PROJECT MANUAL FOR
MIDWAY ROAD DRAINAGE IMPROVEMENTS
FROM GREENHILL DRIVE
TO T.U. ELECTRIC R.O.W.
FOR
TOWN OF ADDISON, TEXAS

Espey, Huston & Associates, Inc.
Engineering & Environmental Consultants

Bid Set

Document No. 950879
EH&A Job No. 16285

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FROM GREENHILL DRIVE
TO T.U. ELECTRIC R.O.W.
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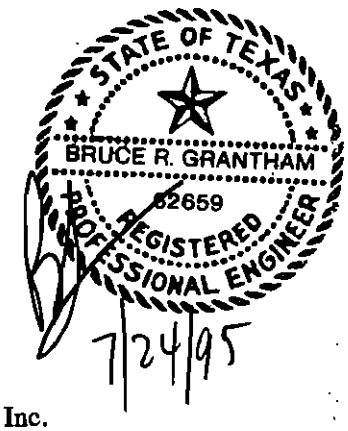
Prepared for:

Town of Addison
P. O. Box 144
Addison, Texas 75001



7/24/95

Prepared by:

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July 1995

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SECTION AB

ADVERTISEMENT FOR BIDS

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ADVERTISEMENT FOR BIDS

1. Sealed bids addressed to the Town of Addison, Texas, for Midway Road Drainage Improvements, Greenhill Drive to T.U. Electric R.O.W., for the Town of Addison, Texas, hereinafter called "City" in accordance with plans, specifications and contract documents prepared by Espey, Huston & Associates, Inc., will be received at the office of Clyde Johnson, Purchasing Manager, Finance Building, 5350 Belt Line Road, Addison, Texas until 2:00 p.m. on the 10th day of August 1995. Bids received by the appointed time will be opened and read aloud. Any bids received after closing time will be returned unopened.

2. A pre-bid conference will be held at 9:00 a.m. on the 3rd day of August 1995. The conference will be at the Addison Service Center, 16801 Westgrove, Addison 75248. Attendance is highly recommended; however, attendance at the conference will be voluntary.

3. The Contractor shall identify his bid on the outside of the envelope by writing the words TOWN OF ADDISON MIDWAY ROAD DRAINAGE IMPROVEMENTS, GREENHILL DRIVE TO T.U. ELECTRIC R.O.W., Bid No. 95-30.

4. Bids shall be accompanied by a cashier's check or certified check upon a national or state bank in an amount not less than five percent (5%) of the total maximum bid price payable without recourse to the Town of Addison, or a bid bond in the same amount from a reliable surety company licensed by the State of Texas to act as a Surety, or a Binder of Insurance executed by a surety company licensed by the State of Texas to act as a surety or its authorized agent as a guarantee that the bidder will enter into a contract and execute a Performance Bond within ten (10) days after notice of award of contract to him.

5. Plans, specifications and bidding documents may be secured from Clyde Johnson, Purchasing Manager, Finance Building, 5350 Belt Line Road, Addison, Texas.

6. The right is reserved by the Mayor and the City Council as the interest of the City may require to reject any or all bids and to waive any informality in bids received.

7. The Bidder (Proposer) must supply all the information required by the Proposal Form.

8. A Performance Bond, Labor and Material Payment Bond, and Maintenance Bond will be required by the Owner; each Bond shall be in the amount of 100% of the total contract amount. Bonds shall be issued by a surety company licensed by the State of Texas to act as a Surety.

9. For information on bidding or to secure bid documents, call Clyde Johnson (214) 450-7090. For information on the work to be performed, call John Baumgartner, City Engineer, (214) 450-2886.

10. This project consists of providing paving, drainage, landscape, irrigation and other miscellaneous improvements as shown on the plans and in accordance with the specifications.

SECTION IB

INSTRUCTIONS TO BIDDERS

SECTION IB
INSTRUCTIONS TO BIDDERS

A. PROJECT: Midway Road Drainage Improvements, Greenhill Drive to T.U. Electric R.O.W. in the Town of Addison.

B. PROJECT DESCRIPTION: This project consists of providing paving, drainage, landscaping, irrigation and other miscellaneous improvements as shown on the plans and in accordance with the specifications.

C. PROPOSALS: Proposals must be in accordance with these instructions in order to receive consideration.

D. DOCUMENTS: Documents include the Bidding Requirements, General Provisions, Special Provisions, Technical Specifications, Drawings plus Addenda which may be issued by the Consultant during the bidding period. Bidding Documents may be viewed and/or obtained under the terms and conditions set forth in the Advertisement for Bids, Section AB of this Project Manual.

E. EXAMINATION OF DOCUMENTS AND SITE: Bidders shall carefully examine the Bidding Documents and the construction site to obtain first-hand knowledge of the scope and the conditions of the Work. Each Contractor, Subcontractor and Sub-subcontractor, by submitting a proposal to perform any portion of the Work, represents and warrants that he has examined the Drawings, Specifications (Project Manual) and the site of the Work, and from his own investigation has satisfied himself as to the scope, accessibility, nature and location of the Work; the character of the equipment and other facilities needed for the performance of the Work; the character and extent of other work to be performed; the local conditions; labor availability, practices and jurisdictions and other circumstances that may affect the performance of the Work. No additional compensation will be allowed by the Owner for the failure of such Contractor, Subcontractor or Sub-subcontractor to inform himself as to conditions affecting the Work.

F. INTERPRETATION OF DOCUMENTS: If any person contemplating submitting a bid for the proposed Contract is in doubt as to the meaning of any part of the Drawings, Specifications (Project Manual) or other proposed Contract Documents, he may submit to the Consultant, not later than seven (7) calendar days prior to the date set for opening bids, a written request for an interpretation or clarification. Bidders should act promptly and allow sufficient time for a reply to reach them before preparing their bids. Any interpretation or clarification will be in the form of an Addendum duly issued. No alleged verbal interpretation or ruling will be held binding upon the Owner.

G. SUBSTITUTIONS: Conditions governing the submission of substitutions for specific materials, products, equipment and processes are in the Special Provisions. Requests for substitutions must be received by the Consultant seven (7) calendar days prior to the established bid date.

H. ADDENDA: Interpretations, clarifications, additions, deletions and modifications to the Documents during the bidding period will be issued in the form of Addenda and a copy of such Addenda will be mailed or delivered to each person who has been issued a set of the Bidding Documents. Addenda will be a part of the Bidding Documents and the Contract Documents, and receipt of them shall be acknowledged in the Bid Form. All such interpretations and supplemental instructions will be in the form of written addenda to the contract documents which, if issued, will be sent by telegram, certified or registered mail, or hand delivered to all prospective bidders (at the respective addresses furnished for such purposes) not later than three (3) calendar days prior to the date fixed for the opening of bids. If any bidder fails to acknowledge the receipt of such addenda in the space provided in the bid form, his bid will nevertheless be construed as though the receipt of such addenda had been acknowledged.

I. COMPLETION TIME: A reasonable completion time has been established by the Owner and is indicated in the Proposal Form.

J. PREPARATION OF BIDS: Prices quoted shall include all items of cost, expense, taxes, fees and charges incurred, or arising out of, the performance of the work to be performed under the Contract. Bids shall be submitted in duplicate and shall be signed in ink. Any bid on other than the required form will be considered informal and may be rejected. Erasures or other changes in a bid must be explained or noted over the initials of the bidder. Bids containing any conditions, omissions, unexplained erasures and alterations, or irregularities of any kind may be rejected as informal. The prices should be expressed in words and figures or they may be deemed informal and may be rejected. In case of discrepancy between the prices written in the bid and those given in the figures, the price in writing will be considered as the bid. Failure to submit all requested information will make a bid irregular and subject to rejection. Bids shall be signed with name typed or printed below signature, and, if a partnership, give full name of all partners. Where bidder is a corporation, bids must be signed with the legal name of the corporation followed by the name of the state of incorporation and the legal signature of an officer authorized to bind the corporation to a contract.

K. SUBMITTAL OF BIDS: Sealed proposals will be received at the time, date and place stated in the Advertisement for Bids. Proposals shall be made on unaltered Proposal Forms furnished by the Consultant. Submit proposal in an opaque, sealed envelope addressed to the Owner and plainly mark on the outside of the envelope the project name, and the name and address of the bidder. The Bid Bond must be completed and signed by each bidder and submitted with the bid. Submit Bids by mail or in person prior to the time for receiving bids set forth in the Advertisement for Bids issued by the City.

L. MODIFICATION AND WITHDRAWAL OF BIDS: Prior to the time set for bid opening, bids may be withdrawn or modified. Bids may be modified only on the official bid form and must be signed by a person legally empowered to bind the bidder. No bidder shall modify, withdraw or cancel his bid or any part thereof for thirty (30) calendar days after the time agreed upon for the receipt of bids.

M. DISQUALIFICATION: The Owner reserves the right to disqualify proposals, before or after the opening, upon evidence of collusion with intent to defraud or other illegal practices relating to this proposal upon the part of the bidder.

N. SUBMISSION OF POST-BID INFORMATION: Upon notification of acceptance, the selected bidder shall, within five (5) calendar days, submit the following:

1. A designation of the portions of the Work proposed to be performed by the bidder with his own force.

2. A list of names of the subcontractors or other persons or organizations, including those who are to furnish materials and equipment fabricated to a special design proposed for such portions of the Work as may be designated in the Bidding Documents or as may be requested by the Consultant. The bidder will be required to establish to the satisfaction of the Owner and the Consultant the reliability and responsibility of the proposed Subcontractors and suppliers to furnish and perform the Work.

O. AWARD: The Owner reserves the right to accept any or to reject any bids without compensation to bidders and to waive irregularities and informalities.

The Consultant, in making his recommendation, will consider the following elements:

1. Whether the bidder is a contractor with experience in the type of work involved.

2. Whether the bidder has adequate plant, equipment and personnel to perform the work properly and expeditiously.

3. Whether the bidder has a suitable financial status and reputation for meeting obligations incident to work of the kind specified.

P. EXECUTION OF THE CONTRACT: The successful bidder will be required to enter into a contract with the Owner within ten (10) calendar days of notice by the Owner that his bid has been accepted. Failure to enter into contract within the established time limit without proper justification shall be considered grounds for forfeiture of the bid bond.

Q. CONSTRUCTION SCHEDULE: It is the Owner's desire to have the project completed and operational in as short a time as possible. The number of calendar days for completion of the project will begin with the date specified in the Notice to Proceed. The Notice to Proceed will be issued in a manner to facilitate a smooth construction of the project.

The Contractor shall substantially complete construction on this project within 145 calendar days from the proposed date of beginning. Substantial completion shall include all paving, drainage, utility, and pavement marking improvements. In no instance shall the number of calendar days for total completion of the contract work measured from the proposed date of beginning exceed 165 calendar days.

R. LIQUIDATED DAMAGES: The time of completion is the essence of this contract. For each calendar day that any work shall remain uncompleted after the time specified in the proposal and the contract, or the increased time granted by the Owner, or as equitably increased by additional work or materials ordered after the contract is signed, the sum per day given in the following schedule shall be deducted from the monies due the Contractor:

$ 500 per Calendar Day

The sum of money thus deducted for such delay, failure or non-completion is not to be considered as a penalty, but shall be deemed, taken and treated as reasonable liquidated damages, per calendar day that the Contractor shall be in default after the time stipulated in the contract for completing the work. The said amounts are fixed and agreed upon by and between Owner and Contractor because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner in such event would sustain; and said amounts are agreed to be the amounts of damages which the Owner would sustain and which shall be retained from the monies due, or that may become due, the Contractor under this contract; and if said monies be insufficient to cover the amount owing, then the Contractor or his surety shall immediately pay any additional amounts due. If the Contractor finds it impossible, for reasons beyond his control, to complete the work within the contract time as specified, the Contractor may make a written request for an extension of time in accordance with the General Provisions.

S. FORM OF CONTRACT: The contract for the construction of the project will be drawn up by the Owner. A sample form of agreement is included in the Contract Agreement Section.

T. BONDS: A Performance Bond, a Labor and Material Payment Bond and a Maintenance Bond will be required by the Owner. Sample forms have been included in the Performance Bond, Payment Bond and Maintenance Bond sections.

U. BID SECURITY: Bids shall be accompanied by a cashier's check or certified check upon a national or state bank in an amount not less than five percent (5%) of the total maximum bid price payable without recourse to the Town of Addison, or a bid bond in the same amount from a reliable surety company as a guarantee that the bidder will enter into a contract and execute Performance Bond within ten (10) calendar days after notice of award of contract to him. Such checks or bid bonds will be returned to all except the three lowest bidders within three (3) days after the opening of bids, and the remaining checks

or bid bonds will be returned promptly after the Owner has made an award of contract, or, if no award has been made within thirty (30) calendar days after the date of the opening of bids, upon demand of the bidder at any time thereafter, so long as he has not been notified of the acceptance of his bid.

V. RESOLUTIONS: If the bidder is a corporation, a copy of the resolution empowering the person submitting the bid to bind the bidder must be included with the bid.

W. CONSTRUCTION STAKING: Construction staking will not be provided by the Owner. Benchmarks and horizontal control are shown on the plans.

X. FINAL PAYMENT: The general provisions for Final Payment shall be as stated in Item 1.51.4 of the North Central Texas Standard Specifications for Public Works Construction (1983 Edition) including all Amendments and Additions. Prior to final payment the Contractor shall provide the Owner with the following items:

1. A Contractor's Affidavit of Bills Paid in accordance with Section BP.

2. A Consent of Surety Company to Final Payment.

3. A complete set of as-built plans which indicate all construction variations from the original construction documents in accordance with Item 5 of the Special Provisions.

4. A one (1) year Maintenance Bond in accordance with Section MB.

Y. ADJACENT PROPERTIES: The Contractor shall meet the requirements of the adjacent property owners as indicated on the plans.

Z. SOIL BORING INFORMATION: Appendix B contains soil boring logs which are provided solely for the Contractor's information. No additional payment will be made for any items of work should subsurface conditions vary throughout the construction area.

END OF SECTION IB

SECTION PF
PROPOSAL FORM

BID FORM

_____, 19__

TO: The Honorable Mayor and City Council
Town of Addison, Texas

Gentlemen:

The undersigned bidder, having examined the plans, specifications and contract documents, and the location of the proposed work, and being fully advised as to the extent and character of the work, proposes to furnish all equipment and to perform labor and work necessary for completion of the work described by and in accordance with the Plans, Specifications and Contract for the following prices, to wit:

Signed by: _____

ACKNOWLEDGEMENT OF ADDENDA:

The Bidder acknowledges receipt of the following addenda:

Addendum No. 1 _____

Addendum No. 2 _____

Addendum No. 3 _____

BID SCHEDULE A
TOWN OF ADDISON, TEXAS
ROADWAY IMPROVEMENTS
EASTBOUND BELT LINE ROAD RIGHT-TURN LANE
AT DALLAS NORTH TOLLWAY

Item No.	Est. Quan.	Unit	Description	Unit Price	Amount
1	1	L.S.	Mobilization, bonds and insurance, per lump sum	$_____	$_____
			_____ _____ _____	Dollars Cents	
2	0.7	AC.	Clearing and grubbing, complete in place, per acre	$_____	$_____
			_____ _____ _____	Dollars Cents	
3	1,850	L.F.	Sawed breakout groove, complete in place, per linear foot	$_____	$_____
			_____ _____ _____	Dollars Cents	
4.	1,850	S.Y.	Remove concrete pavement and curb, complete in place, per square yard	$_____	$_____
			_____ _____ _____	Dollars Cents	
5.	103	L.F.	Remove storm sewer (all sizes), complete in place, per linear foot	$_____	$_____
			_____ _____ _____	Dollars Cents	

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Item No.	Est. Quan.	Unit	Description	Unit Price	Amount
6.	230	L.F.	Remove 12' water line, complete in place, per linear foot	$_____	$_____
			_____ _____ _____	Dollars Cents	
7.	64	L.F.	Remove 8" sanitary sewer, complete in place, per linear foot	$_____	$_____
			_____ _____ _____	Dollars Cents	
8.	2,100	S.F.	Remove and replace brick pavers, complete in place, per square foot	$_____	$_____
			_____ _____ _____	Dollars Cents	
9.	1	L.S.	Remove and replace Greenhill School Sign, complete in place, per lump sum	$_____	$_____
			_____ _____ _____	Dollars Cents	
10.	2	EA.	Remove and replace Harvey Hotel sign, complete in place, per each	$_____	$_____
			_____ _____ _____	Dollars Cents	

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AT DALLAS NORTH TOLLWAY

Item No.	Est. Quan.	Unit	Description	Unit Price	Amount
11.	1	L.S.	Support or remove and replace brick wall, complete in place, per lump sum	$_____	$_____
			_____ _____ _____	Dollars Cents	
12.	1	L.S.	Remove and replace Marriott sign, complete in place, per lump sum	$_____	$_____
			_____ _____ _____	Dollars Cents	
13.	30	L.F.	Remove guard rail, complete in place, per linear foot	$_____	$_____
			_____ _____ _____	Dollars Cents	
14.	170	S.F.	Remove concrete flume, complete in place, per square foot	$_____	$_____
			_____ _____ _____	Dollars Cents	
15.	1,060	S.F.	Remove sidewalk, complete in place, per square foot	$_____	$_____
			_____ _____ _____	Dollars Cents	

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Item No.	Est. Quan.	Unit	Description	Unit Price	Amount
16.	10	EA.	Plug storm sewers (all sizes), complete in place, per each	$_____	$_____
			_____	Dollars	
			_____	Cents	
			_____		
17.	1	L.S.	Construction barricading, signing, traffic control, complete in place, per lump sum	$_____	$_____
			_____	Dollars	
			_____	Cents	
			_____		
18.	1,050	S.Y.	6" - 3,600 psi reinforced concrete pavement, complete in place, per square yard	$_____	$_____
			_____	Dollars	
			_____	Cents	
			_____		
19.	400	S.Y.	6" - 3,000 psi (48 hrs) Early Strength reinforced concrete pavement, complete in place, per square yard	$_____	$_____
			_____	Dollars	
			_____	Cents	
			_____		
20.	420	S.Y.	8" - 3,000 psi (48 hrs) Early Strength reinforced concrete pavement, complete in place, per square yard	$_____	$_____
			_____	Dollars	
			_____	Cents	
			_____		

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AT DALLAS NORTH TOLLWAY

Item No.	Est. Quan.	Unit	Description	Unit Price	Amount
21.	1,180	L.F.	6" - 3,600 psi Integral concrete curb, complete in place, per linear foot	$_____	$_____
			_____	Dollars	
			_____	Cents	
			_____		
22.	810	S.F.	4' - 2,500 psi Reinforced concrete sidewalk, complete in place, per square foot	$_____	$_____
			_____	Dollars	
			_____	Cents	
			_____		
23.	1	EA.	5' Standard curb inlet, complete in place, per each	$_____	$_____
			_____	Dollars	
			_____	Cents	
			_____		
24.	3	EA.	10' Standard curb inlet, complete in place, per each	$_____	$_____
			_____	Dollars	
			_____	Cents	
			_____		
25.	1	EA.	14' Standard curb inlet, complete in place, per each	$_____	$_____
			_____	Dollars	
			_____	Cents	
			_____		

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Item No.	Est. Quan.	Unit	Description	Unit Price	Amount
26.	2	EA.	10' Recessed curb inlet, complete in place, per each	$_____	$_____
			_____ Dollars _____ Cents		
27.	6	EA.	2-10' Recessed curb inlet, complete in place, per each	$_____	$_____
			_____ Dollars _____ Cents		
28.	1	EA.	4' Standard "Y" inlet, complete in place, per each	$_____	$_____
			_____ Dollars _____ Cents		
29.	12	L.F.	21" RCP Class III, complete in place, per linear foot	$_____	$_____
			_____ Dollars _____ Cents		
30.	166	L.F.	24" RCP Class III, complete in place, per linear foot	$_____	$_____
			_____ Dollars _____ Cents		

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Item No.	Est. Quan.	Unit	Description	Unit Price	Amount
31.	220	L.F.	27" RCP Class III, complete in place, per linear foot	$_____	$_____
			_____ _____ _____	Dollars Cents	
32.	15	L.F.	36" RCP Class III, complete in place, per linear foot	$_____	$_____
			_____ _____ _____	Dollars Cents	
33.	35	L.F.	39" RCP Class III, complete in place, per linear foot	$_____	$_____
			_____ _____ _____	Dollars Cents	
34.	1	EA.	45° - 24" RCP bend, complete in place, per each	$_____	$_____
			_____ _____ _____	Dollars Cents	
35.	2	EA.	45° - 36" RCP bend, complete in place, per each	$_____	$_____
			_____ _____ _____	Dollars Cents	

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Item No.	Est. Quan.	Unit	Description	Unit Price	Amount
36.	1	EA.	45° - 39" RCP bend, complete in place, per each	$_____	$_____
			_____ _____ _____	Dollars Cents	
37.	398	L.F.	8' x 4' Precast RCB (ASTM C-789), complete in place, per linear foot	$_____	$_____
			_____ _____ _____	Dollars Cents	
38.	16	L.F.	8' x 4' Precast RCB (ASTM C-850), complete in place, per linear foot	$_____	$_____
			_____ _____ _____	Dollars Cents	
39.	895	L.F.	9' x 5' Precast RCB (ASTM C-789), complete in place, per linear foot	$_____	$_____
			_____ _____ _____	Dollars Cents	
40.	30	L.F.	9' x 5' Precast RCB (ASTM C-850), complete in place, per linear foot	$_____	$_____
			_____ _____ _____	Dollars Cents	

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Item No.	Est. Quan.	Unit	Description	Unit Price	Amount
41.	10	L.F.	8' x 4' to 9' x 5' RCB transition, complete in place, per linear foot	$_____ Dollars _____ Cents	$_____
42.	245	L.F.	12" - SDR 14 PVC Water line, complete in place, per linear foot	$_____ Dollars _____ Cents	$_____
43.	2	EA.	12" Valve, complete in place, per each	$_____ Dollars _____ Cents	$_____
44.	1	EA.	Cut in 12" valve, complete in place, per each	$_____ Dollars _____ Cents	$_____
45.	1	EA.	Cut and plug 6" water line, complete in place, per each	$_____ Dollars _____ Cents	$_____

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Item No.	Est. Quan.	Unit	Description	Unit Price	Amount
46.	1	EA.	8" x 6" Tapping sleeve and valve, complete in place, per each	$_____ Dollars _____ Cents	$_____
47.	1	EA.	6" Fire hydrant lead, complete in place, per each	$_____ Dollars _____ Cents	$_____
48.	1	EA.	Relocate fire hydrant, complete in place, per each	$_____ Dollars _____ Cents	$_____
49.	69	L.F.	10" - SDR 35 PVC Sewer Line, complete in place, per linear foot	$_____ Dollars _____ Cents	$_____
50.	1	EA.	Sanitary sewer manhole, complete in place, per each	$_____ Dollars _____ Cents	$_____

