduit has been cleaned, each conduit shall be gauged by pulling through a metal ball of a diameter not less than 85 percent of the nominal inside diameter of the conduit, to ascertain that the conduit is free of any obstruction or foreign material. If the ball fails to pass through the conduit, the defective conduit shall be repaired or replaced without additional compensation (Contractor-installed conduit), or at bid unit prices (existing conduit).
Conduit bends and elbows made in the field shall have a radius of not less than nine times the inside diameter of the conduit and all such bends shall be made without crimping, denting or otherwise damaging the conduit. No field bends will be allowed for multiduct conduit. Field bends shall be made with an industry-accepted flameless heater designed to distribute heat evenly over the section of conduit being bent. Internal supports shall be provided to prevent deforming of the conduit during the bending. Manufactured bends and elbows of identical material to the conduit may also be used. Any bends in conduit other than the 90-degree bend into a foundation or as shown on the Plans shall require the prior approval of the Engineer.

1. Trenching and Backfilling: Excavations for the installation of conduit shall be performed in such a manner as to cause the least damage to streets, sidewalks and other facilities. Excavation shall not be performed until immediately before installation of conduit. Material from the excavation shall be so placed as to cause the least disruption and obstruction to traffic and the least interference with surface drainage.

2. Conduit Installed Under Roadway: Where conduit is to be installed under existing roadways or sidewalks, it shall be jacked or bored unless impossible to do so because of obstructions. In the event that obstructions are encountered during the course of jacking or boring, permission shall be obtained to make earth excavations for test pits to clear the obstruction. A minimum of two attempts shall be made to install conduit by the jacking or boring method and if unsuccessful, a final attempt shall be made changing the procedure and location (both horizontal and vertical), and if the final

attempt fails, then permission may be given for the open cut method. Open cut installation in roadways shall only be performed with prior written approval from the Engineer.

When roadways are cut to install underground conduit, the cuts shall be restored to within 150 mm of the surface using high early strength concrete. Backfill in the remaining trench shall conform to the materials composition of the existing pavement. The outline of areas to be excavated shall be saw cut to a minimum depth of 51 mm prior to excavation. Cuts shall be neat and true with no shatter outside the removal area. The Contractor shall schedule the work so that each cut shall be restored properly, and that portion of the roadway shall be usable the following day. The width of cut shall not exceed 200 mm.

3. Conduit Installed In Existing Facilities: At locations shown on the Plans, the Contractor is required to install new conduits in existing junction boxes, manholes, or pole foundations. At these locations, the Contractor shall modify the existing junction box, manhole, or pole foundation to allow the new conduit sweep(s) to enter the foundations as follows:

a. Remove concrete by cutting, chiseling or any other method approved by the Engineer as required to install new conduit sweeps without damage to existing conduit(s). The Contractor shall repair any damage incurred at no cost to the project.

b. After removing concrete, the area shall be washed with pressurized water at a minimum of 3,400 kPa and then thoroughly dried with compressed air.

c. Position new conduit sweeps, and apply an approved concrete bonding compound on the exposed concrete surfaces as recommended by the manufacturer.

d. Forms shall be positioned so that the profile of the existing foundation above grade will be matched.

e. Foundations shall be restored to their original dimensions, by the use of a high strength grout.

If there are sufficient existing empty conduit sweeps available, it will not be necessary to modify the foundation. It shall be the Contractor's responsibility to obtain the Engineer's approval to use the existing sweeps.

4. Conduit Connections: Rigid metallic conduit connections shall be accomplished using a threaded coupling of the proper size. Threads shall be clean cut, straight and true, and of sufficient length to permit proper coupling. A waterproofing compound shall be applied to each joint. Long running threads will not be permitted on any part of the work. Threads shall be protected in transit and during installation, and conduit shall be provided with proper supports and protection during construction to prevent damage. All ends of pipe installed for future connections shall be properly threaded, reamed and capped.

Where PVC conduit is to be connected to rigid metallic conduit or other existing conduit, a suitable manufactured adapter shall be used.

5. Conduit Termination: Conduit terminating in controller cabinet foundations, pedestal bases, mast arm bases, manholes, and/or junction boxes shall be sealed with duct seal. Immediately after conduit installation, conduit outlets shall be temporarily capped to prevent water, earth and other foreign matter from entering the duct before being used.

Conduits terminating in controller cabinet foundations shall extend a minimum of 75 mm above the foundation. Conduits entering junction boxes from the bottom shall terminate not less than 75 mm, nor more than 100 mm, above the bottom of the box and near the box walls to leave the major portion of the box clear.

For conduit runs that terminate in pole bases, there shall be a separate outlet for each run of conduit entering the pole base. Conduit shall enter pole bases from the bottom or side and shall terminate in the center of the top of the foundation. Conduits terminating in pole bases shall extend approximately 38 mm above the foundation and shall be sloped toward the handhole opening. Conduits shall enter concrete manholes from the side and shall terminate flush with inside wall to leave the major portion of the manhole clear. Bell ends shall be used at conduit entrances to manholes and junction boxes.

C736.08 PAINTING AND SURFACE FINISHING

(a.) General: The Contractor shall be responsible for preparing and finishing all signal hardware surfaces installed under this Contract. The Contractor shall furnish the Engineer with a list of items to be painted, and no painting shall begin until this list is approved. All painting operations shall be conducted in accordance with the requirements of Section 811 of the Standard Specifications. Painting will be considered incidental and no separate payment will be made.

The Contractor shall be responsible for preparing and finishing all metal parts, fittings, pedestals, and mast arms associated with standard signal installations. The surface finish for these installations includes a combination coating of hot dip galvanizing and powder topcoat. The Contractor shall furnish the Engineer with a list of items to be hot dip galvanized and powder coated, and no ordering of equipment shall begin until this list is approved. All combination coating operations shall be conducted in accordance with this Special Provision and will be considered incidental and no separate payment will be made.

(b.) Type of Paint: These specifications are not intended to prohibit the use of paints of similar character but different composition. Substitute products must be equal to specified paints for all qualitative requirements applicable to their use. Substitute products must be approved by the Engineer. The approval of a product shall not relieve the Contractor of his obligations outlined in these specifications. Type of paint to be used shall be as follows:

1. Primers:

a. Chromate aluminum oxide coating process: Shall meet Government Specifications MIL-C-5541

b. Epan Oxide Baking Primer: Shall meet Federal Specifications (FS) TT-P- 636.

c. Zinc Chromate Primer: Shall meet FS P-735.

d. Red Lead: Shall meet FS TT-P-86.

e. Iron Oxide: Shall meet FS TT-P-36.

2. Enamels: Gloss (Green): Shall be high gloss alkyd enamel for exterior use and shall meet FS TT-C-595 Color No.14036. Color shall be standard Black Green by Spraylat Corporation, Product No. PRL96012, Control No. R8131. Color chips shall be furnished for approval before painting operations begin.

(c.) Application: The preparation for finishing of new equipment shall be as follows:

1. Standards, posts, pedestals and any other galvanized surfaces to be painted shall be cleaned and coated with the approved primer best suited for the surface. The traffic signal cabinets shall not be painted.

2. If approved prime coat has been applied by the supplier, other than for repairs, prime coat will not be required.

3. Standards and posts shall have at least two coats of Traffic Paint applied as follows:

a. Standards with bracket mounted signals shall be painted in their entirety.

b. All signal heads, signal head mountings, outside of hoods, back of back plates and housing shall have one or more coats of primer followed by two coats of Traffic Green Enamel.

c. Louvers as specified, interior of signal hoods and fronts of back plates shall have one or more coats of primer followed by two coats of Lusterless Black Enamel. Factory enameled equipment and materials shall be examined for damaged paint after installation, and such damaged surfaces shall be repainted to the satisfaction of the Engineer. Factory-applied enamel finish in good condition and of appropriate color will be acceptable.

4. Blast cleaning of galvanized metal surfaces in good condition, as determined by the Engineer, will not be permitted.

(d.) Combination Coating - Galvanized/Powder Top Coat: The preparation for finishing standard signal equipment shall be as follows:

1. Surface Preparation: Prior to being incorporated into an assembled product, steel plates 18.75 mm or more in thickness shall be blast cleaned when required to remove rolled-in mill scale, impurities and non-metallic foreign materials. After assembly, all weld flux shall be mechanically removed. The iron or steel product shall be degreased by immersion in an agitated 4.5% - 6% concentrated caustic solution elevated to a temperature ranging from 65 to 88 degrees Celsius. It shall then be pickled by immersion in a heated sulfuric acid solution of 6% - 13% concentration, with a controlled temperature between 65 to 88 degrees Celsius. It shall next be rinsed clean from any residual effects of the caustic or acid solutions by immersion in a circulating fresh water bath. Final preparation shall be accomplished by immersion in a concentrated zinc ammonium chloride flux solution heated to 54 degrees Celsius. The

solution's acidity content shall be maintained between 4.5 - 5.0 pH. The assembly shall be air dried to remove any moisture remaining in the flux coat and/or trapped within the product.

2. Zinc Coating: The product shall be hot-dip galvanized to the requirements of either ASTM A123 (fabricated products) or ASTM A153 (hardware items) by immersion in a molten bath of prime western grade zinc between 432 - 454 degrees Celsius. The entire product shall be totally immersed with no part of it protruding out of the zinc (no double dipping). This is to limit a risk of trapped contaminates containing chlorides and reduce the risk of bare spots (bare spots can occur when flux on the steel surface is burned away by heat of the first dip). Maximum aluminum content of the bath shall be 0.01%. Flux ash shall be skimmed from the bath surface prior to immersion and extraction of the product to assure a debris-free zinc coating.

3. Exterior Coating: All galvanized exterior surfaces shall be coated with a Urethane or Triglycidyl Isocyanurate (TGIC) Polyester Powder to a minimum film thickness of 2.0 mils. Prior to application, the surfaces to be powder coated shall be mechanically etched by brush blasting (Ref. SSPC-SP7) and the zinc coated substrate preheated to 232 degrees Celsius for a minimum of one hour in a gas fired convection oven. The coating shall be electrostatically applied and cured in a gas fired convection oven by heating the zinc coated substrate to a minimum of 176 degrees Celsius and a maximum of 204 degrees Celsius. The thermosetting powder resin shall provide both intercoat as well as substrate fusion adhesion that meets 5A or 5B classifications of ASTM D3359.

Packaging: Prior to shipment, small poles shall be wrapped in 5 mm thick ultraviolet inhibiting plastic backed foam. Larger poles shall be cradled in 25 mm rubberized foam base.

C736.09 EMERGENCY VEHICLE PREEMPTION SYSTEM

(a.) SYSTEM DESCRIPTION:

At locations shown on the Plans, the Contractor shall install optically activated emergency preemption equipment. The Contractor shall install single-channel optical detectors, phase selectors, and preemption lead-in cables. All equipment provided by the Contractor shall provide all the features and functionality of, and be fully compatible and interface with, the following existing City preemption equipment:

TOMAR Model 2090-SD Optical Preemption Detector
TOMAR Model 2080 Optical Signal Processor
TOMAR Model 1860 Preemption Emitter System

Phase selectors shall have the capability to upload log information to the TCC through the controller using the communications network described in these Special Provisions. No additional communications channels, other than those used for controller communications, shall be required.

(b.) SURGE PROTECTION:

1. GENERAL: The placement of equipment and cabinet wiring shall be arranged so that the distance between each conductor's point of entry and the protector

shall be as short as possible, and the protector shall be located as far as possible from electronic equipment. All wiring between the surge protectors and the point of entry shall be free from sharp bends. Surge protection will not be measured for separate payment.

2. SURGE PROTECTORS:

a. General: All ungrounded conductor wires entering or leaving any controller cabinet or camera housing shall be equipped with surge protectors, suitable for protection of electrical systems operating at 600 volts and less, and in accordance with these Special Provisions. By definition, the term Surge Protectors describes the equipment necessary for the protection of all AC electrical circuits, twisted pair, and coaxial communications circuits from the effects of lightning induced voltages, utility switching transients, and internally generated transients.

Surge protectors shall be grounded to the ground rod serving the controller cabinet or to the cabinet wall.

Surge protectors shall be provided for the following types of conductors and cables: low-voltage signal pairs; loop and microwave detector leads; cables carrying unswitched power; 120-volt electric power lines; and cables carrying video signals.

Surge protectors shall meet the following general requirements:

1). Maximum continuous operating voltages must not be less than 115 percent of the nominal system operating voltage.

2). All surge protectors must be UL 1449 listed and bear the UL label.

3). All metal oxide varistors used for surge protection shall be 20 mm in diameter or larger and shall be rated in the appropriate voltages.

b. Low-voltage Signal Pairs shall be protected by two-stage, plug-in surge protectors. The protectors shall meet or exceed the following minimum requirements:

1). The protectors shall suppress a peak surge current of up to 10K amps.

2). The protectors shall have a response time less than five (5) nanoseconds.

3). The protector shall clamp the voltage between the two wires at eight (8) volts, and clamp the voltage between each wire and ground at 50 volts.

4). The first stage of protection shall be a three-element gas discharge tube, and the second stage shall consist of silicon clamping devices.

5). There shall be no more than two pairs per protector.

6). It shall be possible to replace the protector without using tools.

c. Loop and Microwave Detector Leads shall be protected by a semiconductor array protector that meets or exceeds the following minimum requirements:

1). Continue operations after a peak surge current of up to 400 amps in the differential mode and 1000 amps in the common mode.

2). Operate with a response time of 40 nanoseconds.

3). Clamp the voltage between the two detector leads at 30 volts, and clamp the voltage between each lead and ground at 30 volts.

d. 120-volt Electric Power Lines shall be protected by a filtering, two-stage surge protector. The protector shall be installed on the load side of the cabinet main circuit breaker. The two stages shall be electrically separate, so that the first stage protects all equipment using the power, while both the first and second stages protect electronic equipment. There shall be no maximum load for the first stage. The second stage shall be capable of protecting equipment drawing a total of 10 amps. The protector shall clamp both the main line and the main neutral at 250 volts. The surge protector shall meet or exceed the following minimum characteristics:

1). The protector shall accommodate a continuous service current of up to 10 amps at 120 VAC and 60 Hz.

2). The protector shall suppress surges of up to 20,000 amps.

3). The clamp voltage shall be 250 volts at 20 KA.

4). The voltage during a surge shall never exceed 250 volts.

A radio interference filter shall also be provided on the power line. The filter shall be wired in series between the main cabinet circuit breaker and the power input to the controller and auxiliary devices. The filter shall provide a minimum attenuation of 40 dB over a frequency range of 20 kHz to 60 mHz and shall be hermetically sealed in a metal case. The current rating of the filter shall meet or exceed the rating of the main cabinet circuit breaker.

e. Conductors Carrying Unswitched 120 Volt Power From a Cabinet to a Camera Enclosure shall be protected by a surge protector as recommended or provided by the manufacturer of the camera housing.

f. Cables Carrying Video Signals shall be equipped with surge protectors that shall meet or exceed the following minimum characteristics:

1). The clamping voltage shall be 11 volts between the shield and center conductor signal line.

2). The response time shall be five (5) nanoseconds or less.

3). Bipolar silicon avalanche diode technology shall be used in a single stage device.

4). The module shall dissipate a minimum of 50 Joules.

5). The module shall have BNC connectors.

6). The module shall pass signals from DC to 80 MHZ with less than 2 dB insertion losses.

3. BONDING AND GROUNDING: All communications cable shields shall be bonded at all designated termination points. The grounding or bonding conductor shall be an insulated #6 AWG copper wire, unless otherwise indicated in the Plans. The shield system shall be entirely insulated except at the ground rod. No other devices shall be bonded to the shield system or its ground rod. Only the shield of the outgoing communications cable shall be grounded at each cabinet. The shield of the incoming

communications cable shall be left ungrounded or "floating". Extra care shall be taken so that the shield of the incoming cable does not does touch the walls of the cabinet, forming a ground loop.

All conduit, controller cabinets, CCTV cabinets, anchor bolts, reinforcing bar cages, and metal poles and pedestals shall be made mechanically and electrically secure to form a continuous system and shall be effectively grounded. The grounding or bonding conductor shall be #6 AWG bare copper wire, unless otherwise shown in the Plans.

Ground electrodes shall be 1-piece lengths of copper weld ground rod not less than three (3) meters in length and six (6) mm diameter, except where noted, installed in accordance with the NEC. Grounding of conduit and neutral shall be accomplished as required under the NEC except that grounding conductors shall be #6 AWG, unless otherwise indicated in the Plans. Exposed ground conductors shall be enclosed in 12 mm diameter conduit and shall be bonded to the ground electrode with a copper ground clamp.

