

CONTRACT DOCUMENTS AND SPECIFICATIONS

TENNIS & PICKLEBALL COMPLEX

LAMAR COUNTY, MISSISSIPPI



NOVEMBER 2022



PREPARED BY:



CONTENTS

Bidders Information and Bid Forms

Advertisement for Bids	00030-1
Instructions to Bidders	00100-1
Bidder's Proposal	00300-1
Contract Forms	00500-1

Project Manual

EJCDC	00700-1
Supplementary Conditions.....	00800-1

Technical Specifications

Division 01 – General Requirements

01010 Summary of Work	01010-1
01025 Measurement and Payment.....	01025-1
01026 Schedule of Values	01026-1
01027 Applications for Payment	01027-1
01030 Special Project Procedures.....	01030-1
01041 Project Coordination	01041-1
01041.1 Utility Coordination	01041.1-1
01045 Cutting and Patching.....	01045-1
01050 Field Engineering.....	01050-1
01060 Regulatory Requirements.....	01060-1
01200 Project Meetings	01200-1
01310 Construction Schedules.....	01310-1
01340 Shop Drawings, Project Data, and Samples.....	01340-1
01410 Testing Laboratory Services	01410-1
01600 Material and Equipment.....	01600-1
01630 Substitutions.....	01630-1
01710 Cleaning	01710-1
01720 Project Record Documents	01720-1
01740 Warranties and Bonds	01740-1

Division 02 – Site Work

02050 Demolition	02050-1
02200 Excavation and Backfill.....	02200-1
02221 Crushed Stone, Gravel and Clay Gravel	02221-1
02270 Slope Protection and Erosion Control.....	02270-1
02790 Concrete Tennis Court Surface Color Coating System	02790-1

02830 Fences and Gates	02830-1
02920 Grassing	02920-1

Division 03 – Concrete

03315-1 Concrete.....	03315-1
03315-2 Post Tension Concrete Slab Tennis Court	03315-2

Division 13 – Shelters

13000-1 Shade Shelters.....	13000-1
-----------------------------	---------

Division 16 – Electrical

16010 General Requirements.....	16010-1
16020 Codes and Standards	16020-1
16030 Electrical Systems Schedule	16030-1
16040 Basic Materials and Methods.....	16040-1
16050 Utility Service	16050-1
16111 Conduit and Fittings.....	16111-1
16120 Wire and Cable	16120-1
16130 Boxes	16130-1
16140 Wiring Devices	16140-1
16160 Cabinets and Enclosures	16160-1
16170 Grounding and Bonding Systems	16170-1
16180 Equipment Wiring Systems	16180-1
16190 Supporting Devices.....	16190-1
16195 Electrical Identification.....	16195-1
16402 Underground Electrical Service.....	16402-1
16470 Lighting and Power Panelboards	16470-1
16501 Lamps.....	16501-1
16503 Lighting Poles and Standards.....	16503-1
16520 Court Lighting System.....	16520-1

Division 33 – Site Utilities

331113 Public Water Utility Distribution Piping	331113-1
312300 Excavation and Backfill	312300-1
330523.10 Buried Piping Installation	330523.10-1
333113 Public Sanitary Utility Sewer Piping	333113-1

ADVERTISEMENT FOR BIDS

**TENNIS & PICKLEBALL COMPLEX
LAMAR COUNTY, MISSISSIPPI**

Sealed bids will be received by Lamar County, Mississippi, in the Board Room located at the William “Pete” Gamble Chancery Courthouse, 403 Main Street, Purvis, Mississippi 39475, until 10:00 am, Local Time, Friday, December 16, 2022, for supplying all labor and materials (as specified) necessary for the Lamar County Tennis & Pickleball Complex.

The work generally consists of the following items:

- Construction of tennis and pickleball courts
- Retaining Walls
- Fencing
- Drainage & Earthwork
- Sidewalk

The above general outline of features of the work does not in any way limit the responsibility of the Contractor to perform all work and furnish all labor, equipment and materials required by the specifications and the drawings referred to therein.

Contract time shall be 120 consecutive calendar days from the effective date shown in the Notice to Proceed. Normal weather conditions are assumed and allowed for in the original contract time. Liquidated damages will be assessed in the amount of \$500 per day for each consecutive calendar day beyond the specified contract time.

Special Damages: In addition to the amounts provided for liquidated damages, expenses and other losses, Contractor, in the event of such default, shall pay to the Owner the actual costs, expenses and other losses reasonably incurred by Owner.

Bidder must be qualified under Mississippi Law and show current Certificate of Responsibility issued by the Mississippi State Board of Public Contractors establishing his classification as to the value and type of construction on which he is authorized to bid. Each Bidder shall write his Certificate of Responsibility Number on the outside of the sealed envelope containing his proposal.

Proposals shall be submitted in duplicate, sealed and deposited with Lamar County, Mississippi prior to the hour and date hereinbefore designated. Bids may also be submitted online through www.neel-schafferplans.com. No bidder may withdraw his bid within 90 days after the actual date of the opening thereof.

Each Bidder must submit with his proposal a separate attachment stating his qualifications to perform the work. The Statement of Qualifications shall list past projects of similar size and nature, a list of references with name and telephone number, a list of key personnel who will perform the work, and other information supporting the bidder's qualifications.

Awarding public contracts to non-resident Bidders will be on the same basis as the non-resident bidder's state awards contracts to Mississippi Contractors bidding under similar circumstances. In order to ensure that Mississippi's so-called Golden Rule is followed state law requires a non-resident bidder to attach to his bid a copy of his resident state's current laws pertaining to such state's treatment of non-resident contractors.

Each Bidder must deposit with his proposal, a Bid Bond or Certified Check in an amount equal to five percent of his bid, payable to Lamar County, Mississippi, as bid security. Bidders shall also submit a current financial statement, if requested, by Lamar County, Mississippi. The successful bidder will be required to furnish a Payment Bond and Performance Bond each in the amount of 100 percent of the contract amount.

Bid documents are being made available via paper copy or pdf. Plan holders are required to log-in or register for an account at www.neel-schafferplans.com to view and order Bid Documents. All plan holders are required to have a valid email address for registration. Bid documents are non-refundable and must be purchased through the website. Questions regarding website registration and online orders please contact Plan House Printing at (601) 336-6378.

Lamar County, Mississippi, is an Equal Opportunity Employer. Minority and Woman Owned