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Item No.	Est. Quan.	Unit	Description	Unit Price	Amount
51.	1	EA.	Sanitary sewer manhole over existing sewer, complete in place, per each	$_____	$_____
			_____ Dollars _____ Cents		
52.	3	C.Y.	2,500 psi concrete encasement, complete in place, per cubic yard	$_____	$_____
			_____ Dollars _____ Cents		
53.	2	EA.	Adjust telephone conduit, complete in place, per each	$_____	$_____
			_____ Dollars _____ Cents		
54.	300	L.F.	Temporary safety fence, complete in place, per linear foot	$_____	$_____
			_____ Dollars _____ Cents		
55.	2	EA.	Temporary Harvey Hotel signs, complete in place, per each	$_____	$_____
			_____ Dollars _____ Cents		

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Item No.	Est. Quan.	Unit	Description	Unit Price	Amount
56.	1	EA.	Temporary Marriott sign, complete in place, per each	$_____	$_____
			_____ _____ _____	Dollars Cents	
57.	1	L.S.	Traffic signalization, (temporary and permanent), complete in place, per lump sum	$_____	$_____
			_____ _____ _____	Dollars Cents	
58.	1	L.S.	Remove, relocate, or replace irrigation system, complete in place, per lump sum	$_____	$_____
			_____ _____ _____	Dollars Cents	
59.	1	EA.	Install multi-trunked (10') Female Yaupon, complete in place, per each	$_____	$_____
			_____ _____ _____	Dollars Cents	
60.	3	EA.	Install multi-trunked (10') Crape Myrtle, complete in place, per each	$_____	$_____
			_____ _____ _____	Dollars Cents	

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Item No.	Est. Quan.	Unit	Description	Unit Price	Amount
61.	1	EA.	Install 10" Dia. Cedar Elm, complete in place, per each	$_____	$_____
			_____ _____ _____	Dollars Cents	
62.	2	EA.	Install 7" Dia. Red Oak, complete in place, per each	$_____	$_____
			_____ _____ _____	Dollars Cents	
63.	1	EA.	Install 8" Dia. Red Oak, complete in place, per each	$_____	$_____
			_____ _____ _____	Dollars Cents	
64.	3	EA.	Install 11" Dia. Live Oak, complete in place, per each	$_____	$_____
			_____ _____ _____	Dollars Cents	
65.	1	EA.	Install 12" Dia. Live Oak, complete in place, per each	$_____	$_____
			_____ _____ _____	Dollars Cents	

BID SCHEDULE A
TOWN OF ADDISON, TEXAS
ROADWAY IMPROVEMENTS
EASTBOUND BELT LINE ROAD RIGHT-TURN LANE
AT DALLAS NORTH TOLLWAY

Item No.	Est. Quan.	Unit	Description	Unit Price	Amount
66.	32	EA.	Install Dwarf Burford Holly, complete in place, per each	$_____ Dollars _____ Cents	$_____
67.	1,000	EA.	Install Asiatic Jasmine, complete in place, per each	$_____ Dollars _____ Cents	$_____
68.	500	EA.	Install Annual Cover (4"), complete in place, per each	$_____ Dollars _____ Cents	$_____
69.	7	EA.	Install Gulf Stream Nandina, complete in place, per each	$_____ Dollars _____ Cents	$_____
70.	5	EA.	Install Juniper ground cover, complete in place, per each	$_____ Dollars _____ Cents	$_____

BID SCHEDULE A
TOWN OF ADDISON, TEXAS
ROADWAY IMPROVEMENTS
EASTBOUND BELT LINE ROAD RIGHT-TURN LANE
AT DALLAS NORTH TOLLWAY

Item No.	Est. Quan.	Unit	Description	Unit Price	Amount
71.	4	EA.	Install Holly bushes at Greenhill School, complete in place, per each	$_____	$_____
			_____ _____ _____	Dollars Cents	
72.	2,000	S.F.	Block sod (Bermuda or St. Augustine), complete in place, per square foot	$_____	$_____
			_____ _____ _____	Dollars Cents	
73.	3,150	S.F.	Bermuda Hydromulch, complete in place, per square foot	$_____	$_____
			_____ _____ _____	Dollars Cents	
74.	1	L.S.	Remove and replace Marriott entrance landscaping, complete in place, per lump sum	$_____	$_____
			_____ _____ _____	Dollars Cents	
75.	820	L.F.	4" White paint stripe, complete in place, per linear foot	$_____	$_____
			_____ _____ _____	Dollars Cents	

BID SCHEDULE A
TOWN OF ADDISON, TEXAS
ROADWAY IMPROVEMENTS
EASTBOUND BELT LINE ROAD RIGHT-TURN LANE
AT DALLAS NORTH TOLLWAY

Item No.	Est. Quan.	Unit	Description	Unit Price	Amount
76.	710	L.F.	Red fire lane striping, complete in place, per linear foot	$_____	$_____
			_____ _____ _____	Dollars Cents	
77.	1	EA.	Directional pavement, complete in place, per each	$_____	$_____
			_____ _____ _____	Dollars Cents	
78.	20	EA.	4" type P-7W White non-reflective lane line buttons, complete in place, per each	$_____	$_____
			_____ _____ _____	Dollars Cents	
79.	30	EA.	4" Type P-15W White reflective lane line buttons, complete in place, per each	$_____	$_____
			_____ _____ _____	Dollars Cents	
80.	20	EA.	4" Type P117Y Yellow double reflective center line buttons, complete in place, per each	$_____	$_____
			_____ _____ _____	Dollars Cents	

BID SCHEDULE A
TOWN OF ADDISON, TEXAS
ROADWAY IMPROVEMENTS
EASTBOUND BELT LINE ROAD RIGHT-TURN LANE
AT DALLAS NORTH TOLLWAY

Item No.	Est. Quan.	Unit	Description	Unit Price	Amount
81.	3	EA.	Remove and replace permanent traffic signs, complete in place, per each	$_____	$_____
			_____ Dollars _____ Cents		
82.	1	EA.	White painted "STOP" marking, complete in place, per each	$_____	$_____
			_____ Dollars _____ Cents		
83.	1	EA.	12" white painted stop bar, complete in place, per each	$_____	$_____
			_____ Dollars _____ Cents		
84.	1	EA.	24" White thermoplastic stop bar, complete in place, per each	$_____	$_____
			_____ Dollars _____ Cents		
			TOTAL AMOUNT BID FOR BID SCHEDULE A, ITEMS 1 THROUGH 84, INCLUSIVE		$_____
			_____ Dollars _____ Cents		

The substantial completion time for this Contract is 145 calendar days. The total completion time for this Contract is 165 calendar days.

NOTES:

1. All items, labor, materials, equipment, facilities, incidentals and work required for construction of the project are to be provided and installed by the Contractor as part of the project and payment for the cost of such shall be included in the price bid for the construction of the project.

2. Prices must be shown in words and figures for each item listed in this proposal. In the event of discrepancy, the words shall control.

3. Materials, which are "tax exempt," are those items which are physically incorporated into the facilities constructed for the OWNER, as set forth in the Special Provisions. Materials include, but are not limited to purchased items such as concrete, and roadbase, etc.

   Services, which are "not tax exempt," are those items which are used by the Contractor but are not physically incorporated into the OWNER's facility and/or items which are consumed by construction, as set forth in the Special Provisions. Services include, but are not limited to, items such as supplies, tools, skill and labor, the purchase, rental or lease of equipment, etc.

If BIDDER is:

An Individual

By _____ (Seal)
(Individual's Name)

doing business as _____

Business address: _____

_____

_____

Phone No. _____

A Partnership

By _____ (Seal)
(Firm Name)

_____
(General Partner)

doing business as _____

Business address: _____

_____

_____

Phone No. _____

A Corporation

By _____
(Corporation Name)

_____
(State of Incorporation)

By _____
(Name of Person Authorized to Sign)

_____
(Title)

(Corporate Seal)

Attest _____
(Secretary)

Business address: _____

_____

_____

Phone No. _____

A Joint Venture

By _____
(Name)

_____
(Address)

By _____
(Name)

_____
(Address)

(Each joint venturer must sign. The manner of signing for each individual, partnership and corporation that is a party to the joint venture should be in the manner indicated above.)

SECTION CA
CONTRACT AGREEMENT

SECTION CA
AGREEMENT

STATE OF TEXAS

COUNTY OF DALLAS

THIS AGREEMENT is made and entered into this ____ day of _____, 19___, by and between the Town of Addison, of the County of Dallas and State of Texas, acting through its Mayor, thereunto duly authorized so to do, Party of the First Part, hereinafter termed the OWNER, and _____, of the City of _____, County of _____, State of _____, Party of the Second Part, hereinafter termed CONTRACTOR.

WITNESSETH: That for and in consideration of the payment and agreement hereinafter mentioned, to be made and performed by the OWNER, the said CONTRACTOR hereby agrees with the said OWNER to commence and complete construction of certain improvements as follows:

Midway Road Drainage Improvements,
From Greenhill Drive to T.U. Electric R.O.W.

and all extra work in connection therewith, under the terms as stated in the General and Specific Provisions of the AGREEMENT; and at his own proper cost and expense to furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance and other accessories and services necessary to complete the said construction, in accordance with the conditions and prices stated in the Proposal attached hereto and in accordance with the Advertisement for Bids, Instructions to Bidders, General Provisions, Special Provisions, Plans, and other drawings and printed or written explanatory matter thereof, and the Technical Specifications and Addenda thereto, as prepared by the OWNER, each of which has been identified by the endorsement of the CONTRACTOR and the OWNER thereon, together with the CONTRACTOR's written Proposal and the General Provisions, all of which are made a part hereof and collectively evidence and constitute the entire AGREEMENT.

The CONTRACTOR hereby agrees to commence work within five (5) calendar days after the date of written notice to do so shall have been given to him, to substantially complete the work within 145 calendar days after he commences work, and to totally complete the work in 165 calendar days after he commences work, subject to such extensions of time as are provided by the General Provisions.

The OWNER agrees to pay the CONTRACTOR $_____ in current funds for the performance of the Contract in accordance with the Proposal submitted thereof, subject to additions and deductions, as provided in the General Provisions, and to make payments of account thereof as provided therein.

IN WITNESS WHEREOF, the parties of these presents have executed this AGREEMENT in the year and day first above written.

TOWN OF ADDISON
(OWNER)

ATTEST:

By: _____

_____
City Secretary

_____
Party of the Second Part
(CONTRACTOR)

ATTEST:

_____

By: _____

The following to be executed if the CONTRACTOR is a corporation:

I, _____, certify that I am the secretary of the corporation named as CONTRACTOR herein; that _____, who signed this Contract on behalf of the CONTRACTOR is the _____ of said corporation; that said

(official title)

Contract was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

Signed: _____

Corporate Seal

SECTION PrB

PERFORMANCE BOND

SECTION PrB
PERFORMANCE BOND

STATE OF TEXAS

COUNTY OF DALLAS Date Bond Executed: _____

PRINCIPAL: _____

_____

SURETY: _____

_____

PENAL SUM OF BOND (express in words and figures): _____

_____

DATE OF CONTRACT: _____

_____

KNOW ALL MEN BY THESE PRESENTS, that we, the PRINCIPAL and SURETY above named, are held firmly bound unto the Town of Addison, Texas, hereinafter called the OWNER, in the penal sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH that, whereas the PRINCIPAL entered into a certain Contract with the OWNER, numbered and dated as shown above and attached hereto;

NOW THEREFORE, if the PRINCIPAL shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of said Contract during the original term of said Contract and any extension thereof that may be granted by the OWNER, with or without notice to the SURETY, and during the life of any guaranty required under the Contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of said Contract that may hereafter be made, notice of which modifications of said SURETY being hereby waived, then this obligation to be void, otherwise in full force and virtue.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

SEAL

_____
CONTRACTOR

By: _____

WITNESS _____

Address: _____

SEAL

_____
SURETY

ATTEST:

_____

By: _____

_____

_____

Address: _____

_____

Title: _____

(Surety to Attach Power of Attorney)

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the secretary of the corporation named as PRINCIPAL in the within bond that _____, who signed the said bond on behalf of the PRINCIPAL, is the _____ of said corporation; that I know his signature, and his signature thereto is genuine; and that said bond was duly signed, sealed and attested for and in behalf of said corporation by authority of its governing body.

_____
(Corporate Seal)

SECTION MB
MAINTENANCE BOND

SECTION MB
MAINTENANCE BOND

STATE OF TEXAS

COUNTY OF DALLAS

That _____ as principal and _____

_____, a corporation organized under the laws of _____

and _____ as sureties, said sureties being authorized to do business in the State of Texas, do hereby expressly acknowledge themselves to be held and bound to pay unto the Town of Addison, a municipal corporation, chartered by virtue of a Special Act of Legislature of the State of Texas, as Addison, Dallas County, Texas, the sum of

_____

_____

_____

($_____) for the payment of which sum will and truly to be made unto said Town of Addison and its successors, said principal and sureties do hereby bind themselves, their assigns and successors, jointly and severally.

This obligation is conditioned, however, that whereas said

_____

has this day entered into a written contract with the said Town of Addison to build and construct the

_____

_____

_____

_____

which contract and the Plans and Specifications therein mentioned adopted by the Town of Addison, are hereby expressly made a part hereof as though the same were written and embodied herein.

WHEREAS, under the Plans, Specifications and Contract it is provided that the Contractor will maintain and keep in good repair the work herein contracted to be done and performed for a period of one (1) year from the date of acceptance, and to do all necessary backfilling that may arise on account of sunken conditions in ditches, or otherwise, and to do and perform all necessary work and repair any defective condition growing out of or arising from the improper joining of the same, or on account of any breaking of the same caused by the said Contractor in laying or building the same, or on account of any defect arising in any of said part of said work laid or constructed by the said Contractor, or on account of improper excavation or backfilling; it being understood that the purpose of this section is to cover all defective conditions arising by reason of defective materials, work or labor performed by the said Contractor; and in case the said Contractor shall fail to do, it is agreed that the City may do said work and supply such materials, and charge the same against the said Contractor and sureties on this obligation, and the said Contractor and sureties hereon shall be subject to the liquidated damages mentioned in said contract for each day's failure on its part to comply with the terms of the said provisions of said contract;

NOW THEREFORE, if the said Contractor shall keep and perform its said agreement to maintain said work and keep the same in repair for the said maintenance period of one (1) year, as provided, then these presents shall be null and void and have no further effect; but if default shall be made by the said Contractor in the performance of its contract to so maintain and repair said work, then these presents shall have full force and effect, and said Town of Addison shall have and recover from the Contractor and its sureties damages in the premises, as provided, and it is further understood and agreed that this obligation shall be a continuing one against the principal and sureties hereon and that successive recoveries may be had hereon for successive branches until the full amount shall have been exhausted; and it is further understood that the obligation herein to maintain said work shall continue throughout said maintenance period, and the same shall not be changed, diminished, or in any manner affected from any cause during said time.

IN WITNESS WHEREOF, the said _____ has caused these presents to be executed by _____ and the said _____ has hereunto set his hand this the ____ day of _____, 19___.

SURETY

_____

_____

By: _____
Attorney in Fact

By: _____
Surety

_____

_____
Agency and Address

PRINCIPAL

_____

By: _____

ATTEST

_____
Secretary

NOTE: Date of Maintenance Bond must not be prior to date of Contract.

SECTION GP

GENERAL PROVISIONS

GENERAL PROVISIONS

1. The General Provisions of the Contract shall be as stated in the Standard Specifications for Public Works Construction, North Central Texas Council of Governments (1983), under Part I, "General Provisions," Items 1.0 through 1.63 inclusive, as amended or supplemented and except as modified by the Special Provisions.

SECTION SP

SPECIAL PROVISIONS

SECTION SP
SPECIAL PROVISIONS

1. OWNER

The Town of Addison, herein referred to as Owner, party of the First Part of these Contract Documents.

2. ENGINEER

Espey, Huston & Associates, Inc., Engineer of the Owner, or other representative as may be authorized by said Owner to act in any particular position.

3. FORMS, PLANS AND SPECIFICATIONS

Forms of Proposal, Contract, Bonds and Plans may be obtained from the office of Mr. Clyde Johnson, Purchasing Agent, Finance Building, 5350 Beltline Road, Addison, Texas.

4. COPIES OF PLANS FURNISHED

Three (3) sets of Plans shall be furnished to the Contractor, at no charge, for construction purposes. Additional copies may be obtained at cost of reproduction upon request.

5. PRODUCT RECORD DOCUMENTS

Maintenance of Documents. The Contractor shall maintain at the job site one record copy of the Contract Drawings, Specifications, Shop Drawings, Change Orders, other modification to the Contract, field test records and other documents submitted by Contractor in compliance with specification requirements. These documents shall be maintained at the job site apart from documents used for construction. These documents are not be used for construction purposes. The documents shall be maintained in clean, legible condition. The documents shall be made available at all times for inspection by the Owner.

Recording. Each document shall be labeled Project Record Copy in 2-inch high printed letters. The record documents shall be kept current. No work shall be covered until required information has been recorded.

Contract Drawings. The appropriate drawing shall be legibly marked to record, where applicable:

Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.

Field changes of dimension and detail made during construction process.

Changes made by Change Order or Supplemental Agreement.

Details not on original Contract Drawings.

Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.

Changes made by Change Order or Supplemental Agreement.

Other matters not originally specified.

Shop Drawings. The Contractor shall maintain the Shop Drawings as record drawings and legibly annotate shop drawings to record changes made after review. A red felt-tip marking pen shall be used for all recording.

Submittal. At the completion of the project, the Contractor shall deliver record drawings to the Owner. The transmittal letter shall be accompanied, in duplicate, with:

Date, project title and number.

Contractor's name and address.

Title and number of each record document.

Certification that each document as submitted is complete and accurate.

Signature of Contractor or his authorized representative.

6. HORIZONTAL AND VERTICAL SURVEY CONTROL

The Contractor shall provide horizontal and vertical survey control for this project.

7. PERMITS, LICENSES, AND REGULATIONS

Permits and licenses of a temporary nature necessary for the prosecution of the Work shall be secured and paid for by the Contractor. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the Owner, unless otherwise specified. If the Contractor observes that the Drawings and Specifications are at variance therewith, he shall promptly notify the Engineer in writing, and any necessary changes shall be adjusted as provided in the Contract for changes in Work. The Contractor shall comply with all federal, state and local laws, rules and regulations of every kind and nature applicable to the performance of its Work hereunder, and shall hold the Owner harmless therefrom.

8. REFERENCE SPECIFICATIONS

Where reference is made to specifications compiled by others, such are hereby made a part of these Specifications.

9. REVIEW OF WORK

The Owner shall have the right to review the Work while such Work is in progress to ascertain that the Work is being accomplished in compliance with the standards and requirements set forth in the Contract Documents. It is also contemplated that similar review will be conducted by governmental inspectors. Notwithstanding such review, the Contractor will be held responsible for the finished Work, and any acceptance of the Work by the Owner or governmental agencies will not relieve the Contractor from responsibility for the Work. The Owner reserves the right to place full-time construction observers at the site of the Work.

The Owner and his representatives shall at all times have access to the Work whenever it is in preparation or progress, and the Contractor shall provide proper facilities for such access, and for review.

If the Specifications, the Owner's instructions, laws, ordinances, or any public authority require any Work to be specially tested, the Contractor shall give the Owner timely notice of its readiness for testing, and if the testing is by an authority other than the Owner, of the date fixed for such testing. Tests by the Owner shall be made promptly, and where practicable at the source of supply.

Re-examination of any Work may be ordered by the Owner, and, if so ordered, the Work must be uncovered by the Contractor. If such Work is found to be in accordance with the Contract Documents, the Owner shall pay the cost of re-examination and replacement. If such Work is not in accordance with the Contract Documents, the Contractor shall pay such cost.

10. SCOPE OF WORK

The Work for this Project consists of furnishing all materials, labor, equipment, tools and incidentals necessary to construct, in accordance with the Plans and Specifications, the proposed Midway Road Drainage Improvements, from Greenhill Drive to T.U. Electric R.O.W.

11. PROPERTY LINES AND MONUMENTS

All property corners, control monumentations, construction and survey stakes and marks shall be carefully preserved by the Contractor, and in case of careless destruction or removal by Contractor or his employees, such stakes or marks shall be replaced at the Contractor's expense as required by the Owner.

12. DISCREPANCIES

If the Contractor, in the course of the Work, finds any discrepancy between the Contract Documents and the physical conditions of the locality, or any errors or omissions in drawings or in the layout as given by survey points and instructions, or if it appears that any Plan, Specification or other Contract Document is or may be not in compliance with any building code or other requirement of any governmental body, he shall immediately inform the Owner in writing, and the Owner shall promptly verify the same. Any Work done after such discovery, until authorized, will be done at the Contractor's risk.

13. TIME ALLOTTED FOR COMPLETION

All items of Work included under these contracts shall be completed within the time stipulated in the Proposal. The time shall commence on the date specified in the Notice to Proceed. The Notice to Proceed shall consist of a written request by the Owner for the Contractor to proceed with construction of the Project.

14. EXISTING STRUCTURES

The Plans show the location of all known surface and subsurface structures. However, the Owner assumes no responsibility for failure to show any or all of these structures on the Plans, or to show them in their exact location. It is mutually agreed that such failure shall not be considered sufficient basis for claims for additional compensation or extra work or for increasing the pay quantities in any manner whatsoever, unless the obstruction encountered is such as to necessitate changes in the lines or grades, or require the building of special work, provisions for which are not made in the Plans and Proposal, in which case the provisions in these Specifications for extra work shall apply.

15. EXISTING UTILITIES AND SERVICE LINES

The Contractor shall contact all the utility companies which have facilities in the vicinity of the proposed improvements to confirm the horizontal and vertical locations of their respective facilities prior to commencing work. Where a conflict with the proposed improvements is encountered, the Contractor shall notify the Engineer immediately prior to proceeding with the work.

The Contractor shall be responsible for the protection of all existing utilities or service lines crossed or exposed by his construction operation. Where existing utilities or service lines are cut, broken or damaged, the Contractor shall replace the utilities or service lines with the same type of original construction, or better, at his own cost and expense. All replacement, backfill and compaction shall be accomplished in strict accordance with the requirements of the owner of the utility or service line.