Each camera and its housing shall be electrically bonded to the mounting bracket by copper braided wires equivalent to #6 AWG conductor with aluminum crimped connectors and grounding star washers. The mounting bracket, in turn, shall be electrically bonded to the metal pole, and the pole to the grounding rod.

All poles shall be connected to earth ground using exothermic welds.

The ground system resistance-to-ground shall be measured as soon as the installation is completed, and shall not be higher than 20 percent more than the objective value of 25 ohms. The resistance-to-ground shall be measured by a ground tester using either the "Fall of Potential/Three-Point Measurement Method" or the "Empirical 62% Method." If the measured resistance is greater, the ground system shall be enhanced by installing additional ground rods or by using ground treatment methods that are permanent, environmentally safe, moisture-independent, and non-corrosive. Ground treatment containing metallic salts is not acceptable. The measured ground resistance shall be recorded and reported to the Engineer.

4. TESTING

a. GENERAL: Testing of all equipment, cable and software furnished and installed under this Contract shall be the responsibility of the Contractor and shall be conducted in the presence of the Engineer. The City reserves the right to perform any inspections deemed necessary to assure that the equipment conforms to the requirements specified herein. No separate payment will be made for testing.

b. CABLE TESTS: The Contractor shall test all loop wire and detector lead-in cable.

1). Loop Wire and Detector Lead-In Tests: Before sealing the loop slots, the loop shall be tested with a megger in the presence of the Engineer and shall not have less than 100 megohms leakage to ground. A continuity test shall also be performed and the loop shall have a resistance of approximately six (6) ohms. If these tests are positive, the loop slot shall be sealed. All recordings shall be given to the Engineer.

The same tests shall be repeated after the slots have been sealed. If these tests are negative, the loop shall be replaced at the Contractor's expense.

After sealing the loop slots, the loop lead-in shall be connected to the controller cabinet

terminal strip and tested in the presence of the Engineer with a test meter to insure that the combined loop and lead-in inductance is within the range of 60 to 490 microhenries. The loop and lead-in system shall also be tested with a megger and shall not have less than 10 megohms leakage to ground. A continuity test shall also be performed and the loop and lead-in shall have a resistance of approximately six (6) ohms.
If any of the above tests are negative, the loop and lead-in shall be replaced at the Contractor's expense. All recordings shall be given to the Engineer.

c. OPERATIONAL TESTS: The Contractor shall conduct approved tests on all installed equipment. These tests shall be performed by the Contractor in the presence of the Engineer. As a minimum, the tests shall include equipment checkout tests for each system component, including provisions for testing all internal and external system interfaces. Equipment checkout shall include the successful exercising of all diagnostic routines provided by the manufacturer. These tests shall demonstrate that the equipment installed at each location is installed properly and that all functions are in conformance with the Contract Documents.
Detailed test plans, prepared by the Contractor, must be approved by the Engineer before the tests begin. The City review period will not exceed thirty calendar days from receipt of the test procedures. The Engineer shall be advised a minimum of thirty calendar days before the start of tests. The Contractor shall make arrangements for the witnessing of tests as requested by the Engineer. Full documentation of test results including problems experienced shall be submitted to the Engineer. Any equipment failing the tests shall be replaced or repaired, and retested at the Contractor's expense.
Operational tests shall include, at a minimum, intersection operational tests.

1). Intersection Operational Tests: Intersection operational tests shall be conducted and successfully completed for each project intersection. They shall demonstrate that all the field equipment installed at each location is installed properly and that all functions are in conformance with the Contract Documents. The intersection operational test shall be a non-central controlled functional test of the local controller, including the time-base coordination function, emergency vehicle preemption function, and the full operation of the intersection.
The controller, detectors (including local and system detectors), cabinet accessories, intersection wiring, emergency vehicle preemption equipment, and traffic signal indications installed under this contract shall be completed and in-place. The controller should have Contractor-installed timing identical to the existing timing at the intersection, and the detector amplifiers shall be adjusted by the Contractor. The Contractor shall test loop and microwave detectors by comparing the detector's counts with visual counts over a 15-minute period for every detector. The two shall agree within five percent of the visual count. If detector sensitivity settings are adjusted in order to meet this test, the new settings shall be recorded on the wiring diagram in the cabinet.

C736.10 L.E.D. TRAFFIC SIGNALS

(a.) Optical Unit: The optical unit shall be a 12in LED (light emitting diode). The Physical, Mechanical, Optical and Light Output, Electrical, Environmental, Production Testing, Documentation and Warranty Requirements are described in this section.

1. General The LED traffic signal module unit shall be designed for installation into specified traffic signal housing and shall not require special tools for installation. The 12in LED traffic signal modules shall fit into specified traffic signal housings without modifications to the housing.

Installation of an LED signal module shall be weather tight, fit securely in the housing; and shall connect directly to electrical wiring.

If proper orientation of the LED unit is required for optimum performance, prominent and permanent directional markings(s), that is an "UP arrow", for correct indexing and orientation shall exist on the unit.

The manufacturer's name, serial number, manufactured date and other necessary identification shall be permanently marked on the backside of the LED traffic signal module. A label shall be placed on the unit certifying compliance to ITE standards.

2. Physical and Mechanical Requirements

The LED traffic signal shall be a single, self-contained device, not requiring on-site assembly for installation into traffic signal housing.

The unit shall be serviceable and repairable without the use of special tools. The LED module shall be constructed to allow the replacement of the outer lens and/or the light engine when needed. The external lens shall be smooth on the outside to prevent excessive dirt/dust buildup.

The assembly and manufacturing process for the LED signal assembly shall be designed to assure all internal LED and electronic components are adequately supported to withstand mechanical shock and vibration from high winds and other sources

Each LED traffic signal module shall comprise a UV stabilized polymeric outer shell, multiple LED light source, and a regulated power supply. LED are to be mounted on a polycarbonate positioning plate or conformally coated PC board. The external lens shall offer sun phantom protection to reduce driver glare or hot spot in sunlight

3. Optical and Light Output Requirements

The LEDs shall be manufactured using AlInGaP (Aluminum-Indium-Gallium-Phosphorous) technology or other LEDs with lower susceptibility to temperature degradation than AlGaAs (Aluminum-Gallium-Arsenic). AlGaAs LEDs will not be allowed.

The number of each color and type of the LED signal module shall be specified in the plans. The modules shall be suitable for span wire and mast arm mounted signals.

The red and green modules shall be similar in appearance and visibility to an incandescent lamp. The red and green modules shall meet the minimum luminous intensity requirements in the following tables:

Minimum Luminous Intensity for LED Signal Modules

(Based on Kentucky Transportation Cabinet Department of Highways Division of Traffic Specification for LED Traffic Signal Modules for Expanded View)

GRID SPECIFICATION FOR 12IN RED

Shaded area is ITE requirements for light intensity

	27.5	22.5	17.5	12.5	7.5	2.5	-2.5	-7.5	-12.5	-17.5	-22.5	-27.5
22.5U												
17.5U					3	10	10	3				
12.5U					14	20	20	14				
7.5U					20	54	54	20				
2.5U					58	220	220	58				
2.5D			77	141	251	339	339	251	141	77		
7.5D	16	38	89	145	202	226	226	202	145	89	38	16
12.5D	16	22	34	44	48	50	50	48	44	34	22	16
17.5D	16	20	22	22	22	22	22	22	22	22	20	16
22.5D			7			10	10			7		
27.5D												

GRID SPECIFICATION FOR 12IN GREEN

Shaded area is ITE requirements for light intensity

	27.5	22.5	17.5	12.5	7.5	2.5	-2.5	-7.5	-12.5	-17.5	-22.5	-27.5
22.5U												
17.5U					7	20	20	7				
12.5U					27	41	41	27				
7.5U					41	108	108	41				
2.5U					115	441	441	115				
2.5D			154	283	501	678	678	501	283	154		
7.5D	32	77	178	291	404	452	452	404	291	178	77	77
12.5D	32	44	69	89	97	101	101	97	89	69	44	44
17.5D	32	41	44	44	44	44	44	44	44	44	41	41
22.5D			14			20	20			14		
27.5D												

The red and green modules are required to meet luminous values that are 115 percent greater than the required minimum values in the specification at time of production. The yellow modules shall meet Caltrans specifications for light intensity, and all other applicable ITE specifications. The LED arrow module shall have a full, filled profile, without the individual LED's being visible. The arrows shall meet all applicable ITE specifications, and Caltrans specifications on light intensity. Independent laboratory reports shall be supplied to verify modules meet the above requirements.

The red and green LED modules shall include a built-in "shut-off" feature, once the module's light intensity falls below ITE minimum requirements. Upon detection of this the circuit will disable any current generating circuitry within 100msec., to allow detection of this failure by conflict monitor and load switch. Also, any power supply failure will give an open circuit.

ARROW INDICATIONS (in candelas/m^2)

	Red	Yellow	Green
Arrow Indication	5,500	11,000	11,000

LEDs for arrow indications shall be spread evenly across the illuminated portion of arrow area. Arrow LED modules shall be tested in conformance with California Test 3001.

Measured chromaticity coordinates of LED signal modules shall conform to the chromaticity requirements of the following table, for a minimum period of 60 months, over an operating temperature range of -40□C to +74□ Each LED traffic signal lamp unit shall meet the minimum requirements for light output for the entire range from 80 to 135 volts.

Chromaticity Standards

Red	Y: not greater than 0.308, or less than 0.998x
Yellow	Y: not less than 0.411, nor less than 0.995-x, nor less than 0.452
Green	Y: not less than 0.506 – 0.519x, nor less than 0.150 + 1.068x, nor more than 0.730-x

LED signal modules tested or submitted for testing shall be representative of typical production units. Optical testing shall be performed with LED signal modules mounted in standard traffic signal section without visors or hood attached to the signal sections.

Photometric, luminous intensity and color measurements for yellow LED signal modules shall be taken immediately after the modules are energized. The ambient temperature for these measurements shall be 25□C. Test results for this testing shall record the current, voltage, total harmonic distortion (THD) and power factor (PF) associated with each measurement.

4. Electrical

All wiring and terminal blocks shall meet the requirements of Section 13.02 of the VTCSH standard.

Each unit shall incorporate a regulated power supply engineered to electrically protect the LEDs and maintain a safe and reliable operation. The power supply shall provide capacitor filtered DC regulated current to the LEDs per the LED manufacturer specification. Design of the power supply shall be such that the failure of an individual component or any combination of components cannot cause the signal to be illuminated after AC power is removed. The power supply must be current regulated.

The LED traffic signal module shall operate on a 60 Hz AC line voltage ranging from 80 volts RMS to 135 volts RMS with less than 10% light intensity variation. Nominal rated voltage for all measurements shall be 120 3 volts rms. The circuitry shall prevent flickering over this voltage range. The current draw shall be sufficient to ensure compatibility and proper triggering and operation of load current switches and conflict monitors in signal controller units the procuring traffic authority customer has in use.

The LED traffic signal module shall be operationally compatible with TS1, TS2 and 2070 controllers, conflict monitors with plus features, and malfunction management units currently used by the City of New Orleans and any other Louisiana government entities. In case of conflicts between specifications, the latest City of New Orleans specification will control.

The individual LED light sources shall be wired so that a catastrophic failure of one LED light source will result in the loss of only that one LED light source in the LED signal module. A circuitry that will shutdown the LED module and power supply when 85% ITE light intensity specifications are not satisfied shall be provided. The signal module on-board circuitry shall include voltage surge protection to withstand high-repetition noise transients and low-repetition high-energy transients as stated in Section 2.1.6, NEMA Standard TS-2, 1992.

Any deviation to product design after testing and approval from the City shall consist of a new model and must be resubmitted for acceptance. Random testing of average production modules will be held to ensure compliance with specification.

Two capped, color-coded, 36 in long 600 V, 20 AWG minimum, jacketed wires, conforming to the National Electrical Code, rated for service at +105°C, are to be provided for electrical connection.

LEDs shall be arranged in no less than 5 equally loaded circuits.

The LED signal shall operate with a minimum 0.90 power factor or greater at 25°C and at the nominal operating voltage.

Total harmonic distortion (current and voltage) induced into an AC power line by signal modules shall not excess 20 percent.

LED signal modules and associated on-board circuitry shall conform to the requirements in Federal Communications Commission (FCC) Title 47, Subpart B, Section15 regulations concerning the emission of electronic noise.

5. Environmental Requirements

The LED signal module shall be rated for use in the ambient operating temperature range of -40°C to + 74°C.

The LED signal module shall be protected against dust and moisture intrusion per the requirements of NEMA Standard 250-1991, for Type 4 enclosures to protect all internal LED, electronic, and electrical components. Evidence of internal moisture after testing shall be cause for rejection.

6. Production Testing Requirements

Each new LED signal modules shall be energized for a minimum of 24 hours, at 100 percent on-time duty cycle, in an ambient temperature of 60°C (+140°F) in order to cause any electronic infant mortality to occur, and to ensure electronic component reliability prior to shipment.

After burn-in, LED signal modules shall be tested for rated initial luminous intensity in conformance with the provisions in "Optical and Light Output Requirements." Before measurement, LED signal modules shall be energized at rated voltage, with 200 percent on-time duty cycle, for a time period of 30 minutes. Test results for this testing shall record the current, voltage, total harmonic distortion (THC) and power factor (PF) associated with each measurement.

7. Documentation Requirements

Each LED traffic signal module shall be provided with the following documentation:

a. Complete and accurate installation wiring guide

b. Contact name, address, and telephone number for the representative, manufacturer, or distributor for warranty repair.

c. If requested by the purchaser, the bidders shall supply schematics for all electronics

A copy of a test report certified by an independent laboratory that the LED traffic signal module model submitted meets ITE Standards for light distribution; chromaticity and power (consumption, power factor and harmonic distortion) must be submitted. The tables in Section 3 of this specification replace the values in Table 1 of Section 4.1.1 of the ITE VTCSH. In addition, the independent lab report shall specify the drive current being supplied to individual LEDs within the unit. Designs that require LEDs to be operated at currents greater than the LED manufacturer's recommended drive current will not be allowed.

One schematic diagram shall be provided for each LED module, along with any necessary installation instructions.

For each unit submitted, the manufacturer name, brand and model number fore LEDs used shall be provided, along with the LED manufacturer's recommended drive current and degradation curves.

8. Warranty

LED signal module shall be warranted against any failure due to workmanship, material defects or intensity within the first 60 months of field operation. The LED module shall meet or exceed minimum luminous intensity values during the first 60 months of field operation.

A written warranty to provide the replacement or repair of LED signal modules that exhibit luminous intensity of less than the minimum values specified in Table 1 of ITE specification VTCSH-Part-2 July 1998, within the first 60 months from the date of delivery shall be provided. Replacement LED signal modules shall be provided within 5 days after receipt of failed LED signal modules at no cost to the City, except the cost of shipping the failed modules.

C736.11 MEASUREMENT AND PAYMENT

Payment for the items of work under this section will be paid for at the contract price under:

Item No.	Pay Item	Pay Unit
S-21 through S-35	Traffic Signalization Items	See Bid Form

STATE PROEJCT NO. 742-36-0110
SPECIFICATIONS FOR INSTALLATION OR REPLACEMENT
WATER MAINS UP TO 12" IN DIAMETER

SECTION C741 — INSTALLATION OR REPLACEMENT WATER MAINS UP TO 12" IN DIAMETER (REVISED)

Water mains shall conform to all of the requirements of the General Specifications and Standard Plans of the Sewerage & Water Board (S&WB) of New Orleans (the latest revision), except as noted.

C741.01 GENERAL:

(a.) The Contractor shall furnish all labor, supervision, materials and equipment required for the replacement of existing water mains with new mains, including house connections, valves, manholes, hydrants, and making necessary offsets, as required. The contractor shall have an individual with a Water Distribution Class IV certification, obtained through the Louisiana Department of Health and Hospitals, on site at all times during the installation of all water related work.

(b.) All workmanship and materials shall conform with section F of the General Specifications of the S&WB, S&WB Standard Drawings and Dwg. No. 7260-SWD except as noted herein.

(c.) The Contractor shall notify the Chief of Engineering of the Sewerage and Water Board in writing a minimum of three working days and not more than ten working days in advance of starting the job.

(d.) All tie-ins to the existing water mains shall be made by the Contractor. The S&WB Forces shall assist in closing valves and witnessing the tests and chlorination of the mains. Contractors shall not operate S&WB valves. Prior to making tie-ins, the Contractor shall notify residents 24 hours in advance of interruption of service.