16. PUBLIC UTILITIES AND OTHER PROPERTY TO BE CHANGED

In case it is necessary to change or move the property of any owner or of a public utility, such property shall not be moved or interfered with until authorized by the utility company and approved by the Owner. The right is reserved to the owner of public utilities to enter upon the limits of the Project for the purpose of making such changes or repairs of this contract.

17. LIGHTS AND POWER

The Contractor shall provide, at his own expense, temporary lighting and power facilities required for the proper execution of the Work.

18. PERMITS AND RIGHTS-OF-WAY

The Owner will provide rights-of-way for the purpose of construction without cost to the Contractor by securing permits in areas of public dedication or by obtaining easements across privately-owned property. It shall be the responsibility of the Contractor, prior to the initiation of construction on easements through private property, to inform the property owner of his intent to begin construction. Before beginning construction in areas of public dedication, the Contractor shall inform the agency having jurisdiction in the area forty-eight (48) hours prior to initiation of the Work. The Contractor shall obtain a right-of-way permit from the Town of Addison.

19. PRECONSTRUCTION CONFERENCE

The successful Contractor(s) and Owner shall meet at the call of the Owner on this Project. Prior to the meeting, the Contractor(s) shall prepare schedules showing the sequencing and progress of their work and its effect on others. These schedules shall be delivered to the Owner in advance of the meeting for his review. The general nature of the work, materials used, and methods of construction as well as the schedules will be discussed at the meeting. A final composite schedule will be prepared during this conference to allow an orderly sequence of project construction.

20. ADDENDA

Bidders desiring further information, or interpretation of the Plans and Specifications, must make written request for such information to the Engineer (prior to forty-eight (48) hours before the Bid opening). Answers to all such requests will be given in writing to all Bidders in addendum form and all addenda will be bound with and made a part of the Contract Documents. No other explanation or interpretation will be considered official or binding. Should a Bidder find discrepancies in, or omissions from, the Plans, Specifications or Contract Documents, or should he be in doubt as to their meaning, he shall at once notify the Engineer in writing in order that a written addendum may be sent to all Bidders.

21. WATER FOR CONSTRUCTION

The Contractor shall make the necessary arrangements with the Town of Addison for securing and transporting all water required in the construction, including water required for mixing of concrete, sprinkling, testing or flushing. Water required for construction shall be paid for by the Contractor at the Town of Addison prevailing rates. There will be no separate pay item for connection into the existing water system and quantity of water required for construction purposes.

22. EXCAVATION

The Contractor shall exercise precautions to insure that drainage from adjacent properties is not blocked by his excavations.

23. CONTRACTOR's BID

The Contractor's Bid shall be on a Unit Price basis for construction of the Project as shown on the Plans and described in the Specifications.

24. OWNER'S STATUS

The Owner shall perform technical review of the Work. He shall also have authority to reject all Work and materials which do not conform to the Contract and to decide questions which arise in the execution of the Work.

25. OWNER'S DECISIONS

The Owner shall, within a reasonable time after their presentation to him, make decisions in writing on all claims of the Contractor and on all other matters relating to the execution and progress of the Work or the interpretation of the Contract Documents.

26. LANDS FOR WORK

The Owner shall provide as indicated on the Plans for this Project, the lands upon which the Work under this Contract is to be done, right-of-way for access to same, and such other lands which are designated on the Plans or in the Specifications for the use of the Contractor. Such lands and rights-of-way shall be adequate for the performance of the Contract. Should the Contractor be delayed as the result of lack of access, this shall be cause for an extension of time but not for additional cost.

The Contractor shall provide at his own expense and without liability to the Owner any additional land and access thereto that may be required for temporary construction facilities.

27. CLEANING UP

The Contractor shall remove at his own expense all temporary structures, rubbish and waste materials resulting from his operations. These requirements shall not apply to property used for permanent disposal of rubbish or waste materials in accordance with permission of such disposal granted to the Contractor by the Owner thereof.

28. LIQUIDATED DAMAGES FOR DELAY BY CONTRACTOR

The time of completion is of the essence in this contract. For each calendar day that any Work shall remain uncompleted after the time specified in paragraph 38, liquidated damages shall be deducted from the monies due the Contractor in the amount of $500 per day.

29. USE OF EXPLOSIVES

Use of explosives will not be allowed.

30. PROJECT MAINTENANCE

The Contractor shall maintain, and keep in good repair, the improvements covered by these Plans and Specifications during the life of his contract.

31. DISPOSAL OF WASTE AND SURPLUS EXCAVATION

All asphalt, concrete, rock or excavated material, or other debris removed from the site as a preliminary to the construction shall be removed from the property. Any required disposal permits shall be the sole responsibility of the Contractor.

32. REMOVALS, ADJUSTMENTS AND REPLACEMENTS

Existing pavements, driveways, curbs, gutters, sidewalks, etc., to be removed to facilitate the construction of the improvements shall be broken up and disposed of. Care shall be exercised to leave a neat, uniform edge or joint at the excavation limits or sections removed where only portions are to be removed. The Owner will designate the limits to be removed. Where pavements, driveways, curbs, gutters, sidewalks, etc., shall be replaced, then said replacements shall be to the standard of the previously removed portion or better.

Existing structures such as manholes, inlets, cleanouts, valve boxes, etc. which are not the property of a private firm or company, or an individual required to move their own property, shall be adjusted, altered or reset to the requirement elevation and alignment. New materials and workmanship necessary shall conform to the requirements of these Specifications covering the particular Work. Salvaged materials in good condition may be used in rebuilding such structures, provided the materials are thoroughly cleaned before their use.

All private obstruction which are indicated on the Plans to be moved, will be removed and replaced, or moved to new permanent locations by the Contractor, without additional payment to the Contractor. Any such additional item which the Contractor moves or causes to be moved for his own convenience shall be at his own expense.

33. TOWN OF ADDISON APPROVAL

This project is subject to final approval and acceptance by Town of Addison.

34. TRAFFIC CONTROL

The Contractor shall be responsible for providing traffic control during the construction of this Project consistent with the provisions set forth in the "1980 Texas Manual on Uniform Traffic Control Devices for Streets and Highways" issued under the authority of the "State of Texas Uniform Act Regulating Traffic on Highways", codified as Article 6701d Vernon's Civil Statutes, pertinent sections being Section Nos. 27, 29, 30 and 31. The Contractor will not remove any regulatory sign, instructional sign, street name sign, or other sign which has been erected by the City. If it is determined that a sign must be removed to permit required construction, the Contractor shall contact the Town of Addison to remove the sign. In the case of regulatory signs, the Contractor must replace the permanent sign with a temporary sign meeting the requirements of the above-referenced manual, and such a temporary sign must be installed prior to the removal of the existing sign.

35. CERTIFICATION

The Contractor shall submit a manufacturer's certification that the material was manufactured and tested in accordance with the referenced Specifications and a report of test results. The certification shall be submitted prior to material shipment.

36. FINAL ACCEPTANCE OF WORK

Final acceptance of the Work is subject to final testing and approval of the Work by the Town of Addison.

37. WORK AREA

Contractor shall restrict his construction activity to the project site.

38. CONTRACT TIME

It is the Owner's desire to have the project completed and operational in as short a time as possible. The number of calendar days for substantial completion and total completion of the project will begin with the date specified in the Notice to Proceed. In no instance shall the number of calendar days for the substantial completion of the Work measured from the proposed date of beginning exceed 145 calendar days. In no instance shall the number of calendar days

for the total completion of the Work measured from the proposed date of beginning exceed 165 calendar days.

39. CONTRACTOR'S AFFIDAVIT OF BILLS PAID

The Contractor shall be required to execute the form provided in Section BP prior to the acceptance of the project.

40. PAY ITEMS

Pay items provided are intended to be all-inclusive of the work required on this project. Work required by the plans or specifications but not provided with a specific pay item shall be considered incidental to other items of work.

41. SAMPLES AND TESTS OF MATERIALS

Modify the General Provisions, Section GP 5.16, Samples and Tests of Materials.

> "The Contractor shall designate and pay a recognized testing laboratory to perform all testing and concrete design for this project. Such designation shall be subject to the approval of the Engineer. All testing services that the Contractor is required to provide will not be paid for separately, but shall be considered subsidiary to other items of work.
>
> "All samples and tests shall be performed in accordance with the Standard Specifications for Public Works Construction, North Central Texas Council of Governments (1983) as amended or supplemented."

42. CONSTRUCTION STAKING

Construction staking will not be provided by the Owner.

43. COMPLIANCE WITH GENERAL RULES AND LAWS

"Contractor shall familiarize himself with the nature and extent of the specifications, site conditions, traffic and safety requirements, and comply with all federal, state and local laws, ordinances, rules and regulations. Contractor shall determine how compliance with requirements, laws, rules, and regulations will affect his cost, progress or performance of the Work."

44. COMPLIANCE WITH IMMIGRATION LAWS

"Contractor shall take all steps necessary to ensure that all of the Contractor's employees are authorized to work in the United States as required by the Immigration Reform and Control Act of 1986."

45. RESOLUTION OF DISPUTES

The parties hereby covenant and agree that in the event of any controversy, dispute, or claim, of whatever nature arising out of, in connection with or in relation to the interpretation, performance or breach of this agreement, including but not limited to any claims based on contract, tort or statute, before filing a lawsuit, the parties agree to submit the matter to Alternative Dispute Resolution pursuant to the laws of the State of Texas. The parties shall select a third party arbitrator or mediator from the current list of neutrals on file with the Alternative Dispute Resolution Administrator of the Dallas County District Courts. All forms of Alternative Dispute Resolution may be used except binding arbitration. The proceedings shall be conducted in accordance with the laws of the State of Texas.

SECTION T

TECHNICAL SPECIFICATIONS

SECTION T
TECHNICAL SPECIFICATIONS

I. GENERAL

A. All materials and construction methods for this project shall be in conformance with Town of Addison standards and specifications and the North Central Texas Council of Governments "Standard Specifications for Public Works Construction" (1983), as amended or supplemented. Where conflicts exist, Town of Addison standards and specifications shall govern.

II. SUPPLEMENTAL SPECIFICATIONS FOR INSTALLATION OF TRAFFIC SIGNALS

III. SUPPLEMENTAL LANDSCAPE AND IRRIGATION SPECIFICATIONS

A. Demolition.
B. Earthwork.
C. Tree Protection.
D. Irrigation System.
E. Landscaping.
F. Lawns and Grasses.

IV. SUPPLEMENTAL SPECIFICATIONS FOR BRICK PAVERS

II. SPECIFICATIONS FOR INSTALLATION OF TRAFFIC SIGNALS

INDEX OF SPECIAL PROVISIONS FOR INSTALLATION OF TRAFFIC SIGNALS

1.0 GENERAL NOTES FOR INSTALLING TRAFFIC SIGNALS

1.1 These Special Provisions and the 1983 North Central Texas Standard Specifications for Public Works construction with Amendments where applicable, shall govern the materials and installation of traffic control signals, including illumination, at the intersections and, when required, interconnection conduit between signalized intersections. In the event of a conflict, the Special Provisions shall control.

1.2 This project shall consist of installing materials and equipment necessary for the complete signal system at the proposed location. The Contractor shall install and shall activate completed signals and signal systems in the sequence approved by the Engineer. The Engineer must approve the anticipated sequence of intersection work prior to the work order being issued.

1.3 The total installation shall be in accordance with the applicable sections of the National Electrical Code, all governing local ordinance and regulations, the plans, these special provisions and those sections of the Standard Specifications which apply. All workmanship shall be first class and finished work shall present a neat, uncluttered appearance. The Contractor shall schedule his work so as to cause the minimum

interference to moving traffic and the operation of the existing signal system. Existing signals may be shut down for modification and/or equipment installation only with 72 hour advanced the approval of the Director of Streets. These traffic signal installations consist of the following items:

1. Furnishing and placing all concrete and steel for signal pole foundations.

2. Installation of steel traffic signal poles.

3. Installing necessary conduit and pull boxes.

4. Installing all signal control equipment including controller assemblies signal head assemblies, detector units, AC service, conductors, and all other miscellaneous equipment that is required. The Contractor shall furnish concrete, reinforcing steel, and forms for structure foundations, grouting materials, painting materials, detector loop sawcut and sealing materials, No 12 AWG SHIELDED PAIR stranded wire for connecting the signal heads to the signal cable system, and miscellaneous nuts, bolts, and washers under three-quarters inch (3/4") in diameter. The contractor shall be required to assemble all signal head units.

5. The Contractor will be responsible to maintain existing traffic signal operation at all intersections during the installation of new signals.

6. The Contractor will be responsible for removing the existing traffic signal equipment and hardware (controllers, poles, heads, cable, signs, etc.) at a specified location.

7. Project acceptance will be by individual intersection. The Contractor shall guarantee all work performed and materials he has furnished under this project for a period of twelve (12) months following the date of project acceptance.

NO EXTRA COMPENSATION WILL BE ALLOWED FOR FULFILLING THE REQUIREMENTS STATED ABOVE.

1.4 All materials furnished by the Contractor shall be new undepreciated stock.

1.5 If the Contractor desires to deviate from any of the following procedures or to make substitutions for any materials or equipment, written approval must be obtained from the Owner after a request from the Contractor is made and sample(s) of the substitute materials or equipment is/are furnished to the Owner.

2.0 MATERIALS TO BE FURNISHED BY THE CONTRACTOR

2.1 The Contractor shall furnish all materials necessary to complete the project, including materials for the power connection that are not furnished by the Power Company, and shall install the materials in accordance with the plans and specifications.

2.2 The Contractor shall furnish all labor, tools, equipment, and incidentals necessary to complete the project in an efficient and workmanlike manner.

2.3 Electrical materials and fittings shall conform to the requirements of the National Electrical Code. Electrical fittings shall be approved by the National Electrical Association.

2.4 The Contractor shall furnish painting materials and labor as well as "touch-up" all painted items that are damaged during the installation process (whether previously painted by the contractor or by others). See Section 9.9 Field Painting. The finishing paint appearance will meet the Owner's approval before acceptance of the signal installation is made.

3.0 INSTALLATION OF ELECTRICAL SERVICE

3.1 The contractor shall furnish and install conduit and wire from pull boxes or signal foundations for AC service as shown on plans and as required by the Power Company for traffic signal controllers and street lighting. The Contractor shall coordinate and verify exact requirements for conduit and wire with the Power Company before any work is started. Installation of conduit and wire to the Power Company vaults shall be per the Power Company specifications.

3.2 Unless otherwise called for in the plans, the power connection shall be made to a 115 - 125 volt, single phase, 60 cycle AC supply. The wire used for the power connection shall be a minimum size as indicated on plans and shall be insulated for six hundred (600) volts. The common wire shall be white-coded and the power positive shall be black-coded. The Contractor shall also provide an electrical meter for the signal installation.

3.3 Street light fixture wires (#8 AWG/Thin Wire) shall be installed to signal mast arm poles with luminaries as shown on the plans.

4.0 INSTALLATION OF CONDUIT

4.1 The Contractor shall provide and install underground cable facilities required to satisfy the requirements of the signal system proposed. Cable routing can be accomplished through existing conduits and conduits to be installed by the Contractor as show in the plans. If any of the cable routing paths utilize existing utility company conduits, the Contractor shall be responsible for detailed coordination of proposed cable routing and actual installation with utility company before any work is started. Installation of conduit and cable to other utility manholes shall be per utility company Specifications, which includes adequate ventilation to prevent injury to personnel caused by toxic or harmful gases.

4.2 New Conduit

4.2.1 Unless otherwise shown on plans, all conductors shall be in conduit except when in metal poles. All conduit and fittings shall be of the sizes and types shown on the plans. Each section of conduit shall bear evidence of approval by Underwriter's Laboratories.

4.2.2 Conduit terminating in posts or pedestal bases shall not extend vertically more than 3 inches above the concrete foundation. Field bends in rigid metal conduit shall have a minimum radius of 12 diameters of the nominal size of the conduit. Copperclad ground rods in signal bases shall not extend vertically more than 3 inches above the concrete foundation.

4.2.3 Each length of galvanized rigid metal conduit, where used, shall be reamed and threaded on each end and couplings shall be made up tight. White-lead paint or equal shall be used on threads of all joints. PVC conduit shall be joined by solvent-weld method in accordance with the conduit manufacturer's recommendations. No reducer couplings shall be used unless specifically indicated on the plans.

4.2.4 All conduit and fittings shall have the burrs and rough places smoothed and shall be clean and free of obstructions before the cable is installed. Field cuts shall be made with a hacksaw only, and shall be square and true so that the ends will butt or come together for the full diameter thereof. In no case shall a cutting torch be used to cut or join conduit. Slip joints or running threads will not be permitted for coupling conduit unless approved by the Owner. When a standard coupling cannot be used, an approved union coupling shall be used and shall provide a water-tight coupling between the conduit. All couplings shall be properly installed to bring the ends of connected conduit together to produce a good rigid connection throughout the entire length of the conduit run. Where the coating on a conduit run has been damaged in handling or installation, such damaged parts shall be thoroughly painted with rust preventive paint. Ends of conduits shall be capped or plugged until installation of wire. Upon request by the Owner, the Contractor shall draw a full-size metal wirebrush, attached by swivel joint to a pull tape, through the metal conduit to insure that the conduit is clean and free from obstructions. The conduits shall be placed in an open trench at a minimum 24 inches depth below the curb grade in the sidewalk areas, or 18 inches below the finished street grade in the street areas.

4.2.5 Conduit placed for concrete encasement shall be secured and supported in such manner that the alignment will not be disturbed during placement of the concrete. No concrete shall be placed until all of the conduit ends have been capped and all box openings closed.

4.2.6 PVC conduit, which is to be placed under existing pavement, sidewalks, and driveways, shall be placed by first providing a void through which the PVC conduit shall be inserted. The void may be made by either boring or jacking a mandrel. Metal conduit, which is to be placed under existing pavement, sidewalks, and driveways, shall be placed by jacking or boring.

4.2.7 Pits for jacking or boring shall not be closer than 2 feet to the back of the curb or the outside edge of the shoulder unless otherwise directed by the Owner. The jacking and boring method used shall not interfere with the operation of street, highway, or other facility, and shall not weaken or damage only embankment structure, or pavement. Heavy jacks are to be used for jacking. Boring is to be done by mechanical means providing a maximum one inch overcut for the conduit to be placed, and use of water or other fluids in connection with the boring operating will be permitted only to the extent to lubricate cuttings. Water jetting will not be permitted.

4.2.8 Where conduit is to be placed under existing asphaltic pavement, the jacking method is to be used unless written approval is given by the Owner for placement of conduit by boring.

4.2.9 Backfill for all excavations shall be tamped with mechanical tamps in six inch (6") layers to the density of the surrounding ground.

4.3 Existing Conduit

4.3.1 Prior to pulling cable in existing underground conduit to be reused in the system, the conduit shall be cleaned with a mandrel or cylindrical wire brush and blown out with compressed air. If conduit appears to be blocked, the contractor shall make an attempt to clear the conduit by rodding. (The Contractor will not receive extra compensation for rodding). The Owner shall be notified prior to disconnection or removal of the existing interconnect cable.

4.3.2 Where existing conduit is found to be unusable (conduit has collapsed or the cable is unable to be pulled from the existing conduit), the Contractor shall, upon approval by the Owner, install new rigid metal or P.V.C. conduit.

5.0 INSTALLATION OF CABLE

5.1 General

5.1.1 The cables shall be installed in the conduit. The conduit must be continuous, reasonably dry, completely free of debris, and without sharp projections, edges or short bends. If so required by the Owner, the Contractor shall demonstrate that the conduit is dry and free of debris by pulling a swab and/or mandrel through the conduit. The conductors shall be installed in such a manner and by such methods so as to insure against harmful stretching of the conductors or damage to the insulation. Installation methods shall conform to the recommendations of the cable manufacturer. The Contractor shall furnish at least two copies of the manufacturer's recommendations, which includes: methods of attaching pull cable, pulling tension per conductor size and per radius of conduit bend, and the type of lubricant to be used.

5.1.2 All cables in a given conduit run shall be pulled at the same time and the conductors shall be assembled to form one loop in such a manner that the pulling tension is distributed to all the cables. Long, hard pulls will necessitate the use of pulling eyes. For short runs, the cables may be gripped directly by the conductors by forming them into a loop to which the pull wire or rope can be attached. The insulation on each conductor shall be removed before the loop is formed. The method used will depend on the anticipated maximum pulling tension in each case.

5.1.3 In many instances, existing conduits which contain signal cable are to be used for the installation of new cables. In such locations, where new cables are to replace all existing cables, the existing cables may be used to pull in the new cables. At locations where new cables are to be added to existing cable runs, the existing cables shall first be pulled out, then replaced, adding the new cables to the existing cables to form one cable pull. Installation shall be done in such a way as to prevent damage to the existing and/or new cables. In the event of damage, the Contractor shall bear the responsibility of material and labor for replacement of defective cables.

5.1.4 All conduit runs shall be measured accurately and precisely for determining cable lengths to be installed. A measuring device shall be inserted into the conduit, and the length shall be measured (to the nearest foot) from entry point to exit point. All conduit run measurements shall take place in the presence of the Engineer or the Inspector. The

Contractor shall record all cable measurements and include the distances in the as-built drawings. In locations where new cables are to replace existing cables, the Contractor may use the removed cables as a measuring device to determine the lengths of the removed cables to be installed, however, this does not relieve the Contractor of his responsibility to record accurate measurements of all cable lengths.

5.1.5 The manufacturer's recommended maximum pulling tensions shall not be exceeded under any circumstances. If so required by the Owner, the Contractor shall insert a dynamometer in the pull wire as the cables are being pulled into the conduit to demonstrate that the maximum tensions are not being exceeded. The cable shall be fed freely off the reel into the conduit without making a reverse curve. At the pulling end, the pull wire and cables shall be drawn from the conduit in direct line with the conduit. Sheaves or other suitable devices shall be used as required to reduce any hazards to the cable during installation. The cables shall be adequately lubricated to reduce friction and further minimize possible damage. Such lubricants shall not be the grease or oil type used on lead sheathed cables, but shall be one of several commercially available wire pulling compounds that are suitable for P.V.C. sheathed cables. They shall consist of soap, talc, mica, or similar materials and shall be designed to have no deleterious effect on the cables being used.

5.1.6 The cables shall be neatly trained to their destinations in manholes, cabinets, pole bases, pull boxes, and all other terminations. The cable manufacturer's recommended values for the minimum bending radii to which cables may be bent for permanent training during installation shall be adhered to. These limits do not apply to conduit bends, sheaves or other curved surfaces around which these cables may be pulled under tension while being installed. Larger radius bends are required for such conditions.

5.2 Wire and Cable

5.2.1 All wire and cable shall conform to the requirements shown on the plans, except wire and cable specifically covered by other items of this contract. The minimum size of conductors shall be as indicated on the plans.