(e.) The existing utilities shown are approximate. The Contractor shall verify the location of utilities in the field and shall protect them from damage.

(f.) Water and sewer services which are damaged by the Contractor shall be repaired by the S&WB at the Contractor's expense. The Contractor will be furnished a list of the locations of water and sewer house connections. This listing is from S&WB records and the listed locations could vary from the actual locations. It is the Contractor's responsibility to verify the location of these services and to protect them from damage. Furnishing this information should not be construed as a waiver of the Contractor's liability, but rather an attempt on the part of the Board to minimize the Contractor's hazards.

C741.02 MATERIALS AND METHODS:

(a.) All water mains, unless otherwise noted, shall be Class 150 Polyvinyl Chloride (PVC) pipe manufactured in accordance with AWWA C900, latest edition, and shall be U.L. listed. Pipe shall be furnished in standard lengths (min. 16 feet) with integral cast bells or couplings using elastomeric gaskets conforming with the C900 specification. Fittings shall be of ductile iron conforming to ANSI A 21.10 with rubber gasketed joints conforming to A 21.11. Where fittings and valves with mechanical joints are used the bolts and nuts shall be stainless steel.

(b.) No direct tapping of the new pipe will be permitted for making house service connections. Service saddles suitable to use with PVC pipe shall be used; i.e., Clow No. 3407 (all bronze) or JCM 407 Series (stainless steel) with 2 bolts, or J. Jones J-966 (all bronze). The Contractor shall use only shell type hole cutter that will retain the coupon or chips and is designed to accommodate walls equal to pressure class 200.

(c.) The installation of the PVC pipe shall conform with the manufacturer's recommendations and the applicable requirements of Section F of the S&WB General Specifications. The trench bottom shall be relatively smooth and free from roots, rocks, etc. The pipe shall be laid on a smooth bed of pumped sand six inches in depth for the full width of the trench and extending to the top of the pipe. The sand should be placed and consolidated under the pipe haunches to provide adequate side support to the pipe while avoiding displacement and misalignment. The remainder of the trench should be filled with pumped sand well compacted to the grade as required by subsection 741.02(j).

(d.) At points of tie-ins, offsets and other locations where the use of other types of pipe materials are justified, the Contractor shall furnish AWWA C150, Special Thickness Class 52 ductile iron pipe with rubber gasket joints, (as recommended by the pipe manufacturer). All pipe used in fittings shall be ductile iron pipe. All ductile iron pipe shall have cement mortar lining and shall be wrapped with 8 mils polyethylene wrap in accordance with AWWA C105. This tubular wrap shall cover all ductile iron pipe and fittings, including joints, and shall be overlapped a minimum of six inches between sections and sealed with black polyethylene tape.

(e.) Offsets in water mains shall be made by the Contractor with ductile iron fittings or ductile offset fittings. All ductile iron fittings shall be mechanical-joint with retainer glands. All ductile iron pipe and fittings shall be wrapped with 8 mils polyethylene wrap conforming with AWWA C105. Where offsets are made over a utility, there shall not be less than 2.5 feet of cover over the offset piping unless authorized by the S&WB. Before the backfilling of trench, the offsets shall be subjected to an in service visual inspection in the presence of the S&WB.

Water line offsets in the new main that are indicated on the drawings or are required to avoid conflicting utilities that are indicated on the drawings are considered main line fittings and payment is included in the price of the new water main.

Water line offsets that are required in existing water mains or that are required in the new main to avoid conflicts not indicated on the drawings are to be paid at the bid price for water line offsets.

(f.) All fittings, bends, tees, offsets, etc., must have restrained joints in accordance with and for the length recommended by the manufacturer.

(g.) Valves and hydrants shall be procured by the Contractor.

(h.) Valves 4 in. to 12 in. installed in the public right of way shall be S&WB R.D. Wood Gate valves as shown in S&WB Dwg. 11897-W-62. Valves 16 in. and larger shall be American R/D gate valves. Valves shall have raised pattern letters "SEWERAGE AND WATER BOARD" on the body of the valve. Valves must turn clockwise to open. For details of valve box manholes, castings, etc., see S&WB Drawing 6179-F-2. Existing valves that are replaced or no longer needed shall be removed and delivered to S&WB Central Yard, 2900 Peoples Avenue.

(i.) Hydrants shall be in 5 in. Breakaway Fire Hydrant Bronze Trim, as detailed in S&WB Dwg. No. 11825-W-62 or 5.5½ in. American-Darling Co.'s B-62-B. For details of setting hydrants, see latest S&WB Dwg. No. 6179-F-2. Hydrants shall have lugs and other requirements conforming with the General Specifications. Hydrant leads shall be solid wall PVC pipe Class 150 (AWWA C900). All hydrant lead joints shall be restrained. Hydrants shall be installed with wood blocking and be spaced not more than 350 ft. apart, 6 ft. off the projected property line or corner lots, and within 5 ft. of the center of lot for interior lots.

Existing hydrants that are removed shall be delivered to the S&WB Central Yard, 2900 Peoples Avenue.

(j.) Backfill material shall be pumped sand and shall be placed at or near optimum moisture content and compacted according to one of the following procedures:

1. Backfill material shall be placed in layers not to exceed 12 inches. Each layer shall be compacted to a minimum of 95% of maximum density using approved mechanical compaction equipment, or:

2. Backfill material may be placed in layers not exceeding 3 feet by thoroughly flooding to compact each layer to a minimum of 95 percent maximum density prior to placing a subsequent layer. During placement, backfill materials shall be thoroughly saturated with water and satisfactory drainage of materials shall be provided.

The above backfill material and compaction procedures shall be applied also for any service connections, offsets, etc.

C741.03 SERVICE CONNECTIONS:

All existing lead water house service connections shall be replaced with new

polyethylene pipe and fittings from the new or existing main (if not being replaced) to the meter (see S&WB Dwg. No. 7134-W).

Existing services that are not being replaced (i.e., services that are not lead and that are in good condition) shall be tied into new mains using a service saddle and corporation cock. The new tap and cock shall be the same size as the existing connection, unless otherwise noted. Existing services that require lengthening shall be replaced. There shall be no splicing allowed of new or existing water house service connections.

C741.04 INSPECTION:

Preliminary acceptance of the water system is contingent upon the system passing inspection. Final acceptance of the water system is contingent upon one-year maintenance period following satisfactory testing of the system.

The Contractor shall make a hydrostatic test of the main when the entire main has been laid, and all apparent defects in the main, coating, joints, etc., have been repaired as described in Paragraph F-15 of the General Specifications. Testing of only a portion of the main will be done only with the approval of the S&WB. The Contractor shall provide all the equipment and all the labor required for filling and emptying the main, measuring the pressure and leakage. The Contractor shall apply for a construction meter at the Board's House Connection Department to be installed by the Board on a hydrant, and he shall pay the required deposit; the Board will furnish the water free.

All valves in the system shall be wide open so that pressure will come on the flanges and the test plugs which close the ends of the main and its branches, and not on the valve discs.

The main shall be filled from the nearest hydrant to the flange outlet in the test plug (see latest S&WB Drawing 7004-W). The Contractor shall provide the necessary hook up piping. When the main is completely filled with water to the satisfaction of the Engineer, the Contractor shall close the air cocks. He shall apply a hydrostatic pressure of 100 psi on the water main system and shall maintain this pressure for a period of (2) two hours with no discernible pressure loss.

If greater leakage than said quantity develops, the Contractor shall locate the leaks and repair them, working only from outside the main and using only such methods as approved in advance by the Board's Engineer.

It is the intent of these specifications and of the contract based thereon, that all pipe joints be water tight under all service conditions even though the total leakage of any test is within permissible limits as stated herein. Any and all leaks from improperly laid or defective joints which are discovered during the leakage test or tests, or at any time prior to the elapse of one year following the final acceptance by the S&WB of the entire work, will be repaired by and at the expense of the Contractor.

All concrete reaction blocking and anchorages shall be installed before any test section is initially filled with water.

All pipe to be tested should be filled with water a minimum of twenty-four hours prior to testing in order to minimize absorption of water by the inner surface.

Test plugs shall be furnished and installed by the Contractor for testing purpose in accordance with latest S&WB Dwg. No. 7004-W. The test plugs are to be caps or plugs as required and shall be secured to the pipe ends. The test plugs become the Contractor's property after their use.

C741.05 CHLORINATION:

(a.) Chlorination of water mains shall be performed by the S&WB in accordance with Paragraph F-16 of the General Specification after the Hydrostatic test has been successfully completed. Prior to chlorination, the Contractor shall provide and install the materials required by latest S&WB Dwg. 7004-W and flush the mains with maximum flow through a 2" or 4"hose as required. The contractor will be responsible for the cleanliness of the main at all times until completion of the work and final acceptance of the Contract. During construction, the Contractor shall keep the main free from dirt, trench water, debris, rodents, etc. At the end of each day's work or stoppage of work the Contractor must provide an approved temporary water tight wing nut test plug (Model A-902 Climax or equal) at each open end. When the work is resumed, the trench must be free of water and dirt before the plug is removed.

(b.) The Contractor shall notify the S&WB one week in advance of the desired chlorination date. The Board Forces will require approximately four working days, weather permitting, to conduct tests and give approval and acceptance of the system. A single disinfection will provide satisfactory results if the pipe is kept clean and properly flushed prior to chlorination. If the initial disinfection does not produce satisfactory samples the process shall be repeated and the Contractor shall be assessed as indicated below.

(c.) The Board will perform the normal chlorination of the mains at no charge to the Contractor provided the system is in good, clean condition. If, during the chlorination, it is observed that Contractor has not taken proper precautionary measures to prevent contamination, the Board will cease operation until the system is flushed and made clean by the Contractor. The Contractor will be assessed the total cost to the Board for each revisit required to obtain satisfactory results.

C741.06 AS-BUILT DRAWINGS:

Prior to final inspection and testing of the system, the Contractor shall submit to the Board "as-built" drawings, showing any change in line or grade from the original drawings and location of house service connections as per S&WB requirements.

C741.07 PAYMENT:

Payment for the accepted quantities will be made at the contract unit price.

(a.) Payment for the relocation, replacement and installation of water lines shall be made at the contract unit price per Linear foot, including main line fittings and tie-ins, excavation, removal of existing pipe (if any), pumping as necessary, bedding, complete shoring, backfilling and tie-ins. There shall be no direct payment for plugging and abandoning existing mains, or for sand filling existing manholes.

(b.) Water house connection adjustment/replacement shall be made at the contract unit price per each, including excavation, backfilling, service saddles and removal of existing pipe (if any). There shall be no direct payment for tie-ins to existing mains. Existing 5/8" and 3/4" water house connections to be replaced shall be replaced with 1" water house connections with reducers.

(c.) Water line offset, fire hydrant, valve and other items shall be made at the contract unit price per each, including excavation and backfilling. There shall be no direct payment for salvaging existing valves and hydrants.

"New Fire Hydrant" shall include blockings, lugs, tees and leads.

"Adjust Complete Water Meter Box to Grade" shall include cleaning mud and debris inside the box.

"Replace Broken Water Meter Box" shall include any adjustment to grade, cleaning and aligning. Any new box required shall be paid at the unit price bid for this item.

The price bid for "Water Line Offset" shall be for offsets consisting of four (4) bends. Water line offsets consisting of two (2) bends will be paid for at one-half (1/2) the unit price bid. Offsets are paid when the existing waterline is offset. There is no direct pay for offsets on the new waterline.

Payment will be made under:

ITEM NO.	PAY ITEM	PAY UNIT
C741(51)(B)	6" New Water Main with Main Line Fittings	Linear Foot
C741(51)(C)	8" New Water Main with Main Line Fittings	Linear Foot
C741(51)(E)	12" New Water Main with Main Line Fittings	Linear Foot
C741(52)(B)	New 6" Valve	Each
C741(52)(C)	New 8" Valve	Each
C741(52)(E)	New 12" Valve	Each
C741(53)	Tapping Sleeve & Valve Assembly To New Main (Size)	Each

C741(54)	New Fire Hydrant	Each
C741(55)(A)	Replace 3/4" Water House Connection (from Main to Meter)	Each
C741(55)(B)	Replace 1" Water House Connection (from Main to Meter)	Each
C741(56)	Relocation of Fire Hydrant (In Existing Main)	Each
C741(59)	Adjust Water House Connection ¾" & 1"	Each
C741(70)	Additional Ductile Iron Fittings	Ton
C741(71)(B-01)	6" Water Line Offset up to 24"	Each
C741(71)(C-01)	8" Water Line Offset up to 24"	Each
C741(71)(E-01)	12" Water Line Offset up to 24"	Each
C741(72)(B-02)	6" Water Line Offset over 24"	Each
C741(72)(C-02)	8" Water Line Offset over 24"	Each
C741(72)(E-02)	12" Water Line Offset over 24"	Each
C741(73)	Adjust Water Valve Box	Each
C741(74)	New Water Valve Manhole	Each
C741(75)	Remove Mud and Debris from Inside of Water Meter Box	Each
C741(76)	Adjust Complete Water Meter Box to Grade	Each
C741(77)	Replace Broken Water Meter Box (Size)	Each

STATE PROEJCT NO. 742-36-0110
SPECIFICATIONS FOR INSTALLATION, REPLACEMENT, AND RESTORATION OF SEWER SYSTEMS

SECTION C742 – INSTALLATION, REPLACEMENT, AND RESTORATION OF SEWER SYSTEMS (REVISED)

Section C742 of the General Specifications shall be amended as follows:

Section C742- SEWER LINES (Revised)

C742.01 **SEWERAGE CONSTRUCTION.** The work shall be in accordance with the Sewerage and Water Board Specifications and Standard Plans except as noted herein.

C742.02 GENERAL.

(a.) The Contractor shall furnish all labor, materials, equipment and supervision required; including having an individual with a Wastewater Collection Class IV certification, obtained through the Louisiana Department of Health and Hospitals, on site at all times during the installation of all sewer related work:

* Restoration of existing sewer mains by point repair.
* Replacement of existing sewer mains between manholes including tie-in into existing system.
* Relocation of existing sewer mains because of conflicts.
* Installation of new sewer mains, sewer house connections and manholes.
* Replacement of damaged sewer house connections and manholes.
* Installation/rehabilitation of manholes and cleaning of new, replaced or restored mains and manholes.

All work to be done on Sewerage Systems will be as shown on the plans and as directed by the Director. All workmanship, materials and tests shall conform with Section D of the General Specifications of the Sewerage and Water Board, S&WB Standard Drawings, and Sewerage and Water Board Standard Drawing No. 7260-SWD, except as noted hereinafter. The Contractor shall notify the Chief of Engineering of the Sewerage and Water Board in writing not less than three or more than ten working days in advance of starting the job, in order to allow for scheduling the inspection of the work. Failure to do so prior to starting work will result in the Contractor being required to expose the bedding on all pipe previously installed without Sewerage and Water Board inspection.

(b.) All workmanship and materials required to perform this work, shall conform to the current General Specifications of the Sewerage and Water Board and the Department of Public Works except as noted hereinafter.

(c.) The Contractor performing work covered in this section shall be required to coordinate his operations with the Sewerage and Water Board and other utilities prior to making any excavation. The Contractor shall exercise caution in making excavations to avoid damage to these services and other utilities.

(d.) The Contractor will be furnished with a list of the locations of water and sewer house connections from the Sewerage and Water Board. It will be the Contractor's responsibility to verify the location of these so as to avoid damage. Furnishing this information should not be construed as a waiver of the Contractor's liability, but rather an attempt on the part of the Board to minimize the Contractor's hazard. The existing house connections submitted in the lists are from S&WB records and could vary from the actual location. Any damage to the existing water, sewer and drain connections resulting from negligence will be repaired by the S&WB at the expense of the Contractor. The Contractor is also responsible for damage to other utilities and the property of others.

(e.) Existing sewer house connections shall be tied into the new mains and replaced with new connections where required.

C742.03 INSTALLATION AND REHABILITATION OF SEWER MAINS.

(a.) GENERAL:

Work under this section shall consist of furnishing all labor and materials for the replacement, relocation and/or installation of sewer mains, installing new or replacing house connections, point repairs and performing all operations required for improving the sewer system. The Contractor shall provide the necessary dewatering and bypassing required during execution of this work at no direct pay.