5.3 Controller Cabinet Wiring

5.3.1 Wiring for the controller shall consist of connecting: (1) wires to signals, (2) wires to detectors, (3) the power wires, (4) the ground wires, (5) the pedestrian push-button wires, and (6) the interconnect wires to their respective terminals in the cabinet. At the controller cabinet, the signal conductors from the field shall be stripped back and insulated solderless lugs crimped to wire. These "lugs" shall be inserted under the binder head screw and tightened securely. Other wiring for the controller shall be as required by the wiring diagrams and instructions furnished with the controller by the manufacturer.

5.3.2 All field wiring in cabinets shall be neatly installed. Incoming cables shall be trained to their destination and neatly laced together. All spare wires shall be trimmed, and neatly coiled with the ends taped. Detector lead-in cables shall have their insulation jackets removed from the terminal strip connection unsheathed to the bottom of the cabinet, and have the ground wires tied together in the bottom of the cabinet.

5.3.3 Pedestrian push buttons shall have a common ground wire that is completely isolated and independent from all other ground wires. This wire shall be connected to the designated terminal in the controller cabinet.

5.4 Signal Head Wiring

5.4.1 Wiring for the signal head shall consist of connecting the terminal block in each signal section to the common terminal block in each signal face to the terminal block in the signal-head terminal compartment. All such connecting wires shall be number twelve (12 ga.) stranded American Wire Gauge (AWG). All conductors running from any terminal points located in the pole or transformer base to the signal-head terminal shall likewise be number twelve (12 ga.) stranded AWG wire. The contractor shall furnish the No. 12 ga. stranded AWG wire for this task.

5.5 Terminals

5.5.1 Except for controllers, the ends of all stranded wires which are to be attached to terminal posts shall be provided with solderless terminal lugs that meet the requirements of the National Electrical Code. Terminal lugs on solid wires are prohibited.

5.6 Splices

5.6.1 Splices inside conduit runs and in loop detector T.H.W. wire are absolutely prohibited. Except for detector lead-in cables, all splices shall be made above ground. Splices in pull boxes are prohibited unless specific written permission has been issued by the Owner.

5.6.2 Splicing methods shall be in accordance with good electrical practice and the cable manufacturer's recommendations. All materials used shall be high quality and specifically intended for these purposes. The cables shall be trained to their final position and cut to proper lengths. The jacket and insulation shall be removed as required. In doing this, use proper care to insure against nicking the conductors. The connector shall be installed tightly and all burrs, rough edges, etc. shall be removed. If required in the plans or by the Owner, the connection also shall be soldered. Heat shall be applied by use of hot solder. Heating the connection with a direct flame will not be permitted. Care shall be used to protect the insulation when soldering. The entire surface shall be cleaned taking special care in cleaning the outside jacket in order to remove the wax finish. Before the first layer of tape is wrapped, the entire area shall be coated with an electric grade rubber element. After this solvent has dried, the connection shall be insulated with electrical grade rubber splicing compound tape to proper thickness. This tape requires a pressure and temperature in service to complete its vulcanizing process and thus be stretched to 2/3 width when applied. The completed splice shall be covered with a half-lap layer of vinyl plastic electrical tape. This wrapping shall be smooth but the tape shall not be stretched more than necessary.

5.6.3 Splices in communications cables shall include the shield. Splices between cable pairs shall be made with "Scotchlock" brand solderless connectors designed for this specific application. The completed splice shall be insulated with a re-enterable plastic splice case. Splices at points other than those shown on the plans may be made only with the written permission of the Owner.

5.6.4 The Owner shall select at random at least 5 splices to be thoroughly inspected. The Contractor shall, in the presence of the Owner sectionalize the splice to expose the various layers of materials and the connector. The splice shall be thoroughly checked for compliance to these special provisions. The splice shall then be remade by the Contractor. This work shall not require extra payment, but is considered subsidiary to other items in the contract. All of the splices selected for this inspection shall conform to the requirements of these special provisions. If any splices fail to meet these requirements, ten (10) more splices shall be selected at random by the Owner for inspection.

5.7 Enclosed Wiring

5.7.1 All cables and signal conductor wire above the ground surface shall be enclosed in approved metal conduit up to but no closer than one foot of the lowest power conductor. Power-tap lines carried down poles shall be placed in metal conduit.

5.8 Identification of Signal Wires

5.8.1 IMSA color coded signal cable shall be used for all signal and interconnect systems. Colors shall be continuous from the point of origin to the point of termination. Splices will be permitted only if same colors are spliced.

5.8.2 Communication and detector lead-in cables shall be clearly identified by use of metal or plastic tags. For example: System Detector Eastbound Right Lane.

6.0 GROUNDING

6.1 There shall be a properly installed and connected ground rod for each controller cabinet and power drop to reduce any extraneous voltage to a safe level. The ground rod shall be located so as to minimize the length of the grounding-conductor run. All grounding circuits shall be substantial and permanent and shall be electrically continuous with an ohms-to-ground resistance not to exceed 10 ohms when tested by volt-ohm-meter.

6.2 Grounding Connectors and Electrodes

6.2.1 The grounding conductor shall be a No. 6 AWG standard copper wire. The conductor shall be bonded to ground rods. Ground rod electrodes shall be solid copper-bonded steel being at least 5/8 inch in diameter and shall be driven into the ground to a depth sufficient to provide the required resistance between electrodes and ground (10 ohms). All ground rods shall be a minimum of six feet long. When the location precludes driving a single ground rod to a depth of six feet or when a multiple ground rod matrix is used to obtain the required resistance to ground, ground rods shall be spaced at least six feet apart and bonded by a minimum No. 6 AWG copper wire. Connections to underground metallic conduit shall be considered sufficient for grounding requirements. Connection of grounding circuits to grounding electrodes shall be by devices which will ensure a positive, fail-safe grip between the conductor and the electrode (such as lugs or pressure connectors). No splice joint will be permitted in the grounding conductor.

7.0 VEHICLE LOOP DETECTOR INSTALLATION

7.1 This section specifies the Contractor's responsibility for the loop and lead-in installation for vehicle loop detectors. It is required that all work related to the installation of a particular loop, with the exception of the layout task, shall be completed in the same work day. Loop installation work shall be performed during off-peak traffic hours. Loop installation shall not be made during any type of precipitation or when pavement is wet from landscape irrigation systems.

7.2 The installation of loop detectors shall occur as shown in the Plans. The lead-in saw cuts from the street to the pull box shall maintain a minimum separation from other loops of 6 inches. The saw cut depth, as specified in the plans, shall be consistent, including the entry point into the curb. The maximum number of wires placed in a single saw slot shall be four (4) wires. All wires in saw slots shall be a minimum of one inch (1") below the street level grade. The maximum number of wires placed in any lead-in saw cut from the street to curb side shall be two (2).

7.3 The Contractor shall furnish the sealing compound for the loop detectors at his expense. Samples of the sealant and methods for sealant installation shall be submitted to the Engineer for his approval before any detector installation may begin. If a hot sealant is used, the temperature of the sealant shall be in a range that will not cause damage to the detector wires. Loop sealant shall completely fill the saw cut, but shall not be more than three inches (3") in width on the street surface. The Contractor shall be required, at his expense, to remove all excess sealant, otherwise the loop will not be considered as a completed item.

7.4 Detector lead-in cables shall be run continuously without splices from the curbside pull box to the controller, where possible. If splices must be made, they shall be made in a signal base. Splices shall be solder connected (including the ground wire) and the splice connection shall be insulated and waterproofed with scotchcoated materials. Splices at the curb side pullboxes shall also be made in the same manner (See Section 5.6 Splices). The Owner shall pre-approve any splice in detector cables.

7.5 Each detector loop shall penetrate the curb in a separate conduit.

8.0 CONCRETE FOUNDATIONS FOR SIGNAL STRUCTURES

8.1 Concrete foundations for signal structures shall be located so that the closest structure leg is a minimum of four (4) feet from the back of vertical curbs. The Contractor shall probe before excavating foundations to determine the location of utilities and structures. Foundations shall be paid for once, regardless of extra work caused by obstructions. The Contractor shall furnish all supplementary items necessary for its proper installation.

8.2 Excavation for all required foundations shall be done in accordance with lines and depths indicated on the plans. All loose material shall be removed from the excavation before the concrete is placed. Any water shall be removed by pumping or bailing. The use of explosives will not be permitted.

8.3 Foundations shall be constructed to the dimensions shown on the plans or as directed by the Owner. The Contractor shall be required to insure that the top of the finished foundation is exactly level and formed. Anchor bolts and conduits shall be held rigidly in place by template until the concrete is set. A mechanical vibrator shall be used for compacting and working the concrete. After the concrete has been placed and the top struck off, it shall be covered with wet cotton or burlap mats, for not less than ninety-six hours. All bracing and templates for anchor bolts shall remain in place for ninety-six (96) hours after the concrete is poured. During that time, the anchor bolts and conduit shall not be subjected to any applied strain. The Contractor shall furnish the Owner a level for the purpose of inspecting the foundation. Signal pole shall not be installed on any foundations until approval has been given by the Owner.

8.4 Backfill shall be tamped with mechanical tamps in 6-inch layers to the density of the surrounding ground. Where excavation is made in the surfaced shoulder, the shoulder shall be replaced with material equal to the original composition.

8.5 All excavated material not required for backfill shall be promptly removed and disposed of by the Contractor outside the limits of the project. The work site shall be kept clean and neat at all times.

8.6 No concrete shall be placed when the atmospheric temperature is at or below 40 degrees F. (taken in shade away from artificial heat) unless permission to do so is given by the Owner.

9.0 TRAFFIC SIGNAL POLE SYSTEMS

A Traffic Signal Pole System shall consist of a pole with 4 anchor bolts, a transformer base, and a mast arm for support of signs and traffic signals as detailed on the plans.

9.1 Materials:

9.1.1 Fabricator: Fabricator shall be Certified under Category I, "Conventional Steel Structures" as set forth by the American Institute of Steel Construction Quality Certification Program. Proof of this certification will be required with the bid submittal to assure that the fabricator has the personnel, organization, experience, procedures, knowledge, equipment, capability and commitment to fabricate quality Lighting Pole structures.

9.1.2 Design: Pole shaft, base plate, anchor bolts, mast arm, transformer base, and structural connecting hardware, shall be designed in accordance with the requirements of the 1985 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals". Loading shall be based on an isotach wind velocity of 80 mph. Analysis shall include varying wind directions 360 degrees around the pole in increments of 5 degrees. Calculations and detail drawings shall be submitted for verification of compliance to these specifications.

9.1.3 Tubular members: The tubular member's cross section shall be round and shall have a constant linear taper of 0.14 in/ft. It shall be fabricated from United States produced coil or plate steel conforming to the requirements of ASTM A595 Grade A or ASTM A572 Grade

65. Tubular members 50-feet or less in length, shall be of the same thickness throughout the length of the entire member.

9.1.3.1 Mast Arms shall have a horizontal length as called for on the plans. All mast arms that are 50-feet and less shall be manufactured and shipped in one piece with no circumferential splices. Each arm shall be provided with a zinc die cast end cap secured in place with set screws and a through bolt.

9.1.3.2 Pole shafts: Each pole shaft shall be 19 feet in height and be provided with a pole cap secured in place with set screws or other suitable fasteners. A "J-hook" wire support and grounding attachment shall also be provided in each pole shaft.

9.1.4 Base plate: The base plate shall be of steel meeting or exceeding the requirements of ASTM A36 or ASTM A572 Grade 42. It shall be integrally welded to the pole shaft with either a telescopic welded joint or a full penetration butt weld with a backup bar.

9.1.5 Transformer base: Transformer base shall have walls 0.25-inches thick constructed of coil steel, with top and bottom plates which are 1.75 inches thick constructed of A36 grade steel. The bolt circle for attaching pole to transformer base shall be adjustable from 18" to 20", with a 10" center hole, and shall be 18" square at top. The bolt holes shall be 1.63" x 2.63", and shall be slot shaped. There shall be a 7 gauge door in the side of the transformer base secured with two (2) - 0.38" x 0.63" long hex head screws. The door opening shall be 8" x 10.5" x 10.5" x 19.5". The bottom of the transformer base shall be 24" square, with four (4) -2.25" diameter holes, with a 24" diameter bolt circle, and an 18" center hole. The overall height shall be 24". There shall be a 0.50" nut holder for grounding attached inside the transformer base. The finish shall be painted match pole finish, and shall be coordinated with the pole manufacturer.

9.1.6 Anchor bolts: Anchor bolt material shall conform to the requirements of AASHTO M314 Grade 55. The bolts shall be galvanized to ASTM A153 for a minimum of 12" on the threaded end. 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.

9.1.7 Welding: Welding shall be in accordance with AWS (American Welding Society) Structural Welding Code D1.1 Sections 1 through 8 and shall be performed by welders certified in accordance with the AWS Code. The Tube's longitudinal seam welds shall be free of cracks and undercutting, performed with automatic processes, and visually inspected with questionable areas inspected by magnetic particle to AWS D1.1.

9.1.8 Packaging: All components shall have a protective wrapping on them during shipping. A wrapping of 3/16" U.V. inhibited plastic backed packing foam shall be applied prior to shipment on small poles. Larger poles shall be cradled in a 1" rubberized foam base.

9.1.9 Material certifications: All materials and products shall be produced in the United States of America. They shall be of the ASTM type as called forth in this specification. Mill certifications shall be supplied for proof of compliance to this specification.

9.2 The Contractor shall provide a complete traffic signal structure location plan/or schedule showing all pertinent details for each standard. This plan shall be approved by the Owner before any structure is installed.

9.3 The Contractor shall examine foundations, which are to receive traffic signal standards, to assure proper anchorage alignment. Report any discrepancies to the Owner.

9.4 Signal poles shall be leveled and tightly secured to the foundation before the structure is placed on the base. If shims are required for leveling, total shim height shall not exceed 1/2 inch. Foundation anchor bolts shall extend a minimum of three (3) threads through each nut in the base.

9.5 Except as modified herein, erection shall be in accordance with the applicable Specifications and Standards of the AISC Manual of Steel Construction. Erecting equipment shall be suitable for the work and shall be in first class condition. Where parts cannot be assembled or fitted properly as a result of errors in fabrication or deformation due to handling or transportation, such condition shall be reported immediately to the Owner for approval of the method of correction obtained. The straightening of plates and angles or other shapes shall be approved methods. Bent or damaged heat-treated parts will be rejected. Steel work shall be drained properly. Pockets in structures exposed to the weather shall be filled with an approved waterproof material. The erector will be responsible for shrinkage and distortion of all butt welds. Moment connections in the field on beams and girders shall have a minimum of 3/16 inch root opening for all flange preparations prior to welding. Loose joints shall be corrected by cutting with a hand guided torch if necessary.

9.6 The steel structure frame shall be carried up true as shown and all match marking shall be followed. Temporary bracing shall be used wherever necessary to support all loads to which the structure may be subjected, including equipment, operation, and material loading. Such bracing shall be left in place as long as may be required for safety. The various members, after being assembled, shall be aligned and adjusted accurately before being fastened. Fastening of splices on compression members shall be done after the abutting surfaces have been brought completely into contact. No welding or bolting shall be done until as much of the structure as will be stiffened thereby has been aligned properly.

9.7 Bearing surfaces and surfaces which will be in permanent shall be cleaned before the members are assembled. Bearing plates shall be set in exact position and shall have a full and even bearing upon the concrete. As erection progresses, the work shall be bolted to take care of all dead load, wind and erection stresses. Splices will be permitted only where indicated. All erection bolts used in welded construction may be tightened securely and left in place. If removed, the holes shall be filled with plug welds.

9.8 Field bolting shall be in accordance with the requirements specified for shop fabrication. Unfair holes shall be corrected by reaming. Where the surface of a bolted part has a slope of more than 1:20 a beveled washer shall be used to compensate for the lack of parallelism. Bolt heads and nuts shall be drawn tight against the work with a suitable wrench not less than 15 inches long. Bolt heads shall be tapped with a hammer while the nut is being tightened.

9.9 Field welding shall be as specified for shop fabrication of welded construction. Any shop paint on surfaces adjacent to joints to be field welded shall be wire brushed to reduce the paint film to a minimum.

9.10 Two sets of shop drawings containing all of the traffic signal pole system components shall be submitted to the Owner prior to construction for approval. These drawings must be sealed by a registered Texas Professional Engineer.

10.0 INSTALLATION OF SIGNAL HEADS

10.1 The Contractor shall be required to assemble all signal head units as specified in the plans or as directed by the Engineer. The Contractor shall mount the signal heads within standards level and plumb. The Contractor shall position and secure the signal heads so they are visible at a minimum of 200 feet from the stop bar.

10.2 All signal heads or parts of heads not in operation shall be covered with burlap until placed into operation. When the signal heads become operational, all existing heads no longer required shall be removed immediately.

10.3 All mast arm heads installed shall require ASTRO-BRAC mounting. The Contractor shall be required to drill the mast arm at the point where the wire enters the mast arm. No Alternate signal head mounting hardware will be acceptable by the Owner.

10.4 All pipework in each signal head assembly shall be completely tight. Signal and pedestrian heads shall be securely tightened immediately after signal head assembly has been installed. If any signal head assembly is found to be loose or asymmetrical in any manner, the Contractor shall be required to remove and rebuild the signal head assembly to the satisfaction of the Engineer.

10.5 All signal cables from the heads to the pole base shall be totally enclosed within the signal mounting hardware.

11.0 INSTALLATION OF GRAPHICS/SIGNS

11.1 Perform all work required to complete the identifying graphics/signs indicated by the plan details and furnish all supplementary items necessary for their proper installations.

11.2 Installation: The Contractor shall clean all surfaces to which graphics are to be applied according to manufacturer's written instructions. Level grid lines of tape shall be incorporated for graphic application. All copy shall be set in normal letter spacing and standard inter-work spacing shall be made as required by the Owner.

12.0 PAINT AND PAINTING

12.1 Work Included

The work includes, but is not necessarily limited to, furnishing of materials and equipment and completion of painting and painters finish on exposed surfaces as required, including exterior steel.

Thoroughly examine specifications, site of work and conditions under which work will be performed before submitting a proposal. Surfaces which cannot be prepared or painted as specified shall be immediately brought to the attention of the Owner's representative in writing.

12.2 Work Not Included

As directed by the specifications.

12.3 Product Delivery Storage and Handling

Deliver materials in sealed containers with manufacturers labels intact. Store materials in protected area at temperatures between 50°F or above 110° F.

12.4 Job Conditions

Apply coatings only under the following prevailing conditions.

12.4.1 Air and surface temperatures are not below 50° F or above 120° F., unless noted otherwise on the product data sheets and labels.

12.4.2 Relative humidity is not above 85 percent and the surface temperature is at least 5° F above dew point.

Protect all surfaces not to be coated.

12.5 Project Conditions

Environmental Requirements: Comply with current Texas Air Quality regulations as to conditions under which coatings and coating systems can be stored and applied. Complete containment of all paint removed that contains lead is mandatory.

12.6 Quality Assurance

Mock-ups (If applicable) shall serve to determine the standard of acceptance for the finished installed product. Mock-up will serve as compatibility test between existing and new system.

12.7 Approved Materials

Two paint processes have been approved for this project. The first is an epoxy/enamel paint process. The second is a powder applied process. The materials for both are shown below:

12.7.1 Epoxy/Enamel Painting

12.7.1.1 Rust inhibitive Polyamide Epoxy--Series 65-1255 Poxiprime

12.7.1.2 Acrylic Polyurethane Enamel--Series 75 Endura-Shield

Tnemec Company, Inc., Kansas City, MO. (816) 483-3400 has been approved by the Owner for this type painting.

12.7.2 Powder Painting

12.7.2.1 Exterior Coating - All exterior surfaces shall be coated with a Urethane or Triglycidyl Isocyanurate (TGIC) Polyester Powder to a minimum dry film thickness of 2.0 mils. The coating is electrostatically applied and cured in a gas fired convection oven by heating the steel substrate to a minimum of 350 degrees Fahrenheit and a maximum of 400 degrees Fahrenheit. The exterior color shall be **Dark Bronze.**

12.7.2.2 Interior Coating - A minimum of 2-feet at the base end of the pole shaft shall be coated with a minimum of 2 mils of a Gray Zinc Rich Epoxy Powder cured in a gas fired convection oven by heating the steel substrate to a minimum of 350 degrees Fahrenheit and a maximum of 400 degrees Fahrenheit.

12.7.2.3 Equivalent materials of other manufacturers may be substituted only by approval of the Owner. Requests for substitution shall include manufacturer's literature for each product giving the name, generic type, descriptive information, solids by volume, recommended dry film thickness and a list of five projects where each product has been sued and rendered satisfactory service. No request for substitution shall be considered that would decrease film thickness or offer a change in generic type of coating specified. Certified test results showing that the substitute product(s) equal or exceed the performance of the specified products shall be submitted.

12.8 Colors

12.8.1	Primer & Spot Primer:	1255 Beige, or approved equal.
12.8.2	Finish:	BM07 No. 313 Dk. Bronze, or approved equal.

12.9 Material Preparation

Mix and thin materials according to manufacturers printed instructions. Do not mix materials beyond manufacturers pot life.

12.10 Prework Inspection

12.10.1 Examine surfaces to be coated and report any conditions that would adversely affect appearance or performance of the coating systems and which cannot be put into acceptable condition by the preparatory work specified in Paragraph 3.02.

12.10.2 Do not proceed with surface preparation and application until the surface acceptable or authorization to proceed is given by the Owner's representative.

12.11 Surface Preparation

12.11.1 General - Remove all surface contamination. Surface must be clean and dry.

12.11.2 Exterior ferrous metal: The exterior steel surface is blast cleaned to Steel Painting Council Surface Preparation Specification No. 6(SSPC-SP6) requirements. The inside steel surface shall be cleaned to SSPC-CP3 requirements a minimum of 2-feet at the base end of the pole.

12.12 Application

12.12.1 Apply materials at specified film thicknesses by method recommended by manufacturer.

12.12.2 Allow each coat to dry thoroughly before recrating. Follow manufacturer's recommended redcoat time.

12.12.3 Cut edges clean and sharp where work joins other materials or colors.

12.12.4 Make finish coats smooth, uniform in color, and free of brush marks, laps, runs, dry overspray and skipped or missed areas.

12.13 Inspection

Request acceptance of each coat before applying succeeding coats. Touch-up and repair all work that is not acceptable to the Owner's representative and request final acceptance.

12.14 Cleaning

Remove paint spatters from glass, plumbing fixtures, and adjoining surfaces. Repair any damage to coatings or surfaces caused by cleaning operations. Remove debris from jobsite and leave storage areas clean.