(b.) MATERIALS AND METHODS:

Pipe material for sewer mains shall be solid wall polyvinyl chloride (PVC) pipe. The solid wall PVC pipe 6" through 15"shall be manufactured in accordance with ASTM D-3034 specifications for a special gravity sewer pipe dimensions ratio (SDR) of 26. The fittings (tees, wyes, etc.) and bell stock for solid wall PVC pipe shall have a thickness not less than that of the SDR-35 solid wall PVC pipe of the same inside diameter. PVC Sewer Mains sizes 18" through 27" shall be solid wall, PVC pipe conforming to ASTM F-679, Class T-1. PVC pipe shall be type PSM Vinyl Chloride (PVC) standard lengths with integral cast bells and elastomeric gaskets as recommended by the manufacturer and ASTM D-3212. The Sewerage & Water Board reserves the right to approve the type of material.

The maximum allowed deflection for installed PVC sewer pipe is 7.5% reduction in its actual vertical inside diameter not the minimum allowed by the

ASTM Specification. Pipe exceeding this allowed deflection at any time prior to acceptance, shall be removed and replaced with new pipe and reinstalled as per the above specifications at the contractor's expense. The S&WB reserves the right to mandrel any and/or all of the PVC pipe installed. The contractor will install the pull lines and pass the mandrel through the mains selected by the S&WB. The S&WB will provide the mandrel for all tests. The mandreling tests will occur after compacted backfill of the trenches. The Contractor shall bear the cost of mandreling retesting if required and will be assessed $100.00 for each occurrence in each section between manholes. In addition, cleaning and TV/video of the new PVC sewer lines (either in service or not) will occur during final inspection after all paving is completed to verify the absence of construction debris. The Contractor shall bear all costs of cleaning and TV/video test or retesting. It is required that a S&WB representative and the Contractor witness the actual mandreling test(s) and witness the real-time cleaning and TV/video test(s). The S&WB does not desire a copy of the videotape. (No Direct Payment)

Bedding and foundation for mains shall conform with latest S&WB Drawing No. 4697-E5A except as noted below. Backfill and drainage fabric for mains shall be as noted below. Standard sheeting and bracing shall comply with latest DWG. 4697-E5A and with the S&WB General Specifications. The same type and size pipe material must be installed between manholes.

Installation of the solid wall PVC pipe shall conform with Section D of the Sewerage and Water Board General Specifications, "The Construction of Sewer" and the Plastic Pipe Association Specification UNI-B 78, "Recommended Practice for the Installation of Polyvinyl Chloride (PVC) Sewer Pipe." The trench bottom shall be relatively smooth and free from rocks, roots, etc. After the sheeting and/or foundation lumber is placed, the pipe shall be laid on a smooth bed of approved bedding material mentioned below, compacted to a density of not less than 95% relative density, six inches deep for the full width of the trench.

The bedding material shall be extended to six inches above the top of the pipe, well compacted (hand or mechanical) in six inch layers to not less than 95% relative density, as shown on the Standard Plans of the Department of Public Works. The bedding material shall be placed and consolidated under the pipe haunches to provide maximum side support to the pipe while avoiding displacement and misalignment of the pipe.

Bedding material shall Class 1A Angular Material (1/4" to 1-1/2") conforming to ASTM D2321, i.e., crushed concrete or crushed stone. The Sewerage and Water Board reserves the right to approve or disapprove the type of bedding material.

Backfill material shall be pumped sand and shall be placed at or near optimum moisture content and compacted according to one of the following procedures:

1. Backfill material shall be placed in layers not to exceed 12 inches. Each layer shall be compacted to a minimum of 95% of maximum density using approved mechanical compaction equipment. Or,

2. Backfill material may be placed in layers not exceeding three (3') feet by thoroughly flooding and compacting each layer to a minimum of 95% maximum density, prior to placing a subsequent layer. During placement, backfill materials shall be thoroughly saturated with water and satisfactory drainage of materials shall be provided.

The above backfill material and the compaction procedures shall be applied also for any service connections, and point repairs.

Drainage fabric shall be installed according to the following specifications and according to the plan details. Drainage fabric shall be nonwoven pervious sheets of plastic yarn, constructed so that yarns will retain their relative position with respect to each other. Edges of fabric shall be finished to prevent the outer yarn from pulling away from the fabric.

The fabric shall be installed as follows:

1. After the trench is excavated, the foundation lumber shall be placed in the bottom of the trench as required. The filter fabric shall be cut to the needed width including allowances for "loose" placement in the trench and a double-top overlap on top of the bedding material after placement. The fabric shall be laid over the foundation lumber in the trench along its alignment with an 18" minimum overlap at the ends of subsequent lengths. Care should be taken to place the fabric tightly against the soil so that no voids occur behind the fabric. Also, wrinkles or folds should be avoided. The sides of the fabric which will be used as a double-top overlap should temporarily be pinned to the sides of the trench.

2. After installing the fabric, an initial 6" layer of bedding material shall be placed and compacted to the proper grade before placing the sewer pipe. The remainder of the bedding material shall then be placed around and above the pipe and compacted. Compaction is required to seat the fabric and bedding material against the trench wall and to reduce settlement.

3. After compaction, the two edges of the filter fabric shall be unfastened and overlapped on top of the bedding material. The backfill material shall then be placed and compacted as required.

Drainage fabric shall conform to section ASTM D1910.

The Contractor shall provide the Engineer with a sample of the fabric to be used on the project along with a copy of the manufacturer's minimum requirement specifications prior to the start of construction.

Drainage fabric shall be installed around the bedding and under the sand backfill according to the Standard plans.

(c.) REPLACEMENT AND RELOCATION OF EXISTING SEWER MAINS, INSTALLATION OF NEW SEWER MAINS BETWEEN MANHOLES:

The contractor shall furnish all materials, equipment and labor to remove the existing deteriorated main, (if any) install mains and fittings (wyes, tees, etc.), including appurtenances such as tie-ins, to existing system, lumber foundation, bedding, backfilling, necessary dewatering and bypassing, during the execution of this work.

Where the sewer main is relocated, the existing abandoned main must be filled and plugged where shown on the plans. The abandoned sewer line shall be filled with sand, by flooding the pipe to avoid caving in of the sewer line.

All workmanship, materials and tests shall conform to Section D of the General Specifications of the S&WB, except as noted otherwise. The Contractor may use more than one crew in performing work in various sections of a system at a given time, provided he has the approval of the Director.

The new sewer mains and house connections shall be installed at the elevations and locations indicated on the plans, unless changed by the Director. The Contractor shall schedule his work so that the sewer mains and house service connections between two manholes are completed before moving to another location (this will minimize the spillage of raw sewage into an open trench). The Contractor shall isolate the block where the work is in progress by plugging the upstream and downstream manholes. Should the sewage build up to within three feet of the upstream manhole, or if directed by the S&WB, the Contractor shall pump the liquid to the downstream manhole through bypass piping. No mains or lines shall be left open overnight; a temporary tie-in shall be made between the end of the new main and the existing, and plugs at manholes shall be removed so as to allow flow to continue until work is resumed.

Where it is necessary to connect the sewers to existing manholes, the existing short bell pieces remaining in the wall of the manhole shall be broken out. A new short bell piece shall be inserted to the full thickness of the walls and permanently grouted in place (see latest S&WB Dwg. 6178-B6). The new short bell

piece shall be a sand impregnated PVC stub, grouted with a type three, high early strength cement, or quick setting EMBECO or similar material.

If a PVC pipe is to be connected to a manhole or other concrete or brick structure, the Contractor shall use a sand impregnated PVC stub, grouted with cement grout as specified above, for the manhole connection.

(d.) POINT REPAIRS OF EXISTING SEWER MAINS:

The Contractor shall make point repairs to the lines at specific locations shown on the drawings and as listed in the proposal.

Point repairs shall be made by either wet or dry type and shall conform to Section XII of NASSCO (National Association of Sewer Service Companies). The Contractor shall make an excavation to expose a basic "ten (10') linear feet" of main, per point repair. Any additional footage of repair beyond the ten foot minimum for each point repair, shall be approved by the Director.

For sewer point repairs, and for all other sewer repairs, the connection of any two dissimilar materials shall be accomplished by the installation of a "no-hub" coupling consisting of a neoprene sleeve and bushing adapter, two stainless steel bands and stainless steel screws. The coupling shall be manufactured in strict accordance with the Cast Iron Soil Pipe Institute Specifications C301, latest revision, as manufactured by Tyler Pipe Company, Mission Clay Products Corps., Fernco, or approved equal.

Bedding, foundation lumber, backfill, drainage fabric around bedding, and standard sheeting and bracing shall be the same as described herein for sewer mains and as shown on latest S&WB Drawing No. 4697-E5A and on the "Typical Section of Sewer Trench" detail on the project drawings. The above requirements for bedding, foundation lumber, backfill, drainage fabric, and sheeting and bracing shall also apply to the existing pipe to be tied onto, for a distance of not less than one (1") foot beyond the end of the existing pipe to insure proper bedding under the new coupling.

The above shall also apply to any sewer repairs done under the description "beyond point repair."

The Contractor is required to have all materials and equipment on hand prior to the start of excavation so that there will be a minimum of inconvenience to the residents. All trenches must be backfilled at the end of the day.

(e.) SEWER HOUSE CONNECTIONS:

New or replacement sewer house connections, where required, shall be six (6") inch pipe extended from the main to the property line or to a point directed by the Director. Bedding and foundations required under sewer mains are not required under six (6") inch sewer house connections, but 6" of compacted pumped sand is required as bedding under 6" sewer house connections. Backfill is required the same as described herein for sewer mains.

The use of saddles to connect the house service to the main will not be permitted; all such connections shall be made using wye or tee fittings except on lined sewer mains.

All existing sewer house connections connected to sewer lines that are being replaced shall be removed and replaced from the new sewer line to property line and tied to the existing service at that point.

The need for replacing existing sewer house connections that are connected to existing sewer lines that are not being replaced shall be as directed by the Sewerage & Water Board after field inspection or as indicated on the Drawings. These services will be removed and replaced from the existing sewer line to property line and tied to the existing service at that point.

The need for replacing existing sewer house connections from the back of curb to the property line (or any point between) shall be determined by the Sewerage & Water Board after field inspection or as indicated on the Drawings and the new pipe will be tied into the existing pipe at that point.

New sewer house connections shall be installed from an existing, new, or "removed and replaced" sewer main to property line at locations where no service presently exists as directed by the Sewerage & Water Board or as indicated on the Drawings.

All pipe and fittings shall be of the same material as the main, unless approved by the S&WB. The connection of any two dissimilar materials shall be accomplished by the installation of a "No-Hub" coupling, consisting of a neoprene sleeve and bushing adaptor and two stainless steel bands with stainless steel screws. The coupling shall be manufactured in strict accordance with Cast Iron Soil Pipe Institute Specifications C-301, latest revision, as manufactured by Tyler Pipe Company, Mission Clay Products Corps., Fernco, or approved equal.

Where existing or proposed subsurface facilities conflict with existing sewer house connections, these same connections shall be adjusted to provide for adequate clearance in accordance with the S&WB Standard Specifications. No siphons will be permitted. Adjustment of sewer house connections shall comply with the above specifications for replacement of sewer house connections.

(f.) SANITARY SEWER MANHOLE.

New sanitary sewer manholes required when installing new sewer mains or relocating existing sewer mains shall be constructed in accordance with the applicable sections of the S&WB General Specifications and latest S&WB Standard Drawings No. 6178-B-6 and No. 6178-B-6A

To abandon existing sewer manholes, the Contractor shall remove the casting and cover, remove the manhole wall three (3) foot depth, plug all pipes, and fill the remainder of the manhole with pumped sand, compacted to 95% maximum density. There will be no direct pay for abandoning sewer manholes. Removed casting and cover shall be returned to S&WB.

(g.) INSPECTION.

At the completion of the point repair or installation of mains between manholes, and prior to final acceptance, the Board may inspect the mains with a remote control television unit. The Contractor shall assist by notifying the residents to refrain from use of these services during the inspection. The Contractor will be required to repair at his expense and in an approved manner, all defects in his workmanship disclosed by these tests and inspections before final acceptance.

C742.04 MEASUREMENT.

Sewer mains will be measured in place and the length determined by measuring from center to center of manholes or other subsurface structures of which they form a part.

Depth of sewer mains for payment purposes shall be determined by measurement from the invert to the top of casting at original existing grades of connecting manholes. Depth of manholes shall be measured from invert to the top of casting.

C742.05 PAYMENT.

(a.) Payment for relocation, replacement and restoration of existing sewer mains or installation of new sewer mains shall be made at the contract unit price per linear foot of the size and depth, which includes excavation, bypass pumping as necessary, complete shoring, foundation lumber, bedding, installation of new main, including fittings, backfill, drainage fabric and tie-ins. If the existing sewer main is to be removed or abandoned in place, the cost shall include removal or abandonment of the existing sewer main, per Item No. C742(51).

(b.) Payment for "install sewer manhole" shall be made at the contract unit price per foot height, including excavation, granular bedding, foundation slab and backfilling. If the existing manhole is to be replaced, the cost shall include removal of the existing sewer manhole, per item C742(55).

(c.) Payment for "replacing manhole, casting and cover" shall be made at the contract unit price per each including removal of the existing sewer manhole casting, installing the new casting at the specified grade and backfilling the excavation with approved backfill material. Adjustment to grade of the manhole casting shall be included in the cost of replacement, per item C742(56).

(d.) Payment for "point repair of existing sewer mains" shall be made at the contract unit price per each of the size and depth specified, including excavation, foundation lumber, bedding, drainage fabric, backfill, complete shoring, removal of existing pipe, pumping as necessary, couplings and tie-ins, per Item No. C742(57). Payment for point repair beyond ten (10') feet shall be made at the contract unit price per the linear foot, including the above work, per Item No. C742(58).

(e.) Payment for "new sewer house connection from main to back of curb" shall be made at the contract unit price per each of the size specified including installation of a wye or tee in the main, PVC pipes, fittings, a cap behind the curb, excavation and backfill, per Item No. C742(59).

(f.) Payment for "replacing existing sewer house connection from existing main to back of curb" shall be made at the contract unit price per each including the installation of PVC pipe, removal of existing pipe, fittings, excavation, backfill and tie-ins from the existing wye or tee to the existing sewer house connection back of curb, per Item No. C742(60).

(g.) Payment for "reconnecting existing sewer house connection to new main up to three feet" shall be made at the contract unit price per each including installation of a new tee or wye into the main, removal and replacement of up to three feet of the existing, excavation and backfill, per Item No. C742(61).

(h.) Payment for "reconnecting existing sewer house connection to new main and extending to back of curb" shall be made at the contract unit price per each including the installation of PVC pipe, fittings, excavation, backfill, tie-in, removal of existing pipe and installation of a new wye or tee in the new main, from the new wye or tee to the existing sewer house connection back of curb, per Item No. C742(62).

(i.) "Replacing existing sewer house connection beyond back of curb." If directed by the Director to replace the sewer house connections in (f) or (h) beyond back of curb, payment for this item shall be made at the contract unit price per

linear foot per any additional footage beyond back of curb, including tie-ins, excavation, backfill and removal of existing pipe, per Item No. C742(63).

(j.) "Adjust Sewer House Connections" includes removing and replacing up to fifteen 15' feet of existing sewer house connection where required to avoid conflict with new water, drain, or other utility line, including tie-ins at both ends, fittings, excavation, installation and backfill, no siphon permitted. Payment for this item shall be made at the contract unit price, per Item No. C742(64).

(k.) Payment for "New sewer house from new main to property line" shall be made at the contract price per each including the installation of PVC pipe, fittings, back fill and connection to existing house connection per Item No. C742(67).

New or replaced sewer house connections shall be installed so as to avoid conflict with new or proposed subsurface facilities. There will be no additional payment under the item "Adjust Sewer House Connection".

Payment for "pipe lining" shall be made at the contract unit price per linear foot of the size and method specified to; (1) clean and inspect the existing pipe to be sure that the liner can be properly installed, (2) install the liner in accordance with special specifications; and (3) clean up and restore any damage caused by the lining process.

(l.) Payment for "cut liner to restore existing service connections" shall be made at the contract unit price per each of the size and the method specified. If the lining method for restoring service connections requires excavation, the price shall include all excavation, backfill and surface restoration.