12.15 Painting Schedule

Prepare coatings and finish all surfaces specified and agreed upon.

EXTERIOR Ferrous Metal:

Spot Primer:	Tnemec Series 65-1212 Poxiprime	2.0- 3.0 mils
Primer:	Tnemec Series 65-1212 Poxiprime	2.0- 3.0 mils
Finish:	Tnemec Series 75 Endura-Shield	3.0- 5.0 mils
	Total Thickness =	5.0- 8.0 mils

13.0 LANDSCAPING, SPRINKLER SYSTEMS, AND OTHER PRIVATE PROPERTY/PUBLIC PROPERTY

13.1 The Contractor shall assume full responsibility for the preservation of the existing landscaping (sod, trees, bushes, other ground cover), sprinkler systems, and other private property at the site during the installation of items in this Contract Document. Damaged landscaping, sprinkler systems and other private property shall be replaced by the Contractor at his own expense, to the satisfaction of the Owner. The sprinkler system is owned by the Addison Place Homeowners Association, which contracts out maintenance of the sprinkler system. The sprinkler system will be field located prior to construction.

13.2 The Contractor shall replace all landscaping with same kind and size as originally planted unless otherwise noted, at no cost to Owner. No shrubs shall be replaced along the relocated brick wall. Trees should be replaced at start of next planting or digging season. In such cases, remove dead trees immediately. Protect irrigation system and other piping conduit or other work during replacement. Repair any damage immediately.

13.3 Lawns and Grasses

Grass shall be replaced and/or added at locations that previously contained grass or within the right-of-way where sidewalks and shrubs are not present.

13.3.1 General

13.3.1.1 Description: provide topsoil, fine grading, fertilizer, sodding and hydromulching of either Bermuda grass or Ryegrass followed by a subsequent Bermuda application. Grass varieties are to be preapproved by Owner.

13.3.1.2 Product Delivery, Storage and Handling: Deliver fertilizer, as specified, to site in original, sealed containers bearing manufacturer's guaranteed statement of analysis. Store fertilizer in weatherproof location.

13.3.1.3 Quality Assurance:

13.3.1.3.1 Water: Water will be available on site. Provide necessary hoses and other watering equipment required to complete work.

13.3.1.3.2 Maintenance: Until final acceptance and until an approved stand of grass is achieved, maintain plantings by watering, cultivating, mowing, weeding, spraying, cleaning and replacing as necessary to keep plants in a vigorous, healthy condition.

1. Watering: As necessary to keep top 2 inches of soil moist. Coordinate with Irrigation Contractor.

2. Mowing: Mow newly planted grass areas weekly after initial growth reaches 2 1/2 inches.

3. Weeding: Remove weeds and foreign grass over plant areas at least once a week. Herbicides may be used only when approved by Architect/Owner.

4. Condition of Surfaces: Lawn areas will be graded with a minimum of 6 inches of topsoil as provided in Earthwork section. If in the opinion of the Architect/Owner the soil is compacted, rotor till to a depth of 4 inches.

5. Acceptance: The work will be accepted when a completed, undamaged stand of grass is achieved as approved by Owner.

6. Seeding Schedules: Bermuda grass, complete between May 1 and September 15.

7. Sodding Schedules:

   A. Sodding operations can be performed year round weather permitting. Do not install sod on frozen ground or if forecast calls for freezing conditions.

   B. Do not place sod without prior approval from Owner.

13.3.2 Materials

13.3.2.1 Grasses:

13.3.2.1.1 Seed: Bermuda grass (Cynodon Dactylon): Extra fancy, hulled and treated lawn type seed with purity of 95% or better and germination of 85% or better and per requirements of Texas Seed Law. Weed content less than 1/2%. No noxious weeds.

13.3.2.1.2 Sod: Kentucky (KY-31) Fescue and Common Bermuda Grass (Cynodon dactylon). Free of foreign weeds and grasses. Cut sod with a full 3/4 inch heavy clay soil covering roots. Do not cut sod more than 48 hours prior to planting.

13.3.2.2 Fertilizer:

13.3.2.2.1 Provide a complete fertilizer, part of elements of which are derived from organic sources and shall include trace elements. Fillers to be sulphur and iron sulphate.

1. First Application: 10-10-10 or similar analysis with minimum 8% sulphur and 4% iron, plus micronutrients.

2. Second Application: 20-5-10 or similar analysis. nitrogen source to be a minimum 50% slow release organic Nitrogen (SCU or UF) plus minimum 8% sulphur and 4% iron plus micronutrients.

3. Mulch Fiber: Virgin wood fiber for hydromulch - Weyerhauser or Conweb with green color additive.

4. Tackifier: Natural, non-asphaltic vegetable gum with gelling and hardening agents.

5. Sharp Sand: Clean, washed sand (fine aggregate) - ASTM C-33.

13.3.3 Execution

13.3.3.1 Preparation: Grading: Verify that lawn areas have been graded as provided in Earthwork.

13.3.3.2 Final Grading/Seed Bed Preparations:

13.3.3.2.1 Loosen areas to be grassed and fine rake to break up lumps and produce a smooth, even grade, free from unsightly variations, ridges or depressions.

13.3.3.2.2 Remove and dispose of stones one (1) inch or larger, sticks, roots, other debris and grass stubble exposed during this operation.

1.3.3.3.2.3 Do not vary final grades more than 0.1 foot from finish elevations.

1.3.3.3.2.4 Receive approval of fine grading from Owner prior to grass planting.

13.3.3.3 Fertilizing:

13.3.3.3.1 First Application: Distribute 10-10-10 fertilizer uniformly at rate of 15 pounds per 1,000 square feet after initial germination.

13.3.3.3.2 Second Application: Repeat fertilization with 20-5-10 commercial fertilizer after first two cuttings at rate of 15 pounds per 1,000 square feet.

13.3.3.3.3 Water: Immediately water in fertilizer after each application.

13.3.3.4 Grass Planting:

13.3.3.4.1 Sodding: After final grading, place sod so edges are touching. Lay across any changes in elevation. Lightly top dress with sharp sand to fill voids and grade smooth. Roll to eliminate undulations.

13.3.3.4.2 Hydromulching:

1. At time of seeding, soil to be moist but not muddy and wind velocity shall not exceed 10 miles per hour. Add water if required to moisten soit.

2. Hydromulch Bermuda grass seed evenly at a rate of two (2) pounds per 1,000 square feet with wood cellulose fiber at a rate of fifty (50) pounds per 1,000 square feet.

3. Add tackifier to mix for slopes 4:1 or greater at a rate of one (1) pound per bag of mulch.

13.3.3.5 Performance:

13.3.3.5.1 Establish a dense lawn of permanent grasses, free from lumps and depressions.

13.3.3.5.2 Reshoot any area failing to show uniform cover. Such replacement shall continue until a dense lawn is established. Scattered bare spots will not be allowed.

13.3.3.5.3 Mow and edge lawn a minimum of three times, each time after lawn has reached a height of 21/2 - 3 inches. Mow to a height of 2 inches.

13.3.3.6 Grade Maintenance and Erosion Damage:

13.3.3.6.1 Maintain original grades of lawn areas after commencement of planting and during maintenance period.

13.3.3.6.2 Provide surface repair to ruts, ridges, tracks. Replant areas required for final acceptance.

13.3.3.7 Acceptance: The work will be accepted when a completed, undamaged stand of grass is achieved, as approved by Architect/Owner.

13.3.3.8 Clean Up: Keep premises neat and orderly including organization of storage areas. Remove trash and debris resulting from lawn preparation from site daily as work progresses. Leave paved areas in a broom clean condition by sweeping or hosing.

13.4 Warranty landscaping for one year after final acceptance. Replace dead materials and materials not in vigorous, thriving condition as soon as weather permits and on notification by the Owner. Replace plants, including trees, which in opinion of Owner have partially died thereby damaging shape, size, or symmetry. Warranty excludes replacement of plants after final acceptance because of injury by storm, drought, drowning, hail, freeze, insects or diseases. At end of warranty period, staking and guying materials shall be removed from the site by the Contractor at no additional costs.

14.0 REMOVAL AND REPLACEMENT OF CURBS AND WALKS

14.1 The Contractor shall secure permission from the proper authority and the approval of the Owner before cutting into or removing any walks or curbs which might be required in making the installation.

14.2 After the work is completed, the Contractor shall restore any curbs or walks which have been removed to the equivalent of, or better than, their original condition and to the satisfaction of the Owner.

15.0 SAMPLING AND TESTING

15.1 Initial testing of all materials, construction items, or products incorporated in the work will be performed at the direction and expense of the authority including initial compaction and density tests deemed necessary in connection with the construction of embankment, backfill of structures, excavation.

15.2 In the event a material, construction item, product incorporated in the work, embankment, backfill, excavation or any other item tested fails to satisfy the minimum requirements of the initial test described above, appropriate prove-out tests shall be made as directed by the Owner to determine the extent of the failure and to verify that the corrective measures have brought the item up to specification requirements. The cost of all

testing necessary to determine the extent of the failure and the adequacy of the corrective measures shall be the responsibility of the Contractor.

15.3 The failure of the proper authority to make any test of materials shall in no way relieve the Contractor of his responsibility of furnishing materials conforming to the specifications.

15.4 Tests, unless otherwise specified, shall be made in accordance with the latest methods of the American Society for Testing and Materials. The Contractor shall provide such
facilities, as the Owner may require, for the collecting and forwarding of samples and shall not use the materials represented by the samples until tests have been made. The Contractor shall furnish adequate samples without charge.

15.5 Concrete

15.5.1 All concrete materials, reinforcing steel, and preparation shall be in accordance with the requirements of the Standard Specifications for Public Works Construction, North Central Texas.

15.6 Vehicle Loop Detectors

15.6.1 Prior to termination of the shielded, twisted pair loop lead-in cables at the controller cabinet, insulation tests shall be made with an insulation test set applying not less than 500 volts D.C. to the completed loop detector. A minimum resistance of 1 megohm shall be obtained.

15.6.2 After the above insulation tests are completed and the lead-in cable has been terminated in the cabinet, the Contractor shall assist the Owner in determining the loop inductance of each loop detector installation. The Contractor shall furnish a loop detector analyzer which shall determine the total inductance of the loop in the pavement and the associated lead-in cable and shall also be used in determining the percentage shift in loop inductance for various size vehicles that may be actuating the detector.

15.7 Signal Cables

15.7.1 All cables shall be checked for insulation resistance upon installation and prior to termination. The tests shall be made with a test set operating at a minimum of 500 volts D.C. applied to the conductors.

15.7.2 Each conductor in the multiconductor signal cables shall be tested for insulation resistance relative to each other and to the outer covering of the cable. The following minimum acceptance values for insulation resistance shall be obtained:

No. 8 AWG, Type THW	592 Megohms/1000 Ft.
No. 12 AWG, Type THW	668 Megohms/1000 Ft.
12, No. 12 AWG Conductors	1018 Megohms/1000 Ft.
15, No. 12 AWG Conductors	1018 Megohms/1000 Ft.

20, No. 12 AWG Conductors 1141 Megohms/1000 Ft.
25, No. 12 AWG Conductors 1141 Mehohms/1000 Ft.

16.0 PAVEMENT MARKINGS

16.1 Submittals:

The Contractor shall submit certifications and obtain approval from the Owner of all pavement marking materials to be used on this project.

16.2 Product Delivery, Storage, and Handling:

Deliver materials in factory-sealed containers plainly marked with the following items: manufacturer's name and address, location of plant, material, color of material, amount of contents, and date of manufacturer and lot number.

16.3 Environmental Requirements:

16.3.1 Surface Preparation: Prior to application, clean pavement surface by brushing or sweeping to remove foreign matters, including dirt and other harmful materials.

16.3.2 Extruded thermoplastic compound:

16.3.2.1 Apply by extrusion of 400 deg. F minimum when air temperature is more than 35 deg. F and pavement temperature is above 45 deg. F or in accordance with manufacturer's recommendations..

16.3.2.2 If pavement is wet, delay application until the pavement has been exposed to at least two hours of direct sunlight after surface appears dry.

16.3.3 Reflective ceramic channel markers:

16.3.3.1 Apply on dry pavement when ambient temperature and temperature of pavement surface is above 60 deg. F.

16.3.3.2 If pavement is wet, delay application until the pavement has been exposed to at least two hours of direct sunlight after surface appears dry.

16.4 Extruded Thermoplastic Compound:

16.4.1 Properties

16.4.1.1 Water absorption: 0.5 percent maximum by weight or retained water when tested in accordance with ASTM D570.

16.4.1.2 Softening point: 90C minimum when tested in accordance with ASTM E.

16.4.1.3 Specific gravity: From 1.80 to 2.50 at 25C when tested in accordance with ASTM D792.

16.4.1.4 Low temperature stress resistance: No cracking or flaking, after 24 hours at 20 deg. C, when applied to asphalt surface.

16.4.1.5 Resistance to impact: Not less than 10 inches per pound at 77 deg. F using a 25 inch per pound scale, when tested in accordance with ASTM D256, Method A.

16.4.1.6 Bond strength: 150 psi minimum when tested in accordance with ASTM C321.

16.4.1.7 Drying time: Not exceeding straight line graphic established between two points representing two minutes at 50 deg. F and fifteen minutes at 90 deg. F respectively, when both ambient air temperatures are measured at maximum relative humidity of 70 percent.

16.4.1.8 Indentation Resistance Procedure:

Temperature of Compound	**Durometer Reading**
115 deg. F	**65**
77 deg. F	**95**
40 deg. F	**95**

16.4.2 Thermoplastic Compounds

16.4.2.1 Mixture of thermoplastic resins and other substances compounded for use in traffic markings which, when extruded hot in place and cooled to ambient temperature, will produce stark white or yellow reflective marking stripe.

16.4.2.2 Pigmented binder well dispersed and free from skins, dirt, foreign objects, or ingredients that will cause bleeding, staining, or discoloration and consisting of mixture of non-drying synthetic resins at least one of which is solid at room temperature.

16.4.2.3 Total binder content of thermoplastic compound: 15 percent minimum, 35 percent maximum by weight.

16.4.2.4 Filler incorporated with resins or binder: White calcium carbonate with compressive strength of 5,000 psi.

16.4.2.5 Permanently white or yellow, without blemish or discoloration, with straight, clean cut, sharply defined, parallel edges, and of uniform cross section.

16.4.2.6 Shaped to minimize tire impact and adhere permanently to road.

16.4.2.7 Set to solid, non-tacky, non-slippery line of sufficient elasticity to resist cracking and chipping caused by weather and temperature changes, traffic action, as well as pavement crawl, and lift in freezing weather.

16.4.2.8 After curing, does not react with nor deteriorate in contact with snow removal chemicals, oil and other substances common to roadway surfaces.

16.4.2.9 Chemically stable and emitting no dangerous fumes.

16.4.2.10 Especially compounded for traffic markings, with no change in color and brightness characteristics after prolonged exposure to sunlight.

16.4.2.11 No breakdown or deterioration when held at plastic temperature for extended periods of time nor when repeatedly reheated to plastic temperature.

16.4.2.12 No change in temperature versus viscosity characteristics through repeated reheatings and from batch to batch.

16.4.3 White thermoplastic compound:

16.4.3.1 Pure white, free from dirt or tint after drying.

16.4.3.2 Maximum allowable compound deviations from magnesium oxide standard when tested by standard color difference meter, Gardner Color Difference Meter, Gardner Laboratories, Inc., Bethesda, Maryland or equal, with the following minimum requirements:

Magnesium Oxide Scale	Definition	Standardized Sample
Rd	Reflectance	10070 minimum
a	Redness -	0-5 to +5
b	Yellowness-Blueness	0-10 to +10

16.4.3.3 The white compound pigment containing not less than six percent titanium dioxide (TIO2).

16.4.4 Yellow thermoplastic compound: After drying, yellow, FED STD 595, Color 33538, tested in accordance with Federal Test Method Standard 141, Method 4252.

16.4.5 Binder Sealer: Epoxy sealer, in accordance with manufacturer's recommendations.

16.5 Reflective Ceramic Channel Markers

16.5.1 Markers shall consist of a ceramic round base with a flat area on top (centered) and one acrylic rod lens reflector inserted in a protective ramp and adhered to a recess in the base. The marker shall provide brilliant wet and dry reflex-reflection when installed on roadway surfaces.

16.5.2 Roadmarker Materials:

16.5.2.1 Ceramic base shall be smooth self-cleaning vitrified ceramic with a white or colored semi-opaque glaze (fired at 2500° F). Ceramic base shall have an unglazed bottom surface.

16.5.2.2 Reflective lens shall be an acrylic rod reflector, 1-3/4" in length.

16.5.3 Ceramic base-round shape 4"• 1/8 x 3/4" high (approx.)

16.5.4 Ceramic base shall be white, yellow, or blue. Reflective lens shall be white, amber, or blue as appropriate.

16.5.5 Strength Requirements: A random sample of 5 buttons shall be subjected to the compressive load test. The average compressive strength of the 5 buttons shall not be less than 1500 pounds and no individual buttons shall have compressive strength less than 1200 pounds. The button shall be placed base down, over the open end of a vertically positioned hollow metal cylinder. The cylinder shall be one inch high, with an internal diameter of 3" and wall thickness of 1/4". A load necessary to break the bottom shall be applied at a speed of 0.2" per minute to the top of the button through a one-inch diameter solid metal cylinder centered on flat area on the top of the buttons. Should any of the samples tested for strength fail to comply with the specification, 10 additional samples will be tested. The failure of any one of these samples shall be cause for rejection of the entire lot of shipment represented by the samples.

17.0 PULL BOXES

17.1 The pull box cover shall be constructed of galvanized steel and its top surface shall have a minimum co-efficient of friction of 0.5.

17.2 The logo 'TRAFFIC SIGNALS" shall be imprinted as an integral part of all pull box covers.

17.3 All pull box covers shall be furnished with a brass locking mechanism to prevent access to the pull box without the use of tools.

17.4 All pull boxes shall be of a stackable design so that they can be joined together to achieve an extra-height box.

17.5 Pull box enclosures shall be constructed of concrete, and when covered, shall meet AASHTO standard specifications for H20 loading (32,000 pound, single axle load over a 10" x 10" are). Enclosures and covers shall be rated for a minimum of 15,000 lbs over a 10" x 10" area.

17.6 All pull box components shall be designed and tested to withstand temperatures as low as -20 degrees F.

17.7 Pull boxes designated as Type A on the plans shall be approximately 13"W x 19.5"L x 12"D. Pull boxes designated as Type C on the plans shall be approximately 15"W x 25"L x 12"D.

17.8 A one foot concrete apron shall be provided for all pull boxes not located in a sidewalk area as specified in the plans.

17.9 An 18 inch (minimum) thick base of 1/2" clean crushed rock shall be placed under each pull box installation.

17.10 A 1/2" diameter by eight foot cooper clad ground rod shall be placed in each pull box.

18.0 WARRANTIES/GUARANTEES

18.1 The Contractor guarantees all work performed and materials furnished under this project for a period of twelve (12) months following the date of acceptance. In addition, he shall furnish any normal manufacturer warranties with effective beginning dates the same as the date of final project acceptance.

19.0 TRAFFIC SIGNAL MAINTENANCE DURING CONSTRUCTION

19.1 While performing work under this contract, Contractor bears the sole rise of loss for damage to or destruction of any traffic signal equipment, appurtenances, on operations that were not to be replaced or installed under this contract but which are damaged or destroyed through the fault or negligent act of Contractor, and Contractor shall replace such damaged or destroyed equipment, etc., at no cost to the authority, regardless of whether or not the damaged or destroyed equipment, etc., was a part of this contract or any warranties under this contract. Upon written acceptance by the authority of a particular intersection of work, Contractor's responsibility for the intersection under this paragraph shall cease.

19.2 The Contractor shall provide, at his expense, temporary signal cable systems and signals mounted on the span wires, mast arms, portable bases, or other locations as necessary during the project to insure that signal head displays are always in operation. All such temporary signals shall be finished in appearance, meet the requirements of the Texas Manual on Uniform Traffic Control Devices (TMUTCD), and be approved by the Owner.

19.3 The Contractor's responsibility for full operation and maintenance of all traffic signal equipment shall begin when he starts any type of work which affects active intersection control at the first intersection and shall extend through the period of project final acceptance of each intersection. This maintenance responsibility includes existing controllers/masters, existing interconnect and cabling system existing signal hardware installed, new cabling controllers/masters, new signal hardware installed, new cabling system, and other hardware elements which are considered part of either the existing or new traffic signal system.

19.4 The Contractor shall utilize qualified personnel to respond to all trouble calls and to repair any malfunctions. A local telephone number (not subject to frequent changes) where trouble calls are to be received on a 24-hour basis shall be provided to the Owner by the Contractor. The Contractor's response to reported trouble calls shall be within a reasonable travel time from an Addison address, but not more than two (2) hours maximum. Appropriate repairs shall be made within 12 hours.

19.5 It is recognized that the Owner may continue to make a first response to any trouble call. Action on such response will, however, be limited to placing the intersection on flash, replacing load switches or detector amplifiers, erecting temporary control devices, requesting immediate traffic control by uniformed police officer, or other such action deemed necessary to provide a safe operation. Such action will in no way relieve the Contractor of his operation and maintenance responsibility.

19.6 The contractor shall be required to provide adequate police traffic control assistance for planned controller change-outs or any other operational procedures, when requested by the Engineer. Police assistance shall be arranged by the Contractor directly, at least twenty-four (24) hours in advance. If the Engineer discovers that the Contractor has failed to provide adequate police assistance, the Engineer may order additional assistance. Police traffic control assistance, for any purpose, shall be the financial responsibility of the Contractor, regardless of who obtains the assistance.

20.0 BARRICADES

20.1 The contractor shall comply with all the requirements of the TMUTCD.

20.2 The contractor shall have the responsibility to provide and maintain all warning devices and take all precautionary measures by law to protect persons and property while said persons on property are approaching, leaving, or within the work site of any area adjacent to said work site. No separate compensation will be paid to the Contractor for the installation or maintenance of any warning devices, barricades, lights, signs, or any other precautionary measure required by law for the protection of persons or property, including off duty police officers.

20.3 The Contractor shall assume all duties owed by the authority to the general public in connection with the general public's immediate approach to and travel through the work site and the area adjacent to said work site.

20.4 Where the work is carried on, in, or adjacent to, any street, alley, sidewalk, public right-of-way or public place, the Contractor shall at his own cost and expense, provide flagmen and watchmen and shall furnish, erect, and maintain such warning devices, barricades, lights, signs, and other precautionary measures which shall not cease until the project has been accepted by the governing Authority.