Payment will be made under:

ITEM NO.	PAY ITEM	PAY UNIT
C742(51)	Install Sewer Mains (Size & Depth)	Linear Foot
C742(55)	Install Sewer manholes	Foot High
C742(56)	Replace Sewer Manhole Casting	Each
C742(57)	Sewer Point Repair up to Ten Feet (Size & Depth)	Each
C742(58)	Beyond Sewer Point Repair (Size & Depth)	Linear Foot
C742(59)	New Sewer House Connections from Main To Back of Curb (Size)	Each
C742(60)	Replace Existing Sewer House Connection From Existing Main to Back of Curb	Each
C742(61)	Re-Connect Existing House Connection To New Main Up to Three Feet	Each
C742(62)	Replace Existing Sewer House Each Connection from New Main to Back of Curb	Each
C742(63)	Replace Existing House Connection Beyond Back of Curb	Linear Foot
C742(64)	Adjust Sewer House Connection	Each
C742(65)	Pipe Lining (Size & Method)	Linear Foot
C742(66)	Cut Liner to Restore Existing Sewer House Connection (Size & Method)	Each
C742(67)	New Sewer House Connection from New Main Property line	Each

SECTION C1000 SPECIAL BID ITEMS

C1000.01 GEOGRID (ITEM S-1):

(a.) Work under this section includes furnishing and placing geogrid reinforcement in the areas shown on the plans prior to placement of base course.

(b.) The geogrid shall be a biaxially oriented polymer grid structure composed of polypropylene or high density polyethylene with apertures designed to interlock with surrounding fill material. The joints at the crossover points of mesh itself, welded or interwoven in such a manner that the elements will not separate under handling and construction activities or under dynamic loads anticipated over the life of the structure. The geogrid shall be resistant to damage during construction, including ultraviolet degradation, and it shall have long-term resistance to chemical and biological degradation caused by the materials being reinforced.

(c.) Detailed Requirements:

Geogrid shall meet the following minimum requirements:

Property	Test Method	Requirements
Aperture Size	I.D. Calipered	1.0 - 2.0 in.
Open Area, min.	COE Method	70%
Flexural Rigidity, min.	ASTM D 1388-64	250,000 mg-cm
Tensile Modulus, min.	GRI GGI-87	14,000 lb/ft
Junction Efficiency, min.	CRI GG2-87	90%

All numerical values represent minimum average roll values required in the designated direction.

(d.) The Contractor shall submit a Certificate of Compliance that the geogrid meets the physical properties outlined above. The Owner reserves the right to randomly sample and test geogrid material.

(e.) The geogrid shall be placed in continuous sheets parallel to the centerline. Adjacent sheets of grid shall be overlapped a minimum of 18 inches. Care shall be taken to ensure that geogrid sections do not separate during construction.

(f.) The grid shall be cut to conform to curved sections so as to maintain parallel placement to centerline. Care shall be taken to ensure that excessive buckling of the grid material does not occur. Excess material quantity, if any, required for making curves shall be at no direct pay.

(g.) Tracked equipment will not be allowed to operate on the grid. Damaged fabric shall either be removed and replaced with new grid or covered with a second layer of grid extending three feet in each direction from the damaged area.

(h.) Each grid roll shall be labeled or tagged to provide product identification sufficient for field inventory and quality control purposes. Rolls shall be stored in a

manner which protects them from the elements. If stored outdoors, they shall be elevated and protected from ultraviolet light.

(i.) Measurement and Payment:

Quantity of Geogrid reinforcement will be paid by the square yard of covered area at the bid price in the proposal. This price includes all labor, equipment, and materials to install the grid in accordance with the plans and specifications.

C1000.02 REMOVE AND REPLACE TREE WITH CREPE MYRTLE (ITEM S-2), TREE TRIMMING AND/OR ROOT PRUNING (ITEM S-3)

(a.) Work under these items consists of all labor, equipment and materials to accomplish the specific item of work. Work under these items shall conform to all the requirements of Section 719 of the Standard Specifications for Roads and Bridges, 2006 edition, except as amended by Section C719 of these specifications.

(b.) Item S-2 and Item S-3 shall be measured and paid for on a per each basis at the bid price in the proposal. This price includes all labor, equipment and material necessary to complete the work in accordance with the plans and specifications.

C1000.03 MANHOLES (S&WB OF NEW ORLEANS)(DWG. D-870)(TYPE NO. 2)(ITEM S-4); MANHOLES (S&WB OF NEW ORLEANS)(DWG. D-870)(TYPE NO. 3)(ITEM S-5); MANHOLES (S&WB OF NEW ORLEANS)(DWG. D-870)(LARGE PIPES)(ITEM S-6); MANHOLES SPECIAL CONFLICT (ITEM S-7); CATCH BASINS (S&WB OF NEW ORLEANS)(DWG. D-873)(STD. NO. 1)(ITEM S-8); CATCH BASINS (S&WB OF NEW ORLEANS)(DWG. D-873-A)(DBL. NO. 1)(ITEM S-9) AND DROP INLETS (S&WB OF NEW ORLEANS)(DWG. D-3264)(ITEM S-10)

(a.) Work under these items consists of all labor, equipment and materials to construct the manhole, catch basin or drop inlet at the location indicated on the Contract Drawings. The manhole, catch basin or drop inlet shall conform to all the requirements of the General Specifications and Standard Plans of the Sewerage and Water Board (S&WB) of New Orleans (the latest revision), except as amended by Section C702 and Section C1001 of the specifications.

(b.) Items S-4 through S-10 shall be measured and paid for on a per each basis at the bid price in the proposal. This price includes all labor, equipment and materials necessary to complete the work in accordance with the plans and specifications.

C1000.04 6" WATER LINE OFFSET (ITEM S-11):

(a.) Water line offsets may be required at locations indicated on the Contract Drawings. The Engineer shall determine, on a case by case basis, if a water line offset will be required. The water line offsets shall conform to all the requirements of the General Specifications and Standard Plans of the Sewerage and Water Board (S&WB) of New Orleans (the latest revision), except as amended by Section C741 of these specifications.

(b.) Measurement and Payment:

Water line offsets shall be measured and paid for on a per each basis at the bid price in the proposal. This price includes all labor, equipment and materials, and excavation to locate the existing water line, to install the water line offset in accordance with the plans and specifications.

C1000.05 12" WATER MAIN (PVC) WITH MAIN LINE FITTINGS (ITEM S-12):

(a.) Work under this item consists of all labor, equipment and materials to furnish and install the 12" PVC water main at the locations indicated on the Contract Drawings. The 12" PVC water main shall conform to all the requirements of the General Specifications and Standard Plans of the Sewerage and Water Board (S&WB) of New Orleans (the latest version), except as amended by Section C741 and Section C1001 of these specifications.

(b.) The 12" PVC water main shall be measured and paid for on a linear foot basis at the bid price in the proposal. This price includes all labor, equipment and materials necessary to furnish and install the 12" PVC water main in accordance with the plans and specifications.

C1000.06 NEW MANHOLE AROUND EXISTING WATER VALVE (ITEM S-13):

(a.) New water valve manholes shall be constructed around existing water valves at locations indicated on the Contract Drawings. Care shall be exercised by the Contractor to maintain and support the existing water valve during construction of new manhole. New water valve manholes shall conform to all the requirements of the General Specifications and Standard Plans of the Sewerage and Water Board (S&WB) of New Orleans (the latest revision), except as amended by Section C741 of these specifications.

(b.) Measurement and Payment:

New manholes around existing water valves shall be measured and paid for on a per each basis at the bid price in the proposal. This price includes all labor, equipment and materials to construct the new manhole in accordance with the plans and specifications.

C1000.07 REPLACE ¾" WATER HOUSE CONNECTION (FROM MAIN TO METER)(ITEMS S-14); REPLACE 1" WATER HOUSE CONNECTION (FROM MAIN TO METER)(S-15):

(a.) Existing water house connections shall be replaced as stipulated in Section C741 of these specifications or as directed by the Engineer. Replacement of water house connections shall conform to all the requirements of the General Specifications and Standard Plans of the Sewerage and Water Board (S&WB) of New Orleans (the latest revision), except as amended by Section C741 and Section C1001 of these specifications.

(b.) Measurement and Payment:

Items S-14 and S-15 are contingency bid items. Replacement of existing water house connections shall be measured and paid for on a per each basis at the bid price in the proposal. This price includes all labor, equipment and materials to install the water house connection in accordance with the plans and specifications.

C1000.08 REPLACE SEWER HOUSE CONNECTIONS TO BACK OF CURB (ITEMS S-16); REPLACE EXISTING SEWER HOUSE CONNECTION BEYOND BACK OF CURB (S-17):

(a.) Existing sewer house connections shall be replaced as stipulated in Section C742 of these specifications or as directed by the Engineer. Replacement of sewer house connections shall conform to all the requirements of the General Specifications and Standard Plans of the Sewerage and Water Board (S&WB) of New Orleans (the latest revision), except as amended by Section C742 and Section C1001 of these specifications.

(b.) Measurement and Payment:

Items S-16 and S-17 are contingency bid items. Replacement of existing sewer house connections shall be measured and paid for on a per each basis at the bid price in the proposal. This price includes all labor, equipment and materials to install the sewer house connection in accordance with the plans and specifications

C1000.09 PROJECT SIGN (ITEM S-18)

(a.) Project Sign: Provide and maintain a professional quality painted sign, measuring eight feet (8') high by eight feet (8') wide on which will be placed the information provided to the Contractor by the Engineer.

(b.) Sign Submittal: Prior to construction, submit three (3) copies of the proposed sign layout to the Engineer for review and subsequent submittal to the appropriate agencies for review and approval. Do not produce project sign until proposed layout has been approved.

(c.) Sign Construction This sign shall have at least one (1) prime coat of paint prior to the application of letters, background and trim. The sign background shall be white. All lettering shall be black and shall be capitalized. Except for the job sign specified above, no Contractor, Sub-contractor, or equipment supplier shall post or display any sign or advertising device on any part of the site, structure, fence or temporary structure. Maintain the sign for the duration of the project.

(1) Sign board: ¾" thick DEPA-EXT A-Face plywood.

(2) Paint: Exterior grade oil base enamel.

(3) Supports: 4x4 treated wood posts with 2x4 treated braces, set firmly in ground. Height of sign top above grade: 11'-0".

(d.) Sign Removal: The project sign shall be removed at the end of the project when directed by the Engineer. Remove and deliver all sign materials to the Owner, at the location specified by the Owner.

(e.) Measurement and Payment.

Project signs shall be measured and paid for on a per each basis at the bid price in the proposal. This price includes all labor, equipment and materials to install the project sign in accordance with the plans and specifications.

C1000.10 EXPLORATORY EXCAVATION (ITEM S-19)

(a.) Work under this item consists of all work required for the Contractor to conduct a field investigation at locations directed by the Engineer, including exploratory excavations in advance of construction to determine the existing location, size and depth of underground utilities, whether or not shown on the Drawings. The work includes contacting the utility and meeting with the utility representatives; assisting utility representatives, if necessary, during their layout of utilities it the field; excavating to expose the utility; backfilling excavated pits and filling with Mississippi River "pumped" sand and compacting as required for other utilities (drain, sewer, water) and installing temporary aggregate surface; and documenting and furnishing the information to the Engineer.

(b.) Measurement and Payment:

Exploratory excavations shall be measured and paid for on a per each basis at the bid price in the proposal. This price includes all labor, equipment and materials to perform the exploratory excavations in accordance with the plans and specifications.

C1000.11 REMOVE AND RELOCATE SCHOOL ZONE SIGN AND BLINKING LIGHT (ITEM S-20):

(a.) Work under this item consists of all labor, equipment and materials required for the Contractor to remove and relocate the school zone sign and blinking light at the location indicated on the Contract Drawings. All work and materials shall conform to all the requirements of Section C736 of the Contract Specifications as well as all other applicable Standards and Codes.

(b.) Measurement and Payment:

Remove and relocate school zone sign and blinking light shall be measured and paid for on a per each basis at the bid price in the proposal. This price includes all labor, equipment and materials to remove and relocate the school zone sign and blinking light in accordance with the plans and specifications.

C1000.12 THREE (3") INCH CONDUIT (ITEM S-21); SIGNAL SUPPORT, DOUBLE MAST ARM (STND.) INCLUDING FOUNDATION (ITEM S-22); SIGNAL SUPPORT, PEDESTAL POLE INCLUDING FOUNDATION (ITEM S-23); SIGNAL HEADS,

VEHICULAR, 12" LENS, 3 SECTION (ITEM S-24); SIGNAL CONTROLLER WITH TYPE B FOUNDATION (ITEM S-25); OPTICAL DETECTORS (ITEM S-26); PHASE SELECTOR (ITEM S-27); OPTICAL DETECTOR CABLE (No. 20/3C) (ITEM S-28); TRAFFIC SIGNAL CABLE (No. 14/7C) (ITEM S-29); TRAFFIC MANHOLES (ITEM S-30); RELOCATE EXISTING SIGNAL PEDESTAL, POLE INCLUDING NEW FOUNDATION, DEMOLITION OF EXISTING FOUNDATION, AND REWIRING (ITEM S-31); RELOCATE EXISTING SIGNAL, DOUBLE MAST ARM, INCLUDING NEW FOUNDATION, DEMOLITION OF EXISTING FOUNDATION, AND REWIRING (ITEM S-32); RELOCATE EXISTING SIGNAL CONTROLLER, INCLUDING NEW FOUNDATION, DEMOLITION OF EXISTING FOUNDATION, AND REWIRING (ITEM S-33); AND, RELOCATE EXISTING SIGNAL SERVICE METER AND POLE, INCLUDING NEW FOUNDATION , DEMOLITION OF EXISTING FOUNDATION AND REWIRING (ITEM S-34):

(a.) Work under these items consists of all labor, equipment and materials to complete the specific item of work. Work under these items shall conform to all the requirements of Section 736 of the Standard Specifications for Roads and Bridges, 2006 Edition, except as amended by Section C736 of these specifications.

(b.) Items S-21 through Item S-34 shall be paid for on a unit basis at the bid price in the proposal. This price includes all labor, equipment and materials necessary to complete the work in accordance with the plans and specifications. Items S-31 to S-34 are contingency bid items.

C1000.13 MAINTAIN TRAFFIC SIGNALS DURING CONSTRUCTION (ITEM S-35):

(a.) Work under this item consists of all labor, equipment and materials to complete the specific item of work. Work under this item shall conform to all the requirements of Section 736 of the Standard Specifications for Roads and Bridges, 2006 Edition, except as amended by Section C736 of these specifications.

(b.) Item S-35 shall be paid for on a lump sum basis at the bid price in the proposal. This price includes all labor, equipment and materials necessary to complete the work in accordance with the plans and specifications.

C1000.14 SAW CUT EXISTING PAVEMENT (FULL DEPTH) INCLUDING CURB (ITEMS S-36); SAW CUT, WHEEL CUT OR SPADE CUT EXISTING ASPHALTIC CONCRETE PAVEMENT (FULL DEPTH)(S-37):

(a.) To ensure against ragged connections between old and new work, saw cutting will be required at roadway, sidewalks, driveways, curbs, and/or at other Construction areas as may be designated by the Engineer. All saw cutting of existing concrete pavement, sidewalk, driveway, and concrete curb and gutter bottom shall be full depth cut. All saw cutting of existing asphalt pavement, sidewalks, driveways and curbs shall be full depth cut. After the edges have been cut, the areas to be removed are to be broken in small pieces with pneumatic chisels or drills and the material removed.

(b.) Measurement and Payment:

No separate measurement shall be made for the saw cutting of existing sidewalks, driveways, footlaps, and curbs. The cost to provide all labor, equipment and materials necessary for the saw cutting of sidewalks, driveways, footlaps and curbs shall be included in the unit price bid per square yard of removal of walks, drives, footlaps and incidental paving.

Saw cutting of existing street pavements shall be measured and paid for per linear foot of saw cut at the bid price in the proposal. This price includes all labor, equipment and materials to perform the saw cutting in accordance with the plans and specifications

C1000.15 STREET NAME SIGNS ON NEW POST OR MAST ARM (ITEM S-38):

(a.) Work under this item includes all labor, equipment and materials necessary to provide and install street name signs on a new post or on a traffic signal mast arm as directed by the Engineer and as detailed on the Contract Drawings. Signs and mounting devices shall be installed in accordance with the General Specifications for Street Paving (latest edition) of the Department of Public Works, City of New Orleans, Louisiana.

(b.) Measurement and Payment:

Street name signs on new post or mast arm shall be measured and paid for on a per each basis at the bid price in the proposal. This price includes all labor, equipment and materials to install the Street Name Signs in accordance with the plans and specifications.