21.0 AS-BUILT DRAWINGS

21.1 The Owner shall furnish two (2) sets of construction Drawings to the Contractor at the time construction is commenced. These prints shall be marked-up by the Contractor

throughout the construction period, indicating all changes, revisions, and additions to the work, including field relocations of work concealed from view and conductor cable lengths. Upon completion of the work at each intersection, the Contractor shall deliver the As-Built drawings to the Owner within ten (10) working days after the turn-on/cut-over date.

22.0 MEASUREMENT AND PAYMENT

22.1 The traffic signal installation as indicated on the Plans and as described herein, when installed, will be measured as a completed installation and payment will be made at the contract unit bid price for "Traffic Signal(s)", which price shall be full compensation for furnishing, placing, and testing all materials and equipment and for all tools, labor, equipment, and incidentals necessary to complete the work. Portions of the work that have not been approved by Engineer will not be considered complete, and payment shall be withheld until the Contractor has corrected the work to the satisfaction of the Engineer.

23.0 EXPERIENCE AND QUALIFICATIONS

23.1 The low bidder shall be required to furnish the Engineer a written assessment of previous experience in the installation of traffic signal systems. The response shall include the name and population of the city or area served, Contract name and/or number, date of installed, date of Contract completion, Contract delays and discrepancies, liquidated damages and the name, address, and phone number of a specific individual representing the client who is in a position to verify such experience. The response shall be delivered to the Engineer within ten (10) working days after bid opening.

23.2 The Bidder shall also furnish information as required above for each major subcontractor (i.e., manufacturer or fabrication of traffic signal structures) that could be active in the project.

24.0 MISCELLANEOUS NOTES

24.1 The locations of driveways, sidewalks, drain gutters, etc., as shown on these plans are approximate. Accurate locations shall be determined by the Contractor at the time of construction.

24.2 The locations of traffic signal foundations, bases, conduit detectors, etc., shown on the plans are approximate. The Contractor shall give the governing traffic authority 48 hours notice of his intention to establish the final location of any foundations, bases, conduit, detectors, etc., and have the locations approved on the ground by the Owner or his duly authorized representative.

24.3 No trees shall be cut except upon the specific authority of the Engineer.

24.4 Where possible, dig under sidewalks. If the Contractor chooses to remove or cut the sidewalk, the concrete must be sawed and broken out and then restored to an equal or better condition than the original.

24.5 Removal of mail boxes in the way of construction requires 48 hours advance notice to the Post Office.

24.6 Pipelines, storm sewers, power cables, structures, and other underground items, both publicly and privately owned, exist adjacent to the construction limits of this project. The Contractor shall make his own investigation as to the location of these underground items and shall hold the authority exempt from any suits or claims resulting from damage by the Contractor's operations to any underground installation. The Contractor shall comply with all utility clearances.

24.7 All conduit runs shall be continuous of the same material (metal only or PVC only). Where tying into existing conduit, the Contractor must continue with the same material (metal to metal or PVC to PVC).

24.8 On all interconnect conduit runs, the Contractor shall install pull boxes at intervals of 250 feet to prevent damage or breakage to the cable being installed. Any increase or decrease in distance between pull boxes, unless shown on the plans, must be approved by the Owner or his duly authorized representative.

25.0 ACCEPTANCE NOTES

25.1 Prior to final acceptance by the Town of Addison:

1. A Texas Registered Professional Engineer shall certify that the project was constructed in accordance with the plans and specifications approved by the Town of Addison.

2. The owner shall provide 1 reproducible set of as-builts (sealed and certified by a Texas Registered Engineer) and 2 blue line sets.

25.2 Prior to starting construction, the Contractor shall contact the utility companies to locate existing facilities. These include but may not be limited to the following:

1. Town of Addison
2. Lone Star Gas
3. Southwestern Bell
4. Storer Cable
5. Planned Cable Systems
6. TU Electric

25.3 Prior to beginning construction, the owner or his authorized representative shall convene a pre-construction conference. Between the Town of Addison, Consulting Engineer, Contractors, Utility Companies and any other affected parties, notify Bruce Ellis 450-2847

at least 48 hours prior to the time of conference and 48 hours prior to beginning of construction.

25.4 Any existing pavement, curbs, and/or sidewalks damaged or removed will be repaired by the Contractor at their expense.

25.5 At intersections that have valley drainage, the crown of the intersecting streets will culminate in a distance of 40 feet from the intersecting curb line unless otherwise noted.

25.6 The Contractor shall obtain a right-of-way permit by the Town of Addison for working within the public right-of-way.

25.7 During construction, the owner shall provide a qualified Geotechnical Lab to perform materials testing during the construction, at the request of the Town of Addison.

25.8 The Contractor shall submit material sheets to the Town of Addison for approval prior to incorporating materials into the job.

23.9 The Contractor shall provide integration of the new controller data base and intersection/sub-system graphics into the Town of Addison's on Street Master Signal System.

SUPPLEMENTAL LANDSCAPE AND IRRIGATION SPECIFICATIONS

DEMOLITION

General

1. **Description:** Provide demolition, salvage and protection of existing structures and trees as shown on Drawings or specified.

2. **Related work specified elsewhere:**

   A. Tree Protection

   B. Earthwork

3. **Notification of Owners of Utility Lines and Equipment:** Notify any corporation, company, individual or local authority owning conduits, wires, pipes or equipment on site affected by Demolition work. Remove such items and pay fees or costs in conjunction. Cap lines in accordance with instructions of governing authorities. This is to include existing irrigation lines and related wiring.

4. **Protections:** Protect existing surfaces of building equipment or other materials scheduled to remain. Protect trees and other vegetation.

5. **Examination of Site:** Before submitting proposal, visit and examine site to ascertain actual nature and scope of demolition and salvage work. Claims for extra compensation on account of additional labor, materials or equipment required for difficulties encountered in demolition and salvage work will not be recognized.

Execution

1. **Demolition Operations:**

   A. Prior to demolition operations, disconnect and cap off irrigation and utility service lines not required for new construction in accordance with requirements of governing authorities, applicable ordinances and regulations. If Owner deems necessary, ball and burlap predetermined plant material and relocate to Owner approved site.

   B. Erect necessary barricades and protective measures as required. Verify that tree protection devices are in place.

   C. Execute demolition of surfaces in a careful and orderly manner with least possible disturbance or damage to adjoining surfaces.

   D. Materials and debris resulting from demolition operations will be removed from the site.

E. Remove pavements, structures, utilities, and the like to the depth of their structure.

F. Leave construction areas clean and ready for other trades.

G. Remove pavements sub-base to the depth of the base material.

H. Do not remove or damage trees or other vegetation unless noted to be removed.

Salvage: Salvage items discussed in preconstruction meeting. Clean and deliver to Town of Addison. If Owner deems necessary, have predetermined plant material professionally balled and burlapped by reputable and Owner approved company and relocated to Owner approved site. Here these items are to be professionally planted, staked, mulched, and deep-watered. A written Letter of Guarantee of one year shall accompany all such material.

Final Grading: Refer to Earthwork for final grading requirements.

End of Section

EARTHWORK

General

1. **Description:** Provide complete topsoil stripping and stockpiling, earth excavation, filling, grading, trenching, and backfilling.

2. **Related Work Specified Elsewhere:**

   A. Tree Protection

   B. Lawns

   C. Landscaping

3. **Submittals:** Submit adequate samples of each proposed backfill to the site for Owner's review and approval.

4. **Job Conditions:**

   A. Protections:

      1. Protect reference points, bench marks and monuments from damage or discoloration. Replace or repair immediately points damaged, destroyed or dislocated.

      2. Protect and maintain conduits, drains, inlets, sewers, pipes and wires that remain on property.

      3. Do not leave temporary wood in concrete or fill.

      4. Cover holes and trenches when work is not in progress. Fence or barricade changes of plane more than 45 degrees horizontally and more than 3 feet vertically.

      5. Provide dewatering and drainage to keep excavations free of water.

      6. Protect adjacent surfaces and improvements outside grading limits. Repair any damage immediately.

   B. Coordination: If applicable, coordinate backfill operations with installation of subsurface drainage systems.

   C. Soil Classification: Excavated materials are not classified as to type. Excavation

includes all material encountered at site including rock rubble and debris.

Materials

1. **Select Fill:** Cohesive fill with liquid limit of less than 35 percent and plasticity index ranging from 5 to 15. Select fill shall be free of any lumps or stones larger than 1½ inches diameter.

2. **Imported Topsoil:**

   A. Friable, dark loamy soil, fertile, free from rubble, stones, clay lumps, extraneous material, plant roots and reasonably free of weeds. Topsoil containing Nutgrass or Dallisgrass will be rejected.

   B. Physical properties as follows:

   Clay - Between 7 - 27 percent.
   Silt - Between 28 - 50 percent.
   Sand - Less than 52 percent.

3. **Site Topsoil:**

   A. Suitable topsoil material is excavated from on site.

   B. Suitable soil is defined as dark brown sandy clay loam or dark brown blackland topsoil free of rocks greater than 1" in diameter, weeds, roots and other objectional materials. Suitable soil will be determined by the Architect/Owner.

4. **Subsoil Material:** Soil excavated from construction areas free of rocks (larger than 2½ inches) and construction debris.

5. **Stock Piles:** Topsoil and excess subsoil material cut from construction areas which is suitable for backfilling shall be stockpiled in separate piles as directed by Architect/Owner. Location of stock piles shall be subject to approval of Owner.

6. **Surplus Materials:** Remove from site any excess materials and excavated materials unsuitable for use as fill and backfill. Materials containing rubbish or debris shall be immediately removed and legally disposed of off-site.

Execution

1. **Preparation:**

   A. Remove abandoned, inactive utilities to point not less than 3 feet below finish grade. Plug or cap remaining lines in manner acceptable to utility company.

B. Report encounter of active utilities not indicated by the Contract Documents to Architect/Owner. Disposition shall be as directed with adjustment in Contract amount. Extra payment will not be authorized for work that could have been foreseen by careful examination of site.

C. Notify respective utility companies of damage caused to active utilities and protect active utilities pending instruction for disposition.

D. Strip and stockpile site topsoil and subsoil material for future use.

E. If applicable, verify that drainage system is complete.

F. Verify that waterproofing is complete.

2. Backfilling/Filling:

A. General:

1. Before filling, clean area debris, large rocks, formwork and loose material. Area to be filled shall be approved by Architect/Owner before filling is started.

2. Prior to filling under pavements proof-roll subgrade with a rubber tired roller of sufficient weight. Weak areas or areas where excessive pumping is noted shall be removed and replaced with Select Fill. Once the subgrade is uniformly stable, compact the area as noted herein.

3. Brace retaining walls and grade beams while placing fill or backfill material.

B. Select Fill:

1. Place under pavements in a uniform thickness.

2. Place in maximum 8" lifts compacted to approximately 90% of Standard Proctory density at ±3% of optimum moisture content.

C. Backfill - Site:

1. Prior to placing backfill, scarify surface of ground to a depth of 4 inches. Moisture content of loosened material shall be such that first layer of fill will readily bond to surface. Do not place fill on subgrade that is muddy, frozen or contains frost.

2. Place in 8 inch maximum lifts and compact to approximately 85 percent of

Standard Proctor density.

D. Backfill - Under Pavements: Follow procedures noted in C. above, except compact lifts to 90% of Standard Proctor density.

3. **Finish Grading:**

A. Grade uniformly with rounded surfaces at tops and bottoms of abrupt changes in plane. Hand-grade steep slopes and areas that are inaccessible for machine work and areas around existing trees. DO NOT cut or fill around trees unless approved by the Architect and Owner.

B. Protect graded areas from undue erosion. Repair and regrade if required. Refill and compact where settlement occurs.

C. Grade areas to elevations and slopes indicated without depressions causing pocketing of surface water or humps, producing localized runoff and gullying. Ponding of water on-site is not allowed. Finish surfaces to be not more than 0.10 foot above or below established grade as follows:

1. Lawn Areas - Provide a minimum of 6" of Imported Topsoil or Site Topsoil over the lawn. If rock is encountered, overexcavate to a dept the one (1) foot and backfill with Topsoil.

2. In areas where fill will exceed 6" (except where Select Fill is called for), place Imported Topsoil or Site Topsoil to a minimum depth of two (2) feet. If more than two (2) feet of fill is required, Subsoil Material may be used to within two (2) feet of finish grade.

3. Planting Beds - Grade these areas to a subgrade of 6" below finish grade. Complete final backfill with prepared soil mix as provided in the landscaping section.

4. **Cleanup:** Remove excess materials from site promptly to prevent large accumulations. Store reusable material neatly in designated locations. Upon completion of the project any remaining surplus materials must be removed and legally disposed of off site.

End of Section

TREE PROTECTION

General

1. **Description:** Provide protection of existing trees scheduled to remain.

2. **Site Conditions:** Existing trees are to be field located and displayed on the drawings.

3. **Protection:** Protect trees by barricading each tree within ten feet of construction.

4. **Guarantee:** Guarantee existing trees against damage until final acceptance of the project. Repair any damage which, in the opinion of the Owner, can be satisfactorily corrected.

5. **Definitions:**

   A. Disturbance/Damage: Physical or visual change to the trees which, in the opinion of the Owner, is detrimental to the trees being protected. Such disturbance may be caused by equipment, material or personnel.

   B. Violation: Damage to trees caused by any construction or delivery vehicle, construction material storage, or disposal of solid or liquid debris shall be considered a violation. The Contractor's representative will report the observed violation to the Owner verbally, if possible, and in writing within 7 days of a violation. The written notice shall include the date, the approximate time, the general location and type of violation.

Execution

1. **Tree Protection:**

   A. Barricading fencing material shall be Plastic Snow fence with 6 foot tall steel T post.

   B. Install prior to any mobilization on the site.

   C. Barricade: Install barricades around trees eight (8) feet and farther from construction. Place barricades at drip line or as directed by the Owner.

2. **Maintenance:** Maintain tree protection in a newly installed condition through final acceptance.

3. **Penalty:** If any tree is damaged and in the opinion of the Owner cannot be satisfactorily repaired, then a fine of $100 per caliper inch will be assessed against the Contractor.

Caliper measurements will be taken as follows: Up to and including 4" caliper will be measured 6" above ground level; and calipers over 4" will be measured 4' above ground level.

End of Section

IRRIGATION SYSTEM

General

1. **Description:** Provide complete landscape irrigation system as shown on Drawings and described herein.

2. **Related Work Specified Elsewhere:**

   A. Landscaping

   B. Lawns and Grasses

3. **Quality Assurance:**

   A. Materials:

      1. Procedure: Comply with the Town of Addison's specifications.

      2. Time: To be considered, submit substitution request in writing 7 days prior to bid opening.

      3. Required Submittal Material:

         a. Sample proposed sprinkler.
         b. Manufacturer's data of sprinkler, discharge rates (GPM), minimum allowable operating pressure, maximum allowable spacing and distance of throw.
         c. Detailed pressure loss computations for following zones: largest demand and fartherest from sources(s).
         d. If proposed substitute requires a change in head and piping layout as designed, submit detailed drawings showing design changes and proposed layout.

      4. Approval: Approval of proposed substitute will not relieve responsibility for providing a system that will operate according to intent of originally designed system.

   B. Contractor: System installation must be supervised by Licensed Irrigator, licensed by the State of Texas, and who has performed with a minimum of 5 continuous years of experience installing systems of this size and complexity.

   C. Assembly Procedures: Do not alter design hydraulics by installing additional tees or elbows unless approved by Architect/Owner.

D. Testing: Perform required testing under observation of Architect and/or Owner. Give 24 hours notice that such tests are to be conducted.

E. Handling of PVC Pipe and Fittings: Exercise care in handling, loading, unloading, and storing of PVC pipe and fittings. Transport PVC pipe in a vehicle which allows the length of pipe to lie flat so as not to subject it to undue bending or concentrated external load at any point. Any section of pipe that has been dented or damaged and, if installed, shall be replaced with new piping.

4. Referenced Standards:

American Society for Testing and Materials (ASTM, latest edition)

ASTM - D2241 Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR)
ASTM - D2287 Flexible Poly (Vinyl Chloride) (PVC) tubing
ASTM - D2464 Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
ASTM - D2466 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
ASTM - D2564 Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
ASTM - D2855 Standard Recommended Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.

5. Submittals:

A. Product Data: Submit copies of manufacturer's specifications and literature.

B. Water Pressure: Prior to starting construction, determine static water pressure. Confirm findings to Architect/Owner in writing.

C. Project Record Documents:

1. Locate by written dimensions, routing of mainline piping, remort control valves, gate valves, water meters, quick coupling valves, and other related equipment as directed by the Architect/Owner. Located mainlines by single dimensions from permanent site features provided they run parallel to these elements. Locate valves, intermediate electrical connections, if approved, and quick couplers by two dimensions at 90 degrees to each other provided they are within 20 feet of a permanent site feature. Valves, electrical connections and quick couplers beyond 20 feet must be located by triangulation using three dimensions from building corners, walk intersections or similar junctures.

2. When dimensioning is complete, transpose work to mylar reproducible tracings. Tracings will be provided by Architect/Owner. Mark tracings "Record Prints".

Date and sign Drawings.

3. Submit completed tracings to Architect/Owner prior to final acceptance.

4. Controller Charts:

   a. After as-builts drawings have been submitted and approved, complete one controller chart for each controller supplied.
   b. The chart shall show the area controlled by the automatic controller and shall be the maximum size which the controller door will allow.
   c. The chart is to be a reduced drawing of the actual as-built system. However, in the event the controller sequence is not legible when the drawing is reduced, it shall be enlarged to a size that will be readable when reduced.
   d. The chart shall be a black line or blue line ozalid print and a different color shall be used to indicate the area of coverage of each station.
   e. When completed and approved, the chart shall be hermetically sealed between two pieces of plastic, each piece being a minimum 10 mils.

5. Operation and Maintenance Manuals Data:

   a. Provide 3 manuals neatly bound in a hard back three ring binder.
   b. Index sheet stating Contractor's address and telephone number, list of equipment with name and addresses of local manufacturer's representative.
   c. Catalog and parts sheets on every material and equipment installed under this contract.
   d. A Letter of Guarantee for a period one (1) year from date of acceptance.
   e. Complete operating and maintenance instruction on all major equipment.

D. Equipment to be Furnished:

1. Two (2) sets of special tools required for removing, disassembling and adjusting each type of sprinkler and valve supplied on this project.
2. Two (2) keys for each automatic controller.
3. One (1) quite coupler key with swivel attached for every three (3) or fraction thereof of quick coupling valves installed.
4. Provide equipment at the conclusion of the project prior to final review.

6. Coordination:

A. Coordinate water meter installation with local water department.

B. Sleeves under paving and routed through walls to be installed by Contractor. Verify locations and include on as-builts.

C. Coordinate installation of irrigation system with work of other trades. Coordinate with Landscape Contractor to ensure plant material is uniformly watered in accordance with intent.

D. Coordinate to ensure that electrical power source is in place. Electrical service is the responsibility of the Contractor and must conform to national code standards.

7. **Warranty and Maintenance:**

A. Fully warranty materials and workmanship for one year after final acceptance.

B. Provide maintenance of system, including cleaning and adjustment of heads, raising and lowering of heads to compensate for settling, for one year after acceptance.

C. Limit warranty to repair and replacement of defective materials and workmanship; and repair of backfill settlement.

D. Extend to Owner any warranties and guarantees provided by manufacturer to Contractor of equipment provided. Manufacturer's warranties shall not relieve the Contractor of his liability under the guarantee. Such warranties shall only supplement the guarantee.

E. Duplicate the following warranty statement and submit it bound within the Operation and Maintenance manuals.

GUARANTEE FOR SPRINKLER IRRIGATION SYSTEM

We hereby guarantee that the sprinkler irrigation system we have furnished and installed is free from defects in materials and workmanship, and the work has been completed in accordance with the drawings and specifications, ordinary wear and tear and unusual abuse, or neglect excepted. We agree to repair or replace any defects in material or workmanship which may develop during the period of one year from date of acceptance and also to repair or replace any damage resulting from the repairing or replacing of such defects at no additional cost to the Owner. We shall make such repairs or replacements within three (3) days time after receipt of written notice from the Owner, we authorize the Owner to proceed to have said repairs or replacements made at our expense and we will pay the costs and charges therefore upon demand.

PROJECT: _____

LOCATION: _____

_____ SIGNED: _____

ADDRESS: _____

_____

PHONE: _____

DATE OF ACCEPTANCE: _____

Products

1. **Definitions:**

   A. Mainline: Piping from ter source to operating valves. Pipe leading to quick coupling valves (QCV) is considered mainline.

   B. Lateral: Piping from remote control valves to irrigation heads.

2. **Polyvinyl Chloride Pipe Materials:**

   A. Polyvinyl chloride Pipe (PVC): Manufactured in accordance with standards noted below.

      1. Marking and Identifications: Permanently marked with SDR number, schedule, ASTM standard number, and the NSF (National Sanitation Foundation) seal. Provide pipe free of blisters, internal striations, cracks, or other defects.

      2. PVC Pipe and Fittings: Schedule 40, NO EXCEPTIONS.

   B. Flexible PVC Pipe: As manufactured by Spears, Inc., from virgin PVC material and tested at 200 psi static pressure for two hours with a guide burst rating of 400 psi min.

   C. PVC Pipe Connection Materials:

      1. For slip fittings, use primer and adhesive solvent. Cans of primers and solvents to have labels intact and stamped with date of manufacture. Cans dated over two years old will not be permitted. Thinning of primer or solvent will not be permitted.

      2. For threaded fittings, PVC to PVC, or PVC to copper, use Teflon paste.

      3. For flexible PVC, use only solvents made for flexible pipe, such as, IPS-795 solvent.

3. **Copper Pipe Materials:**

A. Copper Tubing: Hard, straight lengths of Type "M" only. Provide pipe free of internal striations, cracks, or other defects. Copper tube of foreign extrusion or irrigation tubing (thin wall) will be rejected.

B. Copper Tube Fittings: Cast brass or wrought copper, seat-solder type.

C. Pipe Connection Materials: Threaded fittings, copper to copper, copper to brass, copper to PVC: Teflon paste.

4. **Miscellaneous Materials;**

A. Wire: Type UF with 4/64 inches insulation, Underwriters laboratory (UL) approved for direct underground burial in National Electrical Code Class II Circuit (30 volts AC or less). Size according to controller manufacturer's recommendations and consideration of length of run, but no smaller than #14.

B. Nipples:

1. Nipples for lawn and shrub heads: Threaded polyethylene, nominal 1/2 inch by 6 inches.

2. Nipples for swing joints: Schedule 80 PVC, Type 1, Grade 1. Utilize Marlex elbow at point of connection to rotary or impact head.