C1000.16 HAND FORMED AND POURED IN PLACE CONCRETE CURB WITHIN THE LIMITS OF TREE DRIP LINE (ITEM S-39):

(a.) Work under this item includes all labor, equipment and materials necessary to hand form and pour in place concrete curb within the limits of a tree drip line, in locations as directed by the Department of Parks and Parkways. All material and work shall conform to all the requirements of Section 707 of the Standard Specifications for Roads and Bridges, 2006 Edition, except as amended by Section C707 of these specifications.

(b.) Measurement and Payment:

Item S-39 is a contingency Bid Item. Hand formed and poured in place concrete curb within the limits of a tree drip line shall be measured and paid for on a linear foot basis at the bid price in the proposal. This price includes all labor, equipment and materials to construct the concrete curb in accordance with the plans and specifications. Root pruning that may be required within the limits of a tree drip line shall be paid for under the Bid item for Tree Trimming and/or Root Pruning.

C1000.17 GRAVEL BED AND FILTER CLOTH OVER TREE ROOTS (ITEM S-40):

(a.) Work under this item includes all labor, equipment and materials to furnish and install the gravel bed and filter cloth over tree roots at locations as directed by the

Owner. Work under this items shall conform to all the requirements of Section 719 of the Standard Specifications for Roads and Bridges, 2006 edition, except as amended by Section C719 of these specifications.

(b.) Item S-40 is a contingency bid item. Gravel bed and filter cloth over tree roots shall be paid for on a square yard basis at the bid price in the proposal. This price includes all labor, equipment and materials necessary to complete the work in accordance with the plans and specifications.

C1000.18 NOT USED

C1000.19 8" PVC DRAIN HOUSE CONNECTION COLLECTOR LINE (ITEM S-41); AND, REPLACE DRAIN HOUSE CONNECTION BEYOND BACK OF CURB (ITEM S-42):

(a.) Existing drain house connections shall be replaced as stipulated in Section C701 as amended by Section C1001 of these specifications or as directed by the Engineer. Existing drain house connections shall be tied into a required collector line, or if adjacent to a catch basin, the drain house connection shall be tied into the back of the catch basin. Replacement of drain house connections shall conform to all the requirements of the General Specifications and Standard Plans of the Sewerage and Water Board (S&WB) of New Orleans (the latest revision), except as amended by Section C701 and Section C1001 of these specifications.

(b.) Measurement and Payment:

Items S-41 and S-42 are contingency items. Furnishing and installing the required 8" PVC Drain House Connection Collector line shall be measured and paid for on a per linear foot basis at the bid price proposal, Item S-41. This price includes all labor, and materials to install the collector line, including removal of existing pipes, fittings and backfill and connection of the collector line into the catch basin and connection of existing drain house connections to the collector line. Furnishing and installing the Drain House Connection Beyond Back of Curb shall be measured and paid for per linear foot of drain house connections at the bid price proposal, Item S-42. This price includes all labor and materials to install the drain house connection beyond back of curb, including the removal of existing pipes, fittings, connections and backfill.

C1000.20 60" RCP DRAIN LINE TIE-IN TO EXISTING CONCRETE BOX CULVERT (ITEMS S-43); AND, 48" RCP DRAIN LINE TIE-IN TO EXISTING CONCRETE BOX CULVERT (ITEM S-44); AND, 36" RCP DRAIN LINE TIE-IN TO EXISTING CONCRETE BOX CULVERT (ITEM S-45):

(a.) Work under these items includes all labor, equipment and materials necessary to install the drain line tie-in to the existing box culvert at the locations indicated on the Contract Drawings.

(b.) Measurement and Payment:

Drain line tie-in to existing concrete box culvert shall be paid for on a per each basis at the bid price in the proposal. This price includes all labor, equipment and materials to

construct the drain line tie-in, including temporary dams, dewatering, bracing, shoring, excavation, cutting into box culvert and installation of tie-in, all in accordance with methods approved by the Louisiana Department of Transportation and Development and the Sewerage and Water Board of New Orleans.

C1000.21 WATER MAIN (8" PVC) WITH MAIN LINE FITTINGS (ITEM S-46):

(a.) Work under this item consists of all labor, equipment and materials to furnish and install the 8" PVC water main at the locations indicated on the Contract Drawings. The 8" PVC water main shall conform to all the requirements of the General Specifications and Standard Plans of the Sewerage and Water Board (S&WB) of New Orleans (the latest version), except as amended by Section C741 and Section C1001 of these specifications.

(b.) The 8" PVC water main shall be measured and paid for on a per linear foot basis at the bid price in the proposal. This price includes all labor, equipment and materials necessary to furnish and install the 8" PVC water main in accordance with the plans and specifications.

C1000.22 ADJUSTING WATER VALVE AND/OR METER BOX (COMPLETE TO GRADE) INCLUDING REMOVAL OF MUD AND DEBRIS INSIDE THE WATER METER OR VALVE BOX (ITEM S-47):

(a.) Work under this item consists of all labor, equipment and materials to accomplish the specific item of work. Work under this item shall conform to all the requirements of the General Specifications and Standard Plans of the Sewerage and Water Board (S&WB) of New Orleans (the latest version), except as amended by Section C741 and Section C1001 of these specifications.

(b.) Item S-47 shall be measured and paid for on a per each basis at the bid price in the proposal. This price includes all labor, equipment and materials necessary to complete the work in accordance with the plans and specifications.

C1000.23 UNTREATED TIMBER FOUNDATION FOR BEDDING MATERIALS (ITEM S-48):

(a.) Work under this item consists of all labor, equipment and materials to furnish and install the untreated timber for bedding materials. The untreated timber shall conform to all the requirements of the General Specifications and Standard Plans of the Sewerage and Water Board (S&WB) of New Orleans (the latest version).

(b.) Item S-48 shall be measured and paid for on a per thousand board feet basis (MFBM) at the bid price in the proposal. This price includes all labor, equipment and materials necessary to complete the work in accordance with the plans and specifications.

C1000.24 BRICK SIDEWALK OR FOOTLAP (ITEM S-49):

(a.) Work under this item consists of all labor, equipment and materials to furnish

and install the brick sidewalk or footlap at the locations indicated on the Contract Drawings. Work under this item shall conform to all the requirements of Section 706 of the Standard Specifications of Roads and Bridges, 2006 Edition, except as amended by Section C706 of these specifications.

(b.) Item S-49 shall be measured and paid for on a per square yard basis at the bid price In the proposal. This price includes all labor, equipment and materials necessary to complete the work in accordance with the plans and specifications.

C1000.25 EXPOSED AGGREGATE SIDEWALK (4" THICK) (ITEM S-50):

(a.) Work under this item consists of all labor, equipment and materials to furnish and install the exposed aggregate sidewalk (4" Thick) at the locations indicated on the Contract Drawings. Work under this item shall conform to all the requirements of Section 706 of the Standard Specifications of Road and Bridges, 2006 Edition, except as amended by Section C706 of these specifications and the sidewalk shall be finished with an exposed aggregate surface.

(b.) Item S-50 shall be measured and paid for on a per square yard basis at the bid price In the proposal. This price includes all labor, equipment and materials necessary to complete the work in accordance with the plans and specifications.

C1000.26 EXPOSED AGGREGATE DRIVEWAY (6" THICK) (ITEM S-51):

(a.) Work under this item consists of all labor, equipment and materials to furnish and install the exposed aggregate driveway (6" Thick) at the locations indicated on the Contract Drawings. Work under this item shall conform to all the requirements of Section C706 of the Standard Specifications of Roads and Bridges, 2006 Edition, except as amended by Section C706 of these specifications and the driveway shall be finished with an exposed aggregate surface.

(b.) Item S-51 shall be measured and paid for on a per square yard basis at the bid price In the proposal. This price includes all labor, equipment and materials necessary to complete the work in accordance with the plans and specifications.

END OF SECTION

STATE PROJECT NO. 742-36-0110
SPECIAL PROVISIONS TO SPECIFICATIONS

SECTION C1001 SPECIAL PROVISIONS

C1001.01 SPECIAL PROVISIONS TO SECTION 510 ASPHALTIC CONCRETE PAVEMENT PATCHING, WIDENING AND JOINT REPAIR

Section 510 of the Standard Specifications for Roads and Bridges, 2006 Edition, shall be amended as follows:

(a.) Section 510.05 MEASUREMENT, Paragraph (a). Add the following sentence after the first sentence:

"The new asphaltic concrete patching shall be twelve (12") inches thick."

(b.) Section 510.06 PAYMENT, Paragraph (a). The first paragraph is amended to read:

"Payment for pavement patching will be made at the contract unit prices per square yard (sq. yd.), with the asphaltic concrete twelve (12") inches thick, subject to the following provisions":

C1001.02 SPECIAL PROVISIONS TO SECTION C701 INSTALLATION OR REPLACEMENT OF DRAINAGE:

(a.) Section C701.01 GENERAL, Paragraph (g). The first sentence shall be deleted and replaced with the following sentence:

"Existing drain house connections shall be tied into the back of catch basins or tied into collector lines."

(b.) Section C701.02 INSTALLATION, First Paragraph. Add the following sentence at the end of the paragraph:

"The above referenced S&WB Standard Drawings are amended by the special detail "Typical Section of Concrete Storm Pipe Trench", included in the Contract Drawings."

(c.) Section C701.02 INSTALLATION, Third Paragraph, Item 1. The first sentence shall be amended to read "9" inches instead of "12" inches.

(d.) Section C701.02 INSTALLATION, Third Paragraph, Item 2. Item 2 shall be deleted.

(e.) Section C701.02 INSTALLATION, New Paragraphs. The following paragraphs shall be added following the last paragraph of this section:

"All excavations in excess of 4 feet shall be sheeted and, if necessary, braced. Sheeting shall be wood or steel for excavations above sand deposits. Tightly interlocked steel sheetpiles shall be used for excavations penetrating cohesionless deposits. Strut loads, sheeting material properties, and sheeting penetration will

depend on the excavation depth, width, excavation duration, construction techniques, and bracing system.

The construction contractor shall have the responsibility for adequacy of sheeting, bracing, and shoring systems. The design of these systems shall be made by a registered professional engineer. The construction contractor's engineer shall make an independent interpretation of subsoil conditions encountered at the boring locations from the soil boring logs included in the contract drawings. The design shall be submitted to the Engineer for review of adequacy and to evaluate the design's impact on adjacent structures. The responsibility for adequacy of sheeting, bracing, and shoring systems shall be the construction contractor's responsibility.

The dewatering system employed by the contractor during construction should be properly designed to maintain a dry, stable excavation in order to prevent lateral movement of the inplace soils. The subsidence and lateral movement of the soils surrounding an excavation should be controlled and minimized by careful attention to all details of excavation, bracing, dewatering, backfilling, and installation of sheeting. Removal of sheetpiles may result in additional settlement of the surrounding ground surface and structures. Therefore, all sheeting shall be left in place.

The base of the pipe trench or open cut for the pipes shall be cleared of all debris, water, and foreign matter. A geotextile ground stabilization and separator fabric shall be placed in the prepared excavations. Prior to pipe or fabric placement, the base of the excavation shall be inspected by the geotechnical engineer.

The geotextile fabric shall meet or exceed material requirements for Class C geotextile fabric as presented in Section 1019.01 of the Louisiana Standard Specifications for Roads and Bridges, 2006 edition, (LSSRB). Subsequent to clearing the excavation bottoms, the fabric shall be placed directly on the foundation lumber in accordance with the manufacturer's construction recommendations. Sufficient fabric shall be placed to line the excavation along its bottom and sides up to a level corresponding to the top of the bedding. The fabric shall extend horizontally between bedding and backfill materials.

Sump pumps shall be used to adequately dewater excavations founded in clay strata which are relatively impermeable. For excavations which will be founded in and over deposits of sandy silts and silty sands, it may be necessary to provide sufficient sheetpile penetration to cut off seepage into excavations. Relief of excessive hydrostatic pressures by the use of wells or wellpoints may also be necessary in these deposits.

Details regarding pumping capacity, seepage cutoff, or pressure relief methods are dependent on the size and depth of the excavations. The requirements for dewatering and seepage cutoff or pressure relief shall be part of the design submitted to the Engineer. Sump pumps will also be required to remove incidental seepage through sheetpiles and rainwater from construction areas.

The excavations shall be kept dry at all times during construction. However, it is recommended construction proceed expeditiously so the dewatering system can be used for the shortest period of time. This will minimize possible effects on adjacent

structures, particularly those bearing at the ground surface.

Dewatering or pressure relief operations may lower the ground water level in the immediate vicinity of the sheetpiles and result in settlement of the adjacent ground surface. The magnitude and lateral extent of ground settlement will depend in large measure on the duration of the dewatering or pressure relief operations. It is important that construction proceed without interruptions so these operations can occur for the shortest period of time thereby minimizing the effects on adjacent structures. The designer of the dewatering system shall evaluate its effect on adjacent structures and should take appropriate steps to minimize these effects.

Crushed stone fill shall be used as a bedding material, and shall comply with the material requirements of Section 1003.04 (a) of the Standard Specifications for Roads and Bridges, 2006 edition. The crushed stone shall be compacted to 75% of its relative density in accordance with ASTM D 4253 and 4254.

The compacted bedding materials shall extend upward from the excavation bottom along the haunches and sides of the pipe up to a horizontal plane halfway up the barrel of the pipe. The bedding shall have a minimum width greater than the outside diameter of the pipe on each side as shown on special detail "Typical Section of Concrete Storm Pipe Trench", included in the Contract Drawings.

Particular attention shall be paid to ensure bedding material is well compacted and securely supporting the pipe at its haunches. This compaction is best achieved with hand tamping the bedding material beneath the pipe haunches.

Select sand fill used as backfill shall consist of locally available, hydraulically dredged and pumped river sand. Select sand fill shall be non-plastic material free of all roots, wood, clay lumps, and other deleterious materials, and shall have no more than 10% by weight of material passing a U.S. Standard No. 200 mesh sieve.

When used as backfill, the select sand fill materials shall be placed in lifts of up to 9 inches loose measure and uniformly compacted with a power tamper to 95% of maximum dry density near optimum water content in accordance with ASTM D 698. For sand fill which is used to replace excavated soils in excess of the minimum required bedding thickness, the required density shall be 93% of ASTM D 698.

Where pavements or structures will overlie the pipe trench, the select sand fill material 12 inches directly beneath the pavement shall be placed in two lifts and compacted to a minimum density corresponding to 98% of maximum dry density determined in accordance with ASTM D 1557."

(f.) Section C701.03 DRAIN HOUSE CONNECTIONS, First Paragraph. The first paragraph shall be deleted and replaced with the following paragraph.

"All existing drain house connections that are connected to an existing drain line to be removed, shall be removed from the existing drain line to one (1) foot behind the required curb where the existing house connection shall be tied to a required collector line."

(g.) Section C701.03 DRAIN HOUSE CONNECTIONS, Second Paragraph. The second paragraph shall be deleted.

(h.) Section C701.04 POINT REPAIRS OF EXISTING DRAIN LINES, First Paragraph. Add the following sentence to the end of the paragraph:

"The above referenced S&WB Standard Drawings are amended by the special detail "Typical Section of Concrete Storm Pipe Trench", included in the Contract Drawings."

(i.) Section 701.07 MEASUREMENT, Add the following items to the end of the paragraph:

"(a) Fabricating of pipe tees, elbows and other fittings will be measured per each fitting. The length of the pipe in such fittings will be included in the pay length measurement of pipes of which they form a part".

"(b) Excavation required for installation of pipe will not be measured for payment, except as otherwise specified in Subsection 203.14".

"(c) Furnishing and placing backfill material below existing ground level for pipes will not be measured for payment. Backfill material needed to complete backfill above natural ground and around pipes that extend above natural ground will be measured and payment will be made under applicable earthwork items. When specified, flowable fill will be measured and paid for in accordance with Section 710".

"(d) Plugging and stubbing of pipes will not be measured for payment".

(j.) Section C701.08 PAYMENT, Delete Paragraph (a) and replace with the following:

"Payment for reinforced concrete pipe shall be made at the contract unit price, per linear foot of the types and sizes specified, including excavation, removal of existing pipe (if any), engineering fabric, backfill, complete shoring, pumping as necessary and tie-ins to existing manholes and catch basins. See Bid Item Nos. 701-03 or 701-04. Payment for foundation lumber shall be made at the contract unit price per Bid Item No. S-48; Payment for bedding materials shall be made at the contract unit price per Bid Item No. 726-01".