C. Washed Pea Gravel: Graded ¾ - 1½".

5. **Material List:**

Manufacturer	Model No.	Description
Toro	570C-4P	4" pop-up lawn head
	570S	Shrub head on copper riser
	570C-12P	12" pop-up shrub head
Hunter	PGP	Rotary head
Weathermatic	11024-FCR	Contamination resistant electric valve
Irri-Trol	MC Plus Series	Automatic Controller with pedestal where required
Buckner	30A	Quick coupler valve
Spears		Ball valve (Female Thread)
Miniclick		Temperature sensor (1 required for each controller)
Buckner	30AC & 20	¾" Coupler key & swivel
Ametek, DFW, Carson Industries or approved equal		Plastic Valve boxes with locking covers and extensions as required

Execution

1. **Inspection:**

   A. Examine areas and conditions under which irrigation sprinkler system is to be installed.

   B. Verify existing sleeves installed by others.

   C. Notify Architect/Owner in writing of conditions detrimental to proper and timely completion of Work. Do not proceed until conditions are satisfactory.

   D. Exercise extreme care in excavating and working near existing utilities. Contractor shall be responsible for damages to utilities which are caused by his operations or neglect. The Contractor shall arrange to have all utilities located prior to beginning any work.

2. **Installation:** Follow Town of Addison's Irrigation Specifications in conjunction with the following guidelines.

   A. General:

      1. Compliance: Complete installation in strict accordance with manufacturer's recommendations which shall be considered part of these specifications.

      2. Staking: Stake location of each head for approval of Architect/Owner before proceeding. Do not exceed manufacturer's maximum spacing limits.

      3. Piping Layout: Piping layout is diagrammatic. Route piping around trees and shrubs to avoid damage to plantings. Do not dig within balls of newly planted trees and shrubs.

      4. Discrepancies:
         a. Point out any discrepancy between Drawings and field conditions that may affect uniform coverage. Do not proceed until any design change made necessary by such discrepancy is approved.
         b. Should changes create extra cost, approval for extra compensation shall be obtained in writing before commencing work.
         c. Should change create a cost savings, a written reduction in contract price must be approved in writing before commencing work.

   B. Excavations: Excavations are unclassified and include earth, loose rock, or combination, in wet or dry state. Backfill trenches with material, as per Addison's specifications. Ensure a minimum of 6 inches of rock-free soil surrounding pipe.

C. Water Tap: The Owner will provide water taps in approximate locations noted on the drawings. Coordinate tap installation so as not to delay system installation.

D. Water Meter and Backflow Prevention:

1. Install type and size indicated on Drawings and in materials list per Town's specifications.

2. Install in meter box per local codes and Town's specifications.

3. Install 1.0 cu. ft. washed pea gravel in bottom of box.

E. Pipe Installation:

1. Mainline and Lateral Piping: Install in 4 inch wide trenches with minimum of 12 inches of cover over pipe, but no more than 18 inches of cover.

2. Trenching: Provide firm, uniform bearing for entire length of pipe to prevent uneven settlement. Wedging or blocking of pipe is not permitted. Remove foreign matter from inside of pipes before welding. Keep inside of piping clean during and after layout of pipes.

3. Backfill: Hand-tamp and water-jet to prevent settling. Hand rake trenches and adjoining areas to leave grade in condition equal to before installation.

F. PVC Pipe and Fittings Assembly:

1. General: Remove extraneous material including burrs from inside and outside edges of new cuts.

2. Primer: Follow manufacturer's procedures for use.

3. Solvent: Follow manufacturer's procedures to make solvent-welded joints.

4. Threaded Joints: Use Teflon-paste.

G. Copper Pipe and Fittings Assembly:

1. Clean pipe and fittings thoroughly and buff connections with wire brush to remove residue from pipe.

2. Flux pipe and fitting and solder connection using 50-50 soft solid core solder.

H. Remote Control Valves and Gate Valves:

1. Provide type in accordance with materials list from Town's specifications and size according to Drawings.

2. Provide valves in an level position in accordance with manufacturer's specifications.

3. Install valves in rectangular plastic valve box, centered over valve, ¼ inch above finish grade. Provide valve box extensions as required.

4. Provide 0.5 c. ft. washed pea gravel in bottom of valve box.

I. Heads:

1. General: Provide in accordance with materials list, with nozzling as shown on Drawings. Change nozzle degree and trajectory if wind conditions affect coverage. Notify Architect/Owner of changes. Install heads adjacent to walks and curbs 2 inches clear of paving to allow for edging equipment.

2. Shrub Heads: Provide spray nozzles on copper tube risers attached to lateral piping with Poly nipples, sufficiently high to water over plantings and plants when they have reached their ultimate growth, or as directed by Architect/Owner. Firmly tamp soil around copper riser and leave plumb.

3. Lawn Heads: Attach heads to lateral piping with polyethylene nipples. Firmly tamp soil around base plate and leave head plumb.

4. High-Pops: Attach to lateral piping with polyethylene nipple. Use bottom connection only unless otherwise directed by Architect/Owner. Provide strainer in each head. If conditions warrant, funny pipe installations are permissible with Owner approval.

5. Rotary Heads: Install on swing joints using Schedule 80 nipples, threaded fittings and a Marlex elbow at point of head connections. Polyethylene nipples are allowed in areas not to be tractor mowed.

J. Quick Coupling Valves (QVC): Provide in accordance with materials list and install on swing joints using Schedule 80 nipples.

K. Wiring:

1. Provide wire from controller to remote control valves. Conduit is not required for U.F. wire, unless otherwise noted.. Tuck wire under mainline piping.

2. Make wire connections with direct burial King splices according to

manufacturer's installation procedures.

3. Provide a separate lead wire with red insulation from controller to each remote control valve. Provide a common neutral wire with white insulation from controller to valves served by a particular controller.

4. Provide 24 inch long expansion coil for each wire at valves and a 6 inch expansion loop at places of directional change.

L. Controller:

1. Provide according to Owner's recommendations.

2. Locate with approval of Owner. Mount on wall or pedestal, as determined by Owner.

3. Breaker box with 115V power supply will be supplied to controller by other trades. Complete connection in rigid metal conduit in accordance with applicable electrical codes using watertight fittings.

4. If approved, securely fasten conduit permanently to wall in manner appropriate for wall material.

5. Connect one valve per zone. Sequence zones in logical progression.

M. Temperature Sensor: Provide securely mounted on bottom of controller.

3. **Testing:** Test laterals and mains for a period of one hour in the presence of the Architect/Owner. If leaks or pressure drops occur, correct defect and repeat test.

4. **Final Adjustment:**

A. Make final adjustments of irrigation system prior to Architect/Owner final inspection.

B. Flush system by removing nozzles from heads on ends of lines and operating system.

C. If needed, adjust each section for operating pressure and balance to other sections by use of flow adjustment on top of each valve.

D. Adjust nozzling for proper operation, alignment and coverage. Prevailing wind conditions or slopes may indicate that arc of angle or trajectory of spray should be other than as shown on Drawings. Change nozzles to provide correct coverage.

Notify Architect/Owner of changes.

E. Carefully check zones verifying plantings are uniformly watered.

5. **Cleanup:** Keep site clean of unused materials and debris. Leave site in broom clean condition daily.

End of Section

LANDSCAPING

General

1. **Description:** Provide complete landscaping as specified and described herein.

2. **Related Work Specified Elsewhere:**

   A. Irrigation System

   B. Lawns and Grasses

   C. Earthwork

3. **Quality Assurance:**

   A. Comply with applicable Federal, State, County, and Town regulations governing landscape materials and work.

   B. Architect/Owner reserves the right to review materials at growing site.

   C. Observation at growing site does not preclude right of rejection at job site. Plants damaged in transit or at job site shall be rejected.

   D. Personnel: Employ only qualified personnel familiar with required work.

4. **Referenced Standards:**

   A. American Standard for Nursery Stock, Edition approved May 2, 1986 by American National Standards Institute, Inc. (Z60.1 - 1990) - plant materials.

   B. Hortus Third, 1976 - Cornell University - plant nomenclature.

   C. ASTM: American Standard Testing Material - sharp sand

5. **Submittals:**

   A. Samples: Provide representative quantities of sandy loam, sharp sand, bark mulch, soil amendment, and soil saver. Samples shall be approved by Architect/Owner before use on project.

   B. Submit three representative samples of each variety of ornamental trees, shrubs, and groundcover plants for Architect/Owner approval. When approved, tag, install and maintain as representative samples for final installed plant materials.

C. File Certificates of Inspection of plant material by State, County and Federal authorities with Architect/Owner, if required.

6. Product Delivery, Storage and Handling:

A. Preparation:

1. Balled and Burlapped (B&B) Plants: Dig and prepare shipment in a manner that will not damage roots, branches, shape, and future development. Allow to properly cure prior to transporting.

2. Container Grown Plants: Deliver plants in container sufficiently rigid to hold ball shape and protect root mass.

B. Delivery:

1. Deliver packaged materials in sealed containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery and while stored at site.

2. Deliver only plant materials that can be planted in one day unless adequate storage and watering facilities are available on job site.

3. Protect root balls by heeling in with saw dust if not planted within 24 hours of delivery.

4. Protect during delivery to prevent damage to root ball or desiccation of leaves. Keep plants moist at all times. Cover all materials during transport.

5. Notify Architect/Owner of delivery schedule 48 hours in advance so plant material may be observed upon arrival at job site.

6. Remove rejected plant material immediately from site.

7. Do not lift, move, adjust to plumb, or otherwise manipulate plants by trunk or stems to avoid damage or stress.

7. Job Conditions:

A. Planting Restrictions:

Perform actual planting only when weather and soil conditions are suitable in accordance with locally accepted practice.

B. Protection:

1. Do not move equipment over existing or newly placed structures without approval of Architect/Owner.

2. Provide board-roading as required to protect paving.

3. Protect other improvements from damage, with protection boards, ramps and protective sheeting.

C. Utilities:

1. Determine locations of underground utilities and perform work in a manner which will avoid possible damage. Hand excavate, if required, to minimize possibility of damage to underground utilities.

2. Coordinate work with irrigation contractor to prevent damage to underground sprinkler system.

D. Grades: Refer to Earthwork section for planting bed depths.

8. Warranty:

A. Warranty plants and trees for one year after final acceptance. Replace dead materials and materials not in vigorous, thriving condition as soon as weather permits and on notification by Architect/Owner. Replace plants, including trees, which in opinion of Architect/Owner have partially died thereby damaging shape, size, or symmetry.

B. Replace plants and trees with same kind and size as originally planted, at no cost to Owner. Provide one year warranty on replacement plants. Trees should be replaced at start of next planting or digging season. In such cases, remove dead trees immediately. Protect irrigation system and other piping conduit or other work during replacement. Repair any damage immediately.

C. Warranty excludes replacement of plants after final acceptance because of injury by storm, drought, drowning, hail, freeze, insects or diseases.

D. At end of warranty period, staking and guying materials shall be removed from the site by the Contractor at no additional costs.

9. Maintenance:

A. Water: Will be available on site. Provide necessary hoses and other watering equipment required to complete work.

B. Maintain plantings and trees by watering, cultivating, weeding, spraying, cleaning

and replacing as necessary to keep landscape in a vigorous, healthy condition and rake bed areas as required until final acceptance.

C. Coordinate watering schedules with irrigation contractor during installation and until final acceptance. Provide supplemental deep root watering to newly installed trees.

Products

1. **Plants:**

A. General: Equal to well-formed No. 1 grade nursery stock. Listed plant heights are from tops of root balls to nominal tops of plants.

B. Shrubs and Ground Covers: Nursery grown, healthy, vigorous, of normal habit of growth for species, free from disease, insect eggs and larvae. Specified sizes are before pruning and measured with branches in normal position. Plants shall be well rooted and established in the container.

C. Ornamental and Shade Trees: Healthy, vigorous, full-branched, well-shaped, symmetrical, trunk diameter and height requirements as specified. Balls shall be firm, neat, slightly tapered and well-burlapped. Trees with loose or broken balls at time of planting shall be rejected. Trees will be individually approved by Architect/Owner. Root balls shall be 9 inches in diameter for each inch caliper, measured 6 inches above root ball for up to 3 inch caliper, and 12 inches above root ball for trees larger than 3 inch caliper. Trees shall be free of scrapes, bark abrasions, split branches, mistletoe or other parasitic growth.

2. **Soil Preparation Materials:**

A. Sandy Loam:

1. Friable, fertile, dark, loamy soil, free of clay lumps, subsoil, stones, and other extraneous material and reasonably free of weeds and foreign grasses. Loam containing Dallisgrass or Nutgrass shall be rejected.

2. Physical properties as follows:
   Clay - between 7 - 27 percent
   Silt - between 15 - 35 percent
   Sand - less than 52 percent

3. Organic matter shall be 4-12% of total dry weight.

B. Sharp Sand: Clean, washed sand, (fine aggregate) ASTM C-33.

C. Organic Soil Amendment: Commercial grade decomposed compost similar to Back-To-Earth products.

D. Commercial Fertilizer: 10-20-10 or similar analysis. Nitrogen source to be a minimum 50% slow release organic Nitrogen (SCU or UF) with minimum 8% sulphur and 4% iron, plus micronutrients.

3. **Miscellaneous Materials:**

A. Steel Edging: ⅛" x 4" Ryerson or approved equal.

B. Mulch: Shredded hardwood bark.

C. Guying materials for Trees:

1. Wire: 12 gauge, single strand, galvanized wire.

2. Rubber hose: 2 ply, fiber reinforced hose, minimum ½ inch inside diameter. Color: Black

D. Soil Saver: Jute mesh, 4 foot wide rolls.

E. Wrapping Material: Waterproof crepe tree wrapping paper.

Execution

1. **Inspection:** Examine subgrade upon which work is to be performed and verify conditions under which work is to be performed. Notify Architect/Owner of unsatisfactory conditions. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Owner.

2. **Tree Planting:**

A. Stake tree locations for approval by Owner.

B. Tree Pit Excavation: Excavated soil may be used for backfill provided it is approved by Owner. Backfill must be free of subsoils, rock, caliche, and other extraneous material. If backfill is not acceptable, use sandy loam.

C. Shade Trees:

1. Plant in pits 2 foot greater in diameter than root balls.

2. Backfill to depths of root with 5 parts excavated soil or sandy loam and 1 part organic amendment. Remove excess excavated soil from site.

Carefully settle by watering to prevent air pockets.

3. Note that tree uplights may be installed adjacent to trees. Take care not to disturb units or conduit.

4. Coordinate required depth with Owner in areas of paver installation. Remove any twine around trunks of B & B plant material and cut off the top ⅓ of any wire baskets.

D. Ornamental Trees:

1. Plant in pits 12 inches greater in diameter than tree ball, backfill with 5 parts excavated soil or sandy loam and 1 part organic amendment. Remove excess excavated soil from site. Carefully settle by watering to prevent air pockets.

2. Determine direction of staking and rotate plants in pit to take advantage of optimum stem orientation. Remove any twine around trunks of B & B plant material and cut off the top ⅓ of any wire baskets.

3. **Tree Saucers:** Form a 4 inch high saucer around each new tree including ornamentals for deep watering. Contractor is responsible for deep watering until final acceptance.

4. **Tree Guying:**

A. Guy trees immediately following planting operation. Take precautions during guying operation to prevent damage or injury to branches. Orient guy wires within each cluster or row of trees in same direction

B. Utilize 6 foot T-post and drive into ground sufficient depth to assure rigidity. Loop wire through hose and route both around crotch of major branch. Securely fasten loose ends at T-post by twisting together. Tighten wires to taught condition by inserting screw driver between wires at midpoint and rotating. Allow no wire to rub against branches or trunk.

5. **Pruning of New Trees:** Prune trees to preserve natural character of plant in a manner appropriate to its particular requirements in the landscape design as directed by Architect/Owner. In general, never remove greater than one-third of wood by thinning. Do not cut back terminal branches. Remove sucker growth and broken or badly bruised branches. Thin field collected trees heavier than nursery grown plants.

6. **Tree Wrapping:** Wrap nursery grown trees. Extend wrapping from ground to a point immediately below lowest branch of each tree or as directed. Securely fasten in place with tacks or staples, so wrapping will remain in place 2 years.

7. **Steel Edging:** Provide steel edging at interface of planted areas and lawn areas unless indicated otherwise. Set edging as indicated in true lines as designed with top of edging two (2) inches above finish grade on lawn side.

8. **Prepared Soil:** Provide six (6) inches of thoroughly mixed prepared soil for shrubs, ground cover and seasonal color as follows:

   1 part sandy loam
   1 part peat moss
   1 part sharp sand
   Add 4 pound commercial fertilizer per 100 SF of bed area and mix thoroughly.

   Rotor till to a minimum depth of 6"-8".

9. **Shrub and Groundcover Planting:** Place plants in position on bed areas before cans have been removed. Obtain approval from Architect/Owner. Architect/Owner reserves the rights to interchange or shift locations of plants prior to planting. Do not remove burlap from B & B plants. Plant where located, setting plants with tops of balls even with tops of beds and compact soil carefully around each plant ball. Water thoroughly to eliminate air pockets. Carefully prune plants to remove dead or broken branches and hand-rake bed areas to smooth even surfaces.

10. **Pocket Planting:**

    A. Plants having a spacing of 3 feet on center or greater can be pocket planted. Excavate pit 12 inches larger than diameter of container. Backfill with prepared soil.

    B. Remove all vegetative growth including root systems from unexcavated areas between plant pits. Cultivate to a depth of six (6) inches. Rake smooth.

    C. Top dress entire area as specified.

11. **Jute Mesh:** Install soil saver on slopes greater than 3:1 ratio in accordance with manufacturer's directions.

12. **Top Dressing:** After planting has been completed and approved by Architect/Owner, top dress bed areas with shredded hardwood bark mulch to a minimum of 2 inches deep. Delay this operation until near final acceptance.

13. **Cleanup:** Keep premises neat and orderly including organization of storage areas. Remove trash and debris from excavated planting areas, preparing beds, or planting plants from site daily as work progresses. Keep paved areas clean by sweeping or hosing.

LAWNS AND GRASSES

General

1. **Description:** Provide topsoil, fine grading, fertilizer, sodding and hydromulching of either Bermuda grass or Ryegrass followed by a subsequent Bermuda application. Grass varieties are to preapproved by Owner.

2. **Related Work Specified Elsewhere:**

   A. Irrigation System

   B. Landscaping

   C. Earthwork

3. **Product Delivery, Storage and Handling:**

   A. Deliver fertilizer, as specified, to site in original, sealed containers bearing manufacturer's guaranteed statement of analysis.

   B. Store fertilizer in weatherproof location.

4. **Quality Assurance:**

   A. Water: Water will be available on site. Provide necessary hoses and other watering equipment required to complete work.

   B. Maintenance: Until final acceptance and until an approved stand of grass is achieved, maintain plantings by watering, cultivating, mowing, weeding, spraying, cleaning and replacing as necessary to keep plants in a vigorous, healthy condition.

      1. Watering: As necessary to keep top 2 inches of soil moist. Coordinate with Irrigation Contractor.

      2. Mowing: Mow newly planted grass areas weekly after initial growth reaches 2½ inches.

      3. Weeding: Remove weeds and foreign grass over plant areas at least once a week. Herbicides may be used only when approved by Architect/Owner.

5. **Condition of Surfaces:** Lawn areas will be graded with a minimum of 6 inches of topsoil as provided in Earthwork section. If in the opinion of the Architect/Owner the soil is compacted, rotor till to a depth of 4 inches.

6. **Acceptance:** The work will be accepted when a completed, undamaged stand of grass is achieved as approved by Owner.

7. **Seeding Schedules:** Bermuda grass, complete between May 1 and September 15.

8. **Sodding Schedules:**

   A. Sodding operations can be performed year round weather permitting. Do not install sod on frozen ground or if forecast calls for freezing conditions.

   B. Do not place sod without prior approval from Owner.

Materials

1. **Grasses:**

   A. Seed: Bermuda grass (Cynodon dactylon): Extra fancy, hulled and treated lawn type seed with purity of 95% or better and germination of 85% or better and per requirements of Texas Seed Law. Weed content less than ½%. No noxious weeds.

   B. Sod: Kentucky (KY-31) Fescue and Common Bermuda Grass (Cynodon dactylon). Free of foreign weeds and grasses. Cut sod with a full ¾ inch heavy clay soil covering roots. Do not cut sod more than 48 hours prior to planting.

2. **Fertilizer:**

   A. Provide a complete fertilizer, part of elements of which are derived from organic sources and shall include trace elements. Fillers to be sulphur and iron sulphate.

      1. First Application: 10-10-10 or similar analysis with minimum 8% sulphur and 4% iron, plus micronutrients.

      2. Second Application: 20-5-10 or similar analysis. Nitrogen source to be a minimum 50% slow release organic Nitrogen (SCU or UF) plus minimum 8% sulphur and 4% iron plus micronutrients.

3. **Mulch Fiber:** Virgin wood fiber for hydromulch - Weyerhauser or Conweb with green color additive.

4. **Tackifier:** Natural, non-asphaltic vegetable gum with gelling and hardening agents.

5. **Sharp Sand:** Clean, washed sand (fine aggregate) - ASTM C-33.

Execution

1. **Preparation:** Grading: Verify that lawn areas have been graded as provided in Earthwork.

2. **Final Grading/Seed Bed Preparation:**

   A. Loosen areas to be grassed and fine rake to break up lumps and produce a smooth, even grade, free from unsightly variations, ridges or depressions.

   B. Remove and dispose of stones one (1) inch or larger, sticks, roots, other debris and grass stubble exposed during this operation.

   C. Do not vary final grades more than 0.1 foot from finish elevations.

   D. Receive approval of fine grading from Owner prior to grass planting.

3. **Fertilizing:**

   A. First Application: Distribute 10-10-10- fertilizer uniformly at rate of 15 pounds per 1,000 square feet after initial germination.

   B. Second Application: Repeat fertilization with 20-5-10 commercial fertilizer after first two cuttings at rate of 15 pounds per 1,000 square feet.

   C. Water: Immediately water in fertilizer after each application.

4. **Grass Planting:**

   A. Sodding: After final grading, place sod so edges are touching. Lay across any changes in elevation. Lightly top dress with sharp sand to fill voids and grade smooth. Roll to eliminate undulations.

   B. Hydromulching:

      1. At time of seeding, soil to be moist but not muddy and wind velocity shall not exceed 10 miles per hour. Add water if required to moisten soil.

      2. Hydromulch Bermuda grass seed evenly at a rate of two (2) pounds per 1,000 square feet with wood cellulose fiber at a rate of fifty (50) pounds per 1,000 square feet.