(k.) Section C701.08 PAYMENT, Delete the first paragraph of subparagraph (b) and replace with the following:

"Payment for reinforced concrete wye or tee in new drain line shall be made at the respective contract unit price per Bid Items Nos. 701-09-M-E; 701-09-O-E; 701-09-P-E; 701-09-Q-E; and 701-09-Q-I and shall be in addition to the payment per linear foot for reinforced concrete drain pipe".

(l.) Section C701.08 PAYMENT, Delete Paragraph (e). See Special Bid Items Section C1000.19.

(m.) Add Section C701.09 DRAIN LINE TIE-IN THE EXISTING CONCRETE BOX CULVERT. Add the following Section to Section C701:

"C701.09 DRAIN LINE TIE-IN TO EXISTING CONCRETE BOX CULVERT

The contractor shall furnish all labor, materials, equipment and supervision required for the tie-ins to the existing reinforced concrete box culvert. The water in the existing box culvert cannot be completely drawn down and standing water may be encountered in the box during construction. The contractor shall be responsible for adequately constructing a cofferdam and dewatering operations during construction within the box culvert at no direct payment.

Temporary Dams: The contractor shall not be allowed to impede existing or new drainage during rainstorms or when a storm is imminent.

(1) The contractor may construct temporary dams to permit dewatering for construction. The contractor shall submit to the Chief of Engineering of the Sewerage and Water Board, the location and elevations of any temporary dams he proposes to erect and receive the Chief of Engineering's approval prior to placing such temporary dams. However, upon orders at any time from the Engineer or the Sewerage and Water Board these dams must be removed within one (1) hour of notification to permit storm water through the construction area. The contactor may be allowed to provide a suitable by-pass around the temporary dam. However, this by-pass shall require prior approval of the Chief of Engineering of the Sewerage and Water Board.

(2) The Contractor shall also be responsible for keeping all existing lines from drainage systems flowing at all times.

(3) The Contractor shall file with the Engineer and the Sewerage and Water Board the names and phone numbers of personnel who are available on a 24 hour basis for removing these dams and any impediment to drainage within the construction area."

The contractor shall submit to the Engineer and to the Chief of Engineering of the Sewerage and Water Board, drawings prepared under the supervision of a registered professional engineer, detailing the design and methods the contractor proposes to use to accomplish this item of work for approval prior to commencement of this item of work.

Plans of the existing reinforced concrete box culvert are available at the Sewerage and Water Board of New Orleans.

C1001.03 SPECIAL PROVISIONS TO SECTION C706 DRIVEWAYS AND SIDEWALKS:

Section C706.09 PAYMENT. Add the following sentences:

"Payment for Concrete Walk shall be made at the contract price per square yard under Bid Item No. 706-01-A".

"Payment for Concrete Drive shall be made at the contract price per square yard under Bid Item No. 706-02-C or 706-02-E".

"Payment for Incidental Concrete Paving shall be made at the contract price per square yard under Bid Item No. 706-03-C".

C1001.04 SPECIAL PROVISIONS TO SECTION C707 CURBS AND GUTTERS:

Section C707.11 PAYMENT. Add the following sentence:

"Payment for Concrete Curb shall be made at the contract price per linear foot under Bid Item No. 707-01".

C1001.05 SPECIAL PROVISIONS TO SECTION C741 – INSTALLATION OR REPLACEMENT WATER MAINS UP TO 12" IN DIAMETER (REVISED)

(a.) Section C741.02 MATERIALS AND METHODS, Paragraph (j.), Item 1. The first sentence shall be amended to read "9" inches instead of "12" inches.

(b.) Section C741.02 MATERIALS AND METHODS, Paragraphs (j), Item 2. Item 2 shall be deleted.

(c.) Section C741.07 PAYMENT, Add subsection (d) as follows:

"(d) Payment for the 6" Water Line Offset shall be made at the contract price per each under Bid Item No. S-11; Payment for the 12" Water Main (PVC) With Main Line Fittings shall be made at the contract price per linear foot under Bid Item No. S-12; Payment for the New Manhole Around Existing Water Valve shall be made at the contract price per each under Bid Item No. S-13; Payment for Replace ¾" House Connection (From Main to Meter) shall be made at the contract price per each under Bid Item No. S-14; and Payment for Replace 1" House Connection (From Main to Meter) shall be made at the contract price per each under Bid Item No. S-15".

(d.) Add the following section to Section C741:

"C741.08 REMOVAL AND DISPOSAL OF EXISTING ASBESTOS CEMENT WATERLINES

(a.) DESCRIPTION

The Contractor shall be required to remove, containerize, transport and dispose of existing asbestos cement waterlines within the limits detailed on the contract drawings or as directed by the Engineer, all in accordance with the plans and these specifications.

(b.) GENERAL

The Contractor shall carefully remove and dispose of all existing asbestos cement water lines without excessive breaking, crushing or damage in accordance with Subsection 202.02 of the Louisiana Standard Specifications for Roads and Bridges, 2006 Edition. The asbestos cement waterlines require special handling. All asbestos cement materials removed shall become the property of the Contractor. The Contractor shall be responsible for all necessary permits and approvals required to handle, remove, and dispose of this material.

In addition, the contractor is required to comply with all applicable codes, laws, and regulations by federal, state, and local authorities for this work, including, but not limited to the following:

OSHA	29 CFR 1910.1001; "Occupational Exposure to Asbestos, Tramolite, Anthophyllite and Actionolite"
	29 CFR 1926.1101; "Subpart Z Toxic and Hazardous Substances-Asbestos"
USDOT	49 CFR 171 and 172; "Hazardous Substances"
USEPA	40 CFR 763, Subpart E, Appendix C; "Training Requirements of (AHERA) Regulation"
LDEQ	LAC 33: III. Chapter 27, Appendix A; "Agent Accreditation Plan"
	LAC 33: III. Chapter 51, Subpart M, Section 5151; "Notification of Demolition and Renovation, form AAC-2"
	LAC 33: I. Chapter 39; "Notification"

Louisiana Contractor Licensing Board

LAC 37: I. Chapter 24; "Contractor Licensing"

The Contractor shall maintain, and furnish to the Owner, Chain of Custody verification records for the asbestos material from the work site to the disposal site at No Direct Payment.

(c.) EXCAVATION AND BACKFILL

The Contractor will be responsible for determining if sheeting and bracing

will be necessary for the excavation to ensure stability. Any sheeting placed shall be removed or cut off to an elevation 3 feet below existing ground and left in place.

The Contractor shall be responsible for properly securing and marking the excavation site to maintain public safety at all times, in accordance with all applicable laws, regulations, and the contract plans and specifications. The Contractor shall be responsible for restoring the excavation site to original conditions as necessary as quickly as possible.

Excavation necessary for removal of the asbestos cement waterline will be at No Direct Payment. All excavated material that does not conform to the requirements of Subsection 203.06(a) of the Louisiana Standard Specifications for Roads and Bridges, 2006 Edition shall be disposed of in accordance with Subsection 202.02 of the same specifications at No Direct Payment. Remaining excavated material may be either stockpiled on site or disposed of offsite at No Direct Payment. Subject to approval by the Project Engineer, stockpiled material may be used as fill material on the project site.

Backfill shall be granular material placed as per the plan details and Subsection 701.08 of the Louisiana Standard Specifications for Roads and Bridges, 2006 Edition at No Direct Payment.

(d.) MATERIAL

The Contractor shall provide all necessary materials and equipment necessary to complete all work associated with this section.

(e.) MEASUREMENT

No separate measurement shall be made for removal and disposal of various sizes of asbestos cement waterlines. There will be no separate measurement made for obtaining all required permits, designing, installing, and removing temporary sheeting and bracing, performing excavation and supplying and installed backfill.

(f.) PAYMENT

No separate payment shall be made for this item. The cost to provide all labor, equipment, and material necessary for removal and disposal of asbestos cement waterlines including procurement of permits, design installation, and removal of sheeting and bracing, excavation, backfill, etc. shall be included in the unit price bid per linear foot of new water line installed.

The Contractor shall include an allowance of two hundred (200) linear feet for removal and disposal of asbestos cement waterline as part of the Bid price. Should the quantity of removal and replacement of asbestos cement water lines exceed the allowance of two hundred (200) linear feet, the Contractor shall be compensated in accordance with Section 109.04 of the Louisiana Standard Specifications for Roads and Bridges, 2006 Edition.

C1001.06 SPECIAL PROVISIONS TO SECTION C742 - INSTALLATION, REPLACEMENT, AND RESTORATION OF SEWER SYSTEMS (REVISED)

(a.) Section C742.03 INSTALLATION AND REHABILITATION OF SEWER MAINS, SUBSECTION (b). MATERIALS AND METHODS, Seventh paragraph, Item 1. The first sentence shall be amended to read "9" inches instead of "12" inches.

(b.) Section C742.03 INSTALLATION AND REHABILITATION OF SEWER MAINS, Subsection (b) MATERIALS AND METHODS, Seventh paragraph, Item 2. Item 2 shall be deleted.

(c.) Section C742.05 PAYMENT, Paragraph (f), the phrase per Item No. C742(60) shall be replaced with the phrase "per Item No. S-16".

(d.) Section C742.05 PAYMENT, Paragraph (i), the phrase per Item No. C742(63) shall be replaced with the phrase "per Item No. S-17".

END OF SECTION

SECTION C1404 - TRAFFIC SIGNAL ITEMS

C1404.01 CONCRETE FOUNDATIONS:

(a) General: Concrete foundations shall be installed as shown and described in the Plans. This work shall include all necessary excavations, forming, placing of reinforcement steel, placing of anchor bolts, placing of ground rods, placing of conduits, pouring of concrete, neatly finishing exposed areas of concrete, backfilling, removing excess materials and cleaning up the work area when completed. This work shall also include sizing foundations for the support poles described herein. The Contractor shall furnish all materials and equipment to complete the installations as shown and described in the Plans.

(b) Ground Wire and Ground Rods: Ground rods shall be of copper-weld or an equivalent rust-resisting material of the length and diameter shown on Plans. Clamps for ground rods shall be copper. Ground wire shall be AWG No. 6 bare copper wire.

(c) Concrete: Concrete for bases shall be Class A concrete conforming to Section 901 of the Standard Specifications.

(d) Reinforcement Steel: Reinforcement steel shall conform to Section 806 of the Standard Specifications.

(e) Anchor Bolts: Anchor bolts for concrete foundations shall be provided by the Contractor and shall conform to the foundation detail drawings and specifications contained herein.

(1) Pedestal Pole Bases: Anchor bolts for pedestal bases shall be 19 mm by 450 mm. Four (4) anchor bolts are required per concrete base. Each anchor bolt shall be supplied with two nuts and two flat washers. The embedded end of anchor bolts shall have a 75 mm L bend, and the exposed end shall have a minimum of 100 mm of threads. Anchor bolts shall conform to ASTM-A36 and shall be galvanized to conform to ASTM-A153.

(2) Mast Arm Pole Bases: Anchor bolts for mast arms shall conform to the requirements of AASHTO M314 Grade 55. The upper 305 mm of the bolts shall be hot dip galvanized per ASTM A153. Each anchor bolt shall be supplied with two hex nuts and two flat washers. The strength of the nuts shall equal or exceed the proof load of the bolts. A cast nut cover shall be provided for each anchor bolt. Each nut cover shall be attached to the pole with a stainless steel hex bolt, as shown in the Plans.

(3) Controller Cabinet Base: Anchor bolts for the controller cabinet base shall be 19 mm X 450 mm. Four (4) anchor bolts are required per controller cabinet base. Each anchor bolt

shall be supplied with 2 nuts and 2 flat washers. The embedded end of the anchor bolt shall have a 50 mm L bend. The bolt shall conform to ASTM-A36 and shall be galvanized to conform to ASTM-A153.

(f) Installation: The Contractor shall size foundations to support the total load presented at each location, including the pole, arm (where applicable), and signal heads. The foundations shall include conduit sweeps to accommodate all proposed conduits entering the pole, plus one additional spare conduit. Foundations shall be poured monolithically. Exposed portions shall be formed to present a neat appearance. The bottom of concrete foundations shall rest on firm undisturbed ground.

Forms shall be true to line and grade. Tops of footings for posts and standards, except special foundations, shall be finished at curb-to-sidewalk grade or as directed by the Engineer. Forms shall be rigid and securely braced in place. Conduit ends and anchor bolts shall be placed in proper position and to proper heights, and shall be held in place by means of a template until concrete sets.

Both forms and ground which will be in contact with the concrete shall be thoroughly moistened before placing concrete. Forms shall not be removed until the concrete has thoroughly set.

Ordinary surface finish shall be applied to exposed surfaces of concrete. When the edge of a concrete foundation or sidewalk section is within 450 mm of any existing concrete improvement, the sidewalk section shall be extended to meet said improvement.

Where obstructions prevent construction of planned foundations, the Contractor shall construct a foundation satisfactory to the Engineer whose price shall be full compensation for labor, equipment, materials and other necessary appurtenances required for a complete installation.

C1404.02 TRAFFIC SIGNAL POLES:

Traffic signal poles shall be constructed in accordance with the details in the Plans and as described below:

(a) Pedestal Poles: The pedestal base shall be constructed of cast iron or aluminum and shall be a minimum of 330 mm square at the bottom and a minimum of 380 mm high. The upper end of the base shall be threaded to accept a 115 mm O.D. pipe shaft. The pole shall be hot dip galvanized and powder coated in accordance with Section 1408.

The base shall contain a removable door to allow access to anchor bolts and to permit cable splicing. The door shall be a minimum of 200 mm X 200 mm and shall then be fastened to the base by means of a stainless steel hex head screw into a threaded hole in the base. The shaft shall be 100 mm standard steel pipe (108 mm O.D.) meeting ASTM Designation A53G.

The shaft shall be threaded on one end to screw into the base. The overall length of the pedestal (shaft plus base) shall be 3.1 m.

The pedestal shaft shall be installed plumb in all directions plus or minus 25 mm of the top. Shims will not be permitted on pedestal foundations to achieve plumbness. Pedestal bases shall be grouted with non-shrink grout after the shaft has been plumbed.

(b) Mast Arm Poles: Mast arm poles shall consist of a tapered pole, tapered signal mast arm(s), anchor bolts, and base plate.

(1) Pole: The pole shall be fabricated from coil or plate conforming to ASTM A595 Grade A with a minimum yield strength of 379.5 MPa or ASTM A572 with a minimum yield strength of 45 MPa. The pole shall be round in cross section and have a constant linear taper of 11.64 mm/m. The shaft shall be one piece, and contain no circumferential welded butt splices. Laminated tubes are not permitted. The pole shall have a reinforced 102 mm by 165 mm handhole with cover located 460 mm from the pole base. At mast arm connections, the pole diameter/thickness ratio (D/t) shall not exceed 52 for A595 Grade A tubes or 66 for A572 Grade 65 tubes. Each pole shall be provided with a zinc die cast end cap secured in place with set screws or a cap plate secured with a 19 mm diameter bolt, flat washer and mounting bar. The pole shall be hot dip galvanized and powder coated in accordance with Section 1408.

(2) Mast Arm: The mast arm shall be fabricated from coil or plate conforming to ASTM A595 Grade A with a minimum yield strength of 379.5 MPa. The arm shall be round in cross section and have a constant linear taper of 11.64 mm/m. All mast arms shall be manufactured and shipped in one piece, and have a minimum wall thickness of 4.5 mm. Circumferential welded tube butt splices and laminated tubes shall not be permitted. Each arm shall be provided with a zinc die cast end cap secured in place with set screws. The mast arm shall be hot dip galvanized and powder coated in accordance with Section 1408.

(3) Base Plate: Base plates shall conform to ASTM A36 or ASTM A572 Grade 42. Plates shall be integrally welded to the tubes with a telescopic welded joint, and shall be hot dip galvanized and powder coated in accordance with Section 1408.

(4) **Double Mast Arm Installations:** Where a double/dual mast arm installation is shown in the Plans, the first or higher arm shall be installed on primary parade route main street approaches as directed by the Engineer. For all double/dual mast arm installations, the Contractor shall submit for approval a sketch indicating the attachment height of both arms and the vertical clearance between signal housing and pavement grade for each respective approach.

C1404.03 TRAFFIC SIGNAL HEADS:

(a) General Requirements: All traffic sections shall be of the adjustable type. Materials and construction of both types of sections shall be the same. Heads shall conform to the ITE Standard for "Adjustable Face Vehicular Traffic Control Signal Heads", latest edition. The number of sections per face shall be as shown on Plans. All signals shall be mounted vertically, except on mast arms, where they shall be mounted horizontally or vertically, as shown on the Plans.