      3. Add tackifier to mix for slopes 4:1 or greater at a rate of one (1) pound per bag of mulch.

5. **Performance:**

A. Establish a dense lawn of permanent grasses, free from lumps and depressions.

B. Reshoot any area failing to show uniform cover. Such replacement shall continue until a dense lawn is established. Scattered bare spots will not be allowed.

C. Mow and edge lawn a minimum of three times, each time after lawn has reached a height of 2½ - 3 inches. Mow to a height of 2 inches.

6. **Grade Maintenance and Erosion Damage:**

A. Maintain original grades of lawn areas after commencement of planting and during maintenance period.

B. Provide surface repair to ruts, ridges, tracks. Replant areas required for final acceptance.

7. **Acceptance:** The work will be accepted when a completed, undamaged stand of grass is achieved, as approved by Architect/Owner.

8. **Clean Up:** Keep premises neat and orderly including organization of storage areas. Remove trash and debris resulting from lawn preparation from site daily as work progresses. Leave paved areas in a broom clean condition by sweeping or hosing.

SUPPLEMENTAL SPECIFICATIONS FOR BRICK PAVERS

A. Products

1. Sand: Clean, screened mortar sand meeting the requirements of ASTM C-144.

2. Cement: Standard brand, domestic, portland cement, meeting the requirements of ASTM C-150, Type I.

B. Execution

1. Setting bed to consist of six parts damp sand to one part cement, mixed thoroughly.

2. Provide uniform thickness in setting bed such that top of paver is flush to top of concrete at all edges, and such that paver surface is uniform to prevent ponding of water.

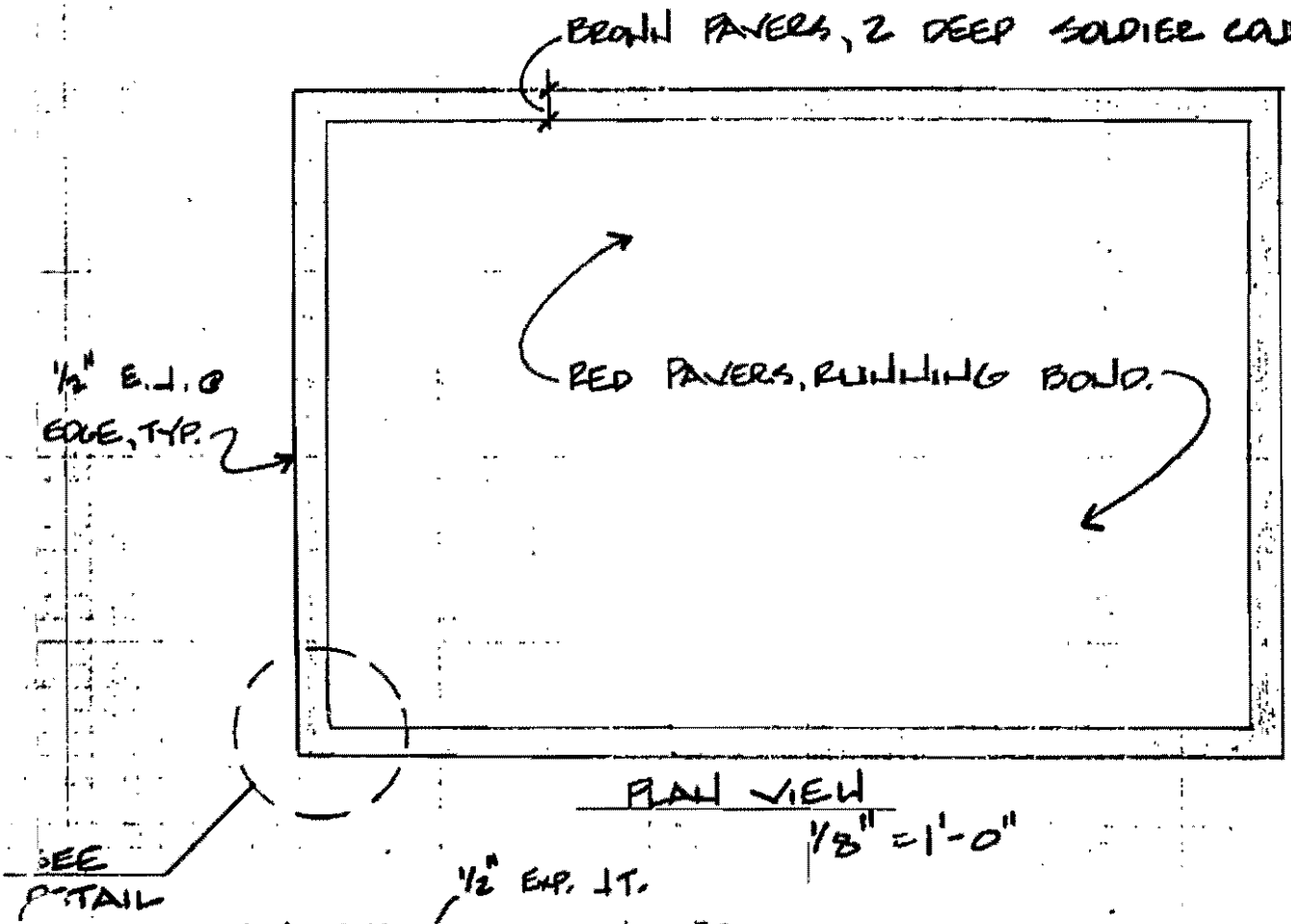
3. Provide one-half inch space at paver to concrete interface (edges) for backer rod and caulk bead by others.

4. Do not use pavers with chips, cracks, voids, discolorations or other defects which might be visible or cause staining in finished work.

5. Cut pavers with motor-driven saw equipment to provide clean, sharp, unchipped edges. Cut pavers to provide pattern indicated and to fit adjoining work neatly. Avoid use of small pieces (less than 2", any dimension) as possible.

6. Install pavers flush (1/32" unit-to-unit maximum offset). Butt joints of pavers tightly together in pattern indicated. Take care to insure pavers are firmly set and compacted over setting bed.

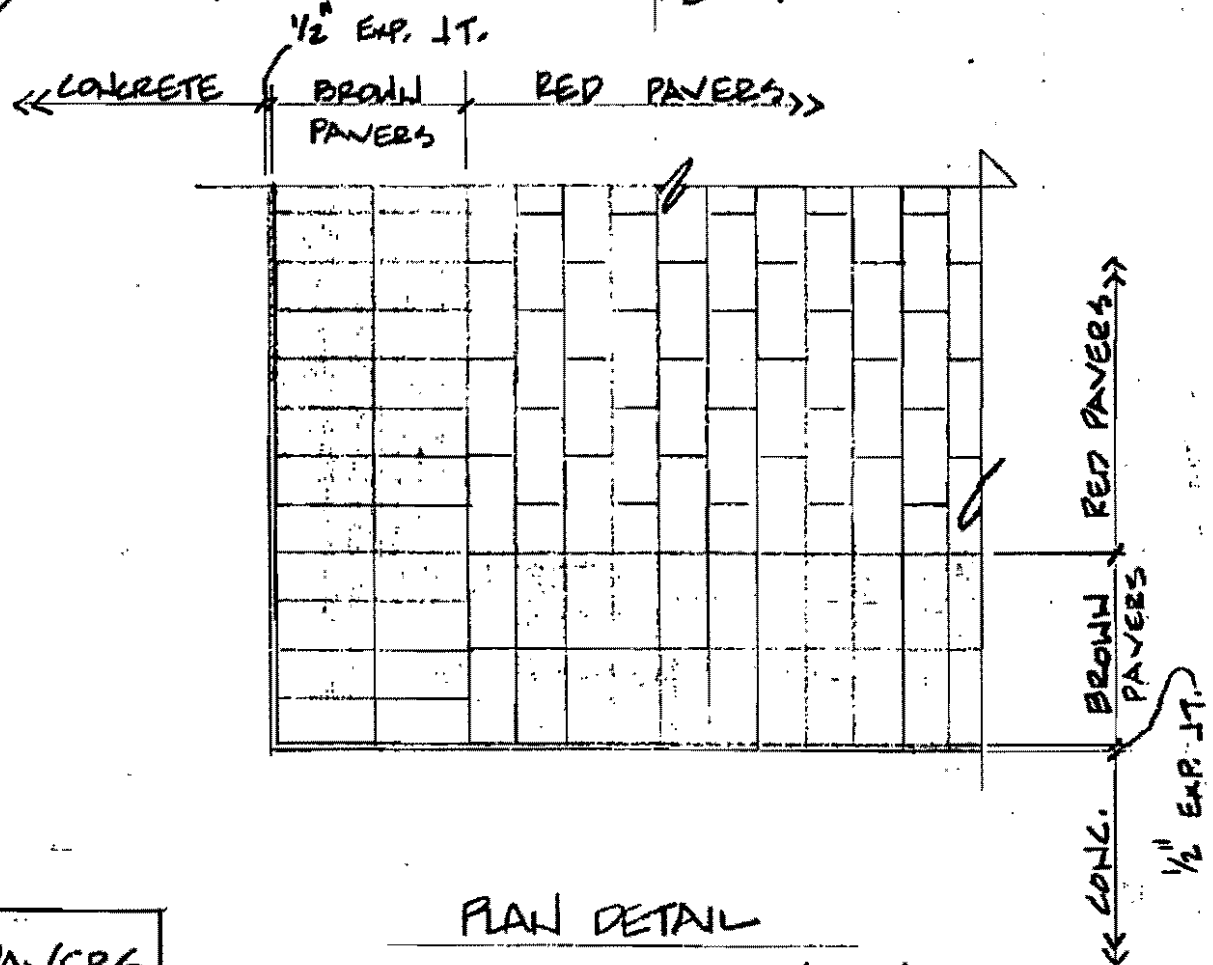
7. Clean all loose sand, cement, and scrap paver material from each area upon completion.



PLAN VIEW

1/8" = 1'-0"

SEE DETAIL



PLAN DETAIL

3/4" = 1'-0"

BRICK PAVERS

HUIE

MIDWAY ATRIUM #1

10-2-85

1

APPENDIX A

TEXAS SALES TAX EXEMPTION CERTIFICATE

01-319
(Rev. 11-81)

TEXAS SALES TAX EXEMPTION CERTIFICATE

Name of purchaser, firm or agency

Address (Street & number, P. O. Box or Route number) | Phone (Area code and no.)

City, state, zip code

I, the purchaser named above, claim an exemption from payment of sales taxes for the purchase of taxable items described below or on the attached order or invoice:

Description of items to be purchased, or on the attached order or invoice:

Purchaser claims this exemption for the following reason:

TAX EXEMPT USE BY POLITICAL SUBDIVISION OF THE STATE OF TEXAS

I understand that I will be liable for payment of Sales Tax which may become due for failure to properly with the provisions of the State, City and/or Metropolitan Transit Authority Sales and Use Tax Laws and Comptroller rules governing exempt purchases. Liability for the tax will be determined by the price paid for the taxable items purchased or the fair market rental value for the period of time used.

I understand that it is a misdemeanor to give an Exemption Certificate to the seller for taxable items which I know, at the time of purchase, will be used in a manner other than that expressed in this certificate and that upon conviction may be fined not more than $500 per offense.

sign here) Purchaser | Title | Date

NOTE: This certificate cannot be issued for the purchase, lease or rental of a motor vehicle.

THIS CERTIFICATE DOES NOT REQUIRE A NUMBER TO BE VALID.

Sales and Use Tax "Exemption Numbers" or "Tax Exempt" Numbers do not exist.

This certificate should be furnished to the supplier. Do not send the completed certificate to the Comptroller of Public Accounts.

APPENDIX B
SOIL BORING INFORMATION

ALPHA TESTING, INC.
2209 Wisconsin St., Suite 100
Dallas, Texas 75229
(214) 620-8911

RECORD OF SUBSURFACE EXPLORATION

Client: ESPEY, HUSTON & ASSOCIATES, INC.
Architect/Engineer:
Project Name: MIDWAY ROAD DRAINAGE PROJECT
Project Location: ADDISON, TEXAS

Boring No.: B-1 Station 2+80, 5' Left
Job No.: 95400
Drawn By: MP
Approved By: DAL

DRILLING AND SAMPLING INFORMATION

Date Started: 7-12-95
Date Completed: 7-12-95
Drill Foreman: EDI
Inspector:
Boring Method: CFA

Hammer Wt. ____ lbs.
Hammer Drop ____ in.
Spoon Sampler OD ____ in.
Rock Core Dia. ____ in.
Shelby Tube OD ____ in.

SOIL CLASSIFICATION / SURFACE ELEVATION	STRATUM DEPTH	DEPTH SCALE	SAMPLE NO.	SAMPLE TYPE	TEST DATA: % Passing No. 200	Texas Cone Penetration Test or Standard Penetration Test (Blows/Ft)	Soil Suction Test (Total), Cm of Water	Unconfined Compressive Strength Tons/Ft.	Pocket Penetrometer Tons/Ft.	Dry Unit Weight lbs./cu. ft.	Water Content %	LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index
Dark Brown CLAY(CH) with a trace of calcareous nodules			1	CA								
			2	CA								
		5	3	CA								
	7'		4	CA								
Tan and Gray CALCAREOUS CLAY(CL)	8'											
Tan weathered SHALY LIMESTONE			5	CA								
		10										
			6	CA								
		15										
BOTTOM OF TEST BORING @15'												

SAMPLER TYPE
SS - STANDARD PENETRATION TEST
ST - SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

GROUNDWATER OBSERVATIONS
AT COMPLETION DRY FT.
AFTER HRS. FT.
WATER ON RODS NONE FT.

BORING METHOD
HSA - HOLLOW STEM AUGERS
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVEN CASING
MD - MUD DRILLING

ALPHA TESTING, INC.
2209 Wisconsin St., Suite 100
Dallas, Texas 75229
(214) 620-8911

RECORD OF SUBSURFACE EXPLORATION

Client: ESPEY, HUSTON & ASSOCIATES, INC.
Architect/Engineer:
Project Name: MIDWAY ROAD DRAINAGE PROJECT
Project Location: ADDISON, TEXAS

Boring No.: B-2 Station 6+95, 5' Right
Job No.: 95400
Drawn By: MP
Approved By: DAL

DRILLING AND SAMPLING INFORMATION

Date Started: 7-13-95
Date Completed: 7-13-95
Drill Foreman: EDI
Inspector:
Boring Method: CFA

Hammer Wt. ____ lbs.
Hammer Drop ____ in.
Spoon Sampler OD ____ in.
Rock Core Dia. ____ in.
Shelby Tube OD ____ in.

SOIL CLASSIFICATION / SURFACE ELEVATION	STRATUM DEPTH	DEPTH SCALE	SAMPLE NO.	SAMPLE TYPE	TEST DATA: % Passing No. 200	Texas Cone Penetration Test or Standard Penetration Test (Blows/Ft)	Soil Suction Test (Total), Cm of Water	Unconfined Compressive Strength Tons/Ft.	Pocket Penetrometer Tons/Ft.	Dry Unit Weight lbs./cu. ft.	Water Content %	LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index
Tannish Brown and Brown CLAY(CH) with a trace of calcareous nodules and limestone gravel - FILL			1	CA								
			2	CA								
		5	3	CA								
	6'											
Tan and Tannish Brown CALCAREOUS CLAY(CL/CH) with limestone gravels -possible fill			4	CA								
			5	CA								
		10										
			6	CA								
		15										
BOTTOM OF TEST BORING @15'												

SAMPLER TYPE
SS - STANDARD PENETRATION TEST
ST - SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

GROUNDWATER OBSERVATIONS
AT COMPLETION 6 FT.
AFTER HRS. FT.
WATER ON RODS 6 FT.

BORING METHOD
HSA - HOLLOW STEM AUGERS
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVEN CASING
MD - MUD DRILLING

ALPHA TESTING, INC.
2209 Wisconsin St., Suite 100
Dallas, Texas 75229
(214) 620-8911

RECORD OF SUBSURFACE EXPLORATION

Client: ESPEY, HUSTON & ASSOCIATES, INC.
Architect/Engineer:
Project Name: MIDWAY ROAD DRAINAGE PROJECT
Project Location: ADDISON, TEXAS

Boring No.: B-3 Station 10+40, 8' Right
Job No.: 95400
Drawn By: MP
Approved By: DAL

DRILLING AND SAMPLING INFORMATION

Date Started: 7-13-95
Date Completed: 7-13-95
Drill Foreman: EDI
Inspector:
Boring Method: CFA

Hammer Wt. ____ lbs.
Hammer Drop ____ in.
Spoon Sampler OD ____ in.
Rock Core Dia. ____ in.
Shelby Tube OD ____ in.

SOIL CLASSIFICATION / SURFACE ELEVATION	STRATUM DEPTH	DEPTH SCALE	SAMPLE NO.	SAMPLE TYPE	% Passing No. 200	Texas Cone Penetration Test or Standard Penetration Test (Blows/Ft)	Soil Suction Test (Total), Cm of Water	Unconfined Compressive Strength Tons/Ft.	Pocket Penetrometer Tons/Ft.	Dry Unit Weight lbs./cu. ft.	Water Content %	LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index
Brown CLAY(CH) with a trace of calcareous nodules and limestone gravel	2'		1	CA								
Tan and Gray CALCAREOUS CLAY(CL) with limestone laminations	4'		2	CA								
Tan weathered SHALY LIMESTONE	8'	5	3	CA								
			4	CA								
Gray SHALY LIMESTONE			5	CA								
		10										
			6	CA								
BOTTOM OF TEST BORING @15'		15										

TEST DATA

SAMPLER TYPE
SS - STANDARD PENETRATION TEST
ST - SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

GROUNDWATER OBSERVATIONS
AT COMPLETION DRY FT.
AFTER HRS. FT.
WATER ON RODS NONE FT.

BORING METHOD
HSA - HOLLOW STEM AUGERS
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVEN CASING
MD - MUD DRILLING

ALPHA TESTING, INC.
2209 Wisconsin St., Suite 100
Dallas, Texas 75229
(214) 620-8911

RECORD OF SUBSURFACE EXPLORATION

Client: ESPEY, HUSTON & ASSOCIATES, INC.
Architect/Engineer:
Project Name: MIDWAY ROAD DRAINAGE PROJECT
Project Location: ADDISON, TEXAS

Boring No.: B-4 Station 14+95, 5' Left
Job No.: 95400
Drawn By: MP
Approved By: DAL

DRILLING AND SAMPLING INFORMATION

Date Started: 7-12-95
Date Completed: 7-12-95
Drill Foreman: EDI
Inspector:
Boring Method: CFA

Hammer Wt. ____ lbs.
Hammer Drop ____ in.
Spoon Sampler OD ____ in.
Rock Core Dia. ____ in.
Shelby Tube OD ____ in.

SOIL CLASSIFICATION / SURFACE ELEVATION	STRATUM DEPTH	DEPTH SCALE	SAMPLE NO.	SAMPLE TYPE	TEST DATA: % Passing No. 200	Texas Cone Penetration Test or Standard Penetration Test (Blows/Ft)	Soil Suction Test (Total), Cm of Water	Unconfined Compressive Strength Tons/Ft.	Pocket Penetrometer Tons/Ft.	Dry Unit Weight lbs./cu. ft.	Water Content %	LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index
Brown CLAY(CH) with a trace of calcareous nodules	2'		1	CA								
Tan and Gray CALCAREOUS CLAY(CL) with limestone laminations	4'		2	CA								
Tan weathered SHALY LIMESTONE with calcareous clay seams		5	3	CA								
			4	CA								
			5	CA								
		10										
-hard below 13'			6	CA								
		15										
BOTTOM OF TEST BORING @15'												

SAMPLER TYPE
SS - STANDARD PENETRATION TEST
ST - SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

GROUNDWATER OBSERVATIONS
AT COMPLETION **DRY** FT.
AFTER HRS. FT.
WATER ON RODS **NONE** FT.

BORING METHOD
HSA - HOLLOW STEM AUGERS
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVEN CASING
MD - MUD DRILLING

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KEY TO SOIL SYMBOLS AND CLASSIFICATIONS

THE ABBREVIATIONS COMMONLY EMPLOYED ON EACH "RECORD OF SUBSURFACE EXPLORATION", ON THE FIGURES AND IN THE TEXT OF THE REPORT, ARE AS FOLLOWS:

SOIL OR ROCK TYPES
(SHOWN IN SYMBOLS COLUMN)


CLAY


SILT


SAND


LIMESTONE


SHALE


ASPHALT/CONCRETE

I. SOIL DESCRIPTION

(A) COHESIONLESS SOILS

RELATIVE DENSITY	N, BLOWS/FT
VERY LOOSE	0 TO 4
LOOSE	5 TO 10
COMPACT	11 TO 30
DENSE	31 TO 50
VERY DENSE	OVER 50

(B) COHESIVE SOILS

CONSISTENCY	Qu, TSF
VERY SOFT	LESS THAN .25
SOFT	.25 TO .50
FIRM	.50 TO 1.00
STIFF	1.00 TO 2.00
VERY STIFF	2.00 TO 4.00
HARD	OVER 4.00

II. PLASTICITY

DEGREE OF PLASTICITY	PLASTICITY INDEX
NONE TO SLIGHT	0 - 4
SLIGHT	5 - 10
MEDIUM	11 - 30
HIGH TO VERY HIGH	OVER 30

NOTE: ALL SOILS CLASSIFIED ACCORDING TO THE UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)

III. RELATIVE PROPORTIONS

DESCRIPTIVE TERM	PERCENT
TRACE	1 - 10
LITTLE	11 - 20
SOME	21 - 35
AND	36 - 50

IV. PARTICLE SIZE IDENTIFICATION

BOULDERS	:	-8 INCH DIAMETER OR MORE
COBBLES	:	-3 TO 8 INCH DIAMETER
GRAVEL	:	-COARSE - 3/4 TO 3 INCH
		-FINE - 5.0 MM TO 3/4 INCH
SAND	:	-COARSE - 2.0 MM TO 5.0 MM
		-MEDIUM - 0.4 MM TO 2.0 MM
		-FINE - 0.07 MM TO 0.4 MM
SILT	:	-0.002 MM TO 0.07 MM
CLAY	:	-0.002 MM

V. DRILLING AND SAMPLING SYMBOLS

AU: AUGER SAMPLE
RC: ROCK CORE
TCP: TEXAS CONE PENETRATION TEST
SS: SPLIT-SPOON 1 3/8" I.D. 2" O.D. EXCEPT WHERE NOTED
ST: SHELBY TUBE = 3" O.D. EXCEPT WHERE NOTED
WS: WASHED SAMPLE
HSA: HOLLOW STEM AUGERS
CFA: CONTINUOUS FLIGHT AUGERS
MD: MUD DRILLING