(b) Housing: The housings shall be made of cast aluminum. If die cast they shall be made of either Alloy SS or Alloy SG3 of ASTM Specification BS5; if sand cast, they shall be made of Alloy SI of ASTM Specification B26.

All cast metal parts shall have a tensile strength of not less than 117 MPa and shall be clean, smooth and free from flaws, cracks, blowholes and other imperfections.

Housings shall be sectional and each face shall consist of as many sections as there are optical units, together with a suitable top and bottom, all sections being rigidly and securely fastened together into one weather tight signal face.

Each face shall be arranged with round openings (slip-fit for 38 mm conduit) in the top and bottom so that it may be rotated a complete unit between waterproof supporting brackets or trunnions and thus be capable of being directed and locked at any angle in the horizontal plane. Serrations, detents, bolts or similar locking devices are required; friction will not be deemed an acceptable lock. These locks shall be such that any face will resist a torque of 6 N·m when assembled in accordance with manufacturer's recommendations.

The portion of the housing adjacent to the bracket shall be properly reinforced so as to have sufficient strength against breakage from shock. Seals, gaskets, labyrinths or a suitable combination of same shall be provided at bracket attachment points and at section joints to ensure water shedding. Supporting brackets or trunnions shall be used at top and bottom of section assembly to rigidly support all faces.

The bracket at the supported end of the signal section shall be of 38 mm conduit or of an equivalent inside clearance for wiring. The bracket at the opposite end of the section may be either the same as the top or of solid construction. A set screw engaging a drilled hole shall be provided at each joint on the bracket where conduit type joints are used or an equivalent locking device shall be provided.

All edges shall be deburred and smooth with no cutting edges.

(c) Housing Door: The doors shall be cast aluminum and shall be suitably hinged and held securely to the body of the housing by simple non-corrosive locking devices which can be operated without tools. All other door parts, such as hinge pins, lens, clips, etc., shall also be stainless steel. Door hinge pins shall be so designed that the door will not accidentally become disconnected from housing when open regardless of signal position. Doors shall be field removable with simple tools.

Weather-resisting, mildew-proof neoprene or silicone rubber sponge gasketing shall be provided between the body of the housing and the doors in order to exclude dust and moisture.

(d) Visors: Each signal section shall have a visor which tilts downward approximately 8 degrees from the horizontal. The visor shall be of sheet construction of aluminum alloy not less than 1.3 mm (No.20 -18 U.S. Gauge) in thickness, or plastic (when specified). All edges shall be deburred and smooth with no cutting edges.

Tunnel visors shall be provided unless otherwise shown on Plans. The visor shall be attached to the door with stainless steel screws and shall be designed to fit tightly to the door and shall not permit any perceptible filtration of light between the door and the visor.

(e) Backplates: Traffic signal backplates shall be specifically manufactured for the type

and brand of signal heads used to ensure proper fit with a border width of 125 mm. The backplates shall be without louvers and shall be of one-piece construction with the exception of those five-section cluster signal heads, which may be a maximum of five pieces.

(f) Optical Units: The optical units shall be comprised of LED modules as specified in Section 1414.

(g) Mounting: Signal sections and beacon sections shall be suitable for one of the following standard mounts, the type mount for each to be specified in the Plans.

(1) Pedestal Mounting. The pole shall be furnished with a slip fitter for placement on a 100 mm I.D. pipe pedestal with set screws for correct aligning of the signal. Provisions for base feed shall be incorporated into the design of the section assembly.

The section bracket assembly shall incorporate a weatherproof terminal compartment or box with a removable cover allowing complete access. The box shall be of suitable size to accommodate, and shall come equipped with, a terminal strip with terminals equal to the number of signal indications in the section plus one or more for common. The terminal compartment shall be neat in appearance and shall be adjacent to or near the pedestal mount. In no case shall feed wires be required to pass through a signal section or face to reach the terminal compartment. A terminal compartment integral with the bracket shall be permitted.

(2) Mast Arm Signal Brackets: Brackets and hardware for mounting traffic signals on mast arms shall be provided by the Contractor. Brackets shall be "Astro-Brac" type or approved equal, and shall accommodate the mounting of horizontal or vertical traffic signals at the locations shown on the Plans. Stainless steel banding shall be used for attachment of the brackets on mast arms. Brackets shall provide a rigid mounting of signal to mast arm to facilitate proper aim of traffic signals. The bracket shall be made of aluminum or other approved rust-proof materials.

Supporting brackets, trunnions and fittings may be made of cast aluminum or cast iron. All parts made of ferrous materials shall be treated to resist corrosion.

(h) Installation: Signal heads of the various types and mountings shall be installed at locations indicated on the Plans or directed by the Engineer. Ample signal cable slack shall be left in the signal for field adjustment of the signal head.

The Contractor shall complete all wiring of signal heads using spade lugs on each conductor and terminate conductors on the terminal strips provided in disconnect blocks, terminal compartments or signal heads. All work shall be neat and to the satisfaction of the Engineer.

C1404.04 PEDESTRIAN SIGNAL HEADS: Pedestrian signal heads shall be made of plastic, nonferrous metal, or a combination thereof. They shall conform to the ITE Standard for Vehicle Traffic Control Signal Heads except the number of sections in an

assembly shall be one, and shall provide indications for the universal symbols of "Walk" and "Don't Walk".

C1404.05 LOOP DETECTOR:

(a) General: Loops shall be of the size and shape indicated in the Plans. Each system loop shall detect only one lane of traffic. The loop shall be centered in the lane and located as shown in the Plans. All detected lanes for the detected direction shall be separately detectorized. The Contractor shall be required to maintain loops which he installs for the duration of the project. Loop construction shall be in conformance with the details in the Plans and these Special Provisions.

(b) Saw Cut: Loop detectors shall not be installed in pavement that has been open cut, repaired, or rebuilt in a manner where the pavement structure is not sound and continuous in the area of the proposed loop installation. The Contractor shall first field inspect the loop locations and advise the Engineer of any such locations that have been open cut, repaired, or rebuilt. The Engineer will direct the Contractor in locating the loop detectors.

The Contractor shall mark the location of loops and get the approval of the Engineer prior to sawing the slot. A 305 mm separation shall be maintained between all loop wire saw slots wherever possible. Loop wire shall be installed in saw cuts in the roadway made by a diamond or abrasive power saw. The slot width and depth shall be as indicated on the Plans; however, in all cases, the slot shall be of sufficient depth to provide for a minimum of 25 mm cover between the top of the loop wires and the roadway surface.

The saw cuts shall be overlapped so that the slot has full depth at all corners. All corners where loop wires turn shall be diagonally cut so that there are no jagged edges or protrusions which may damage the wire.

Prior to installation of the wire, the saw cuts shall be cleaned and dried using oil-free compressed air. There shall be no cutting dust, grit, oil, moisture or other contaminants in the saw cut.

(c) Loop Wire: Loop wire shall be AWG #14 stranded Type XHHW gasoline and oil resistant single conductor insulated for 600 volts. XHHW wire shall meet the requirements of the latest editions of NEMA Standard WC-7, the NEC, and IMSA 51-3. The loop wire shall not have any cuts, nicks, abrasions or breaks in the insulation before or after installation in the slot. Any wire having defects in the insulation shall be replaced at the Contractor's expense.

Loop wire shall be one continuous length of wire with no splices. Loop wire from the curb or edge of pavement to the junction box shall be installed in a 25 mm conduit sweep. The loop wire for each loop shall be run in separate saw cuts from the loop to the junction box.

All loop wire lengths, including lengths in conduit and junction boxes, which are not imbedded in the pavement slot, shall be twisted with at least fifteen (15) turns per meter, and taped at one meter intervals.

The wire shall be placed in the bottom of the slot so that there are no kinks, curls,

straining or stretching of the insulation. Subsequent turns of the loop shall be placed to assure vertical stacking of the wires.

Special care shall be taken in seating the wires so that the insulation will not be broken or abraded. No sharp tools such as a screwdriver or metal object shall be used for this operation.

Loop location and configuration shall be as shown on the Plans unless otherwise directed.

(d) Loop Sealant: All saw cuts with the wire installed shall be inspected and approved by the Engineer before the sealer is installed.

The sealant shall be 3M, Bondo P-606, Preco Loop Sealant or an approved equal. The sealant shall be a one- or two-component sealant designed specifically for sealing detector loops in concrete or asphalt. It shall have satisfactory compressive strength to bridge the saw cut under traffic, but remain flexible to compensate for thermal contraction or expansion.

The Contractor shall install the sealer in strict adherence to the manufacturer's recommendations and these specifications. Do not apply the sealant when the air temperature is below 7°C, or during precipitation.

The viscosity of the sealer shall be such that it can be readily poured into the slot, completely surround the wires, displace all air and fill the slot so that the sealer is flush with the roadway surface. The finished sealed slot shall be waterproof and present a neat workmanlike appearance.

The sealer shall be sufficiently hardened as per manufacturer's specifications, before allowing traffic on it.

(e) Detector Lead-in Cable: Each system loop shall have its own, separate lead-in cable. Detector lead-in cable shall be shielded and shall conform to IMSA Specification 50-2, AWG #14.

Lead-in cable shall be installed in a continuous run from the loop wire splice in the curbside junction box to the cabinet mounted terminal strip allocated for detector lead-in cable termination. No splices shall be allowed between these points. The Contractor shall take adequate measures to protect cable from damage during handling and installation.

All splices in junction boxes must be carefully made to insure constant low resistance, and must be insulated by means of a plastic casting splice kit to render a waterproof joint. Connections shall be soldered. The shielded drain wire in the junction box shall be cut off flush and waterproofed so as not to come in contact with the junction box or ground. The shielded drain wire shall be terminated with a ground wire and solidly grounded at the amplifier.

All detector lead-in cable shall be tagged with sleeve labels to identify each cable with its associated loop location and cabinet terminal number. The detector lead-in cable shall be labeled both inside the controller cabinet and inside the junction box. The legend shall be clear and readable and shall not deteriorate with exposure to dirt, water, sun or other conditions found in controller cabinets. The legend shall be firmly and securely fixed to the lead-in cable near the cable termination. The Contractor shall provide the Engineer with an

as-built record of each detector lead-in installed and for each vehicle detector amplifier installed. This record shall be in a format approved by the Engineer.

C1404.06 MICROWAVE DETECTOR ASSEMBLY:

(a) General Requirements: The Contractor shall install microwave detector assemblies on signal mast arms at locations shown in the Plans, and shall furnish two additional units, and deliver them to the signal shop. The microwave detector assembly shall consist of a microwave detector unit, all necessary mounting hardware, and setup programming required to provide a fully functional system detector station. Microwave detector assembly construction shall be in conformance with the details in the Plans and these Special Provisions.

(b) Functional Requirements: Detector units shall be true presence detectors which have the capability to measure presence, volume, lane occupancy, and speed for up to six discrete detection zones. The detection zones shall be user definable and programmable with an external notebook PC. Any PC software required for setup and testing shall be supplied on an MS-DOS compatible diskette. Microwave detector units shall have a detection range of 3 to 61 meters.

Detector units shall transmit on a frequency band of 10.525 Ghz +/- 25 MHz with transmitter power not exceeding 10 milliwatts. The detector unit shall comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules for the appropriate Spectrum Management Authority.

(c) Mechanical Requirements: The detector units shall be enclosed in a rugged weatherproof NEMA 4X enclosure. The dimensions of the unit shall not exceed 205 mm x 255 mm x 155 mm. The total weight of the unit shall not exceed 7 kilograms.

A mounting assembly shall be provided for each detector unit, made of stainless steel or aluminum. The mounting assembly shall be capable of supporting a load of 10 kilograms; and shall be approved by the manufacturer of the microwave detector. The mounting assembly shall incorporate a ball-joint, or other approved mechanism, that allows the detector unit to be tilted in any direction and locked into place.

(d) Electrical Connection and Detector Interface: The Contractor shall furnish and install a single twisted pair control cable meeting the requirements of Section 1406 between the controller cabinet and each microwave detector. The cable shall be UV-resistant and rated for 300 volts. On the back of the detector, the Contractor shall terminate the cable on a single MS connector which provides power, serial communications, and a contact closure output for each detection zone. The Contractor shall crimp the MS connector pins to the cable conductors, and perform a continuity test on the cable before installing it. The Contractor shall route the cable from the detector into the mast arm (using a watertight fitting), and shall extend the cable through the pole into the foundation conduits, and then to the controller cabinet. Inside the controller cabinet, the Contractor shall terminate wire pairs used for power and detection on a terminal block, and make the necessary

connections to the cabinet's power supply and the detection input to the controller. The pairs used for RS-232 communications shall be spliced to a female 9-pin RS-232 connector, and shall be secured to the side wall of the cabinet such that a laptop computer can be easily connected to it for set-up and programming. Unused wire pairs shall be capped.

(e) Installation: The Contractor shall position the detector so that the detection zones are centered in the target lane and are the correct distance from the intersection, as shown in the Plans.

When installing the detector units, the Contractor shall perform all the setup activities and tests recommended by the manufacturer, in the presence of the Engineer. The Contractor shall record all setup parameters and place them with the wiring diagram in the controller cabinet.

After the first unit is installed and fully operational, and before the system acceptance tests, the manufacturer of the microwave detectors shall provide at least four hours of hands-on training. The training shall be on-site and shall cover the setup, calibration, operation and maintenance of the detector units, as well as their interface with the controller.

C1404.07 REMOVAL AND SALVAGE: The Contractor shall remove existing traffic signal equipment as shown in the Plans. Equipment that is removed, including signal heads, poles, mast arms, preemption devices, cabinets, controllers, conflict monitors, and plug-in devices (load switches, relays, etc.) shall be salvaged. Foundations, risers, field wire and cable which are removed and not reused shall become the property of the Contractor and shall be disposed of properly. Materials to be salvaged will remain the property of the City, and shall be transported by the Contractor to the Signal Shop, at 2832 Lafitte Street, New Orleans, Louisiana between the hours of 7:30 am and 3:00 pm, Monday through Friday. All materials to be salvaged shall remain in the custody of the Contractor until such time as they are delivered to the City.

The Contractor shall not damage any salvaged material and shall be required to, if requested, demonstrate to the Engineer that such material is indeed in working order. The Contractor shall restore or replace, at his own expense, any salvaged material which is damaged by his operations. All material shall be tagged with a label specifying the location from which the material was removed.

C1404.08 REMOVAL AND REPLACEMENT: Existing facilities such as sidewalks, curbs, gutters, pavement, etc. that are removed, broken or damaged by the Contractor, shall be replaced or reconstructed in kind. When a part of a square or slab of existing concrete sidewalk or driveway is broken or damaged, the entire square or slab shall be removed and replaced in kind.

C1404.09 MEASUREMENT AND PAYMENT:

(a) Signal Support (Type) (Size/Configuration) will be measured in units of each and paid for at the contract unit price per each. This price shall include fabricating, furnishing and installing the signal support, including the pole, foundation, anchor bolts and plates, and miscellaneous hardware required for a complete installation.

(b) Traffic Signal Head (Type, Size) will be measured in units of each and paid for at the contract unit price per each. This price shall include furnishing and installing the signal head, including mounting brackets, and miscellaneous hardware required for a complete installation.

(c) Pedestrian Signal Head (1-Section) will be measured in units of each and paid for at the contract unit price per each. This price shall include furnishing and installing the pedestrian head, including mounting hardware, pushbutton detectors, and miscellaneous hardware required for a complete installation.

(d) Removal of Existing Signal Equipment will be paid for on a lump sum basis. The price shall include removal of all existing signal equipment as shown in the Plans and as described above; and storage and delivery of equipment to the Signal Shop, at 2832 Lafitte Street, New Orleans, Louisiana.

(e) Loop Detector will be measured in linear meters of sawn slot and paid for at the contract unit price per meter. This price shall include sawing, installed wire (3 turns), and sealing. Measurement will be made from the edge of the pavement and once around each loop perimeter.

(f) Microwave Detector Assembly will be measured in units of each and paid for at the contract unit price per each. This price shall include furnishing and installing the detector unit, including mounting assembly, interface equipment, and miscellaneous hardware required for a complete installation.

(g) Detector Lead-in Cable (Size) will be measured in meters and paid for at the contract unit price per meter. This price shall include furnishing, installing, and testing the detector lead-in cable, including all conductors, markings and identification, terminal blocks, connections, splices, and furnishing all materials, labor, tools, equipment and incidentals necessary to complete the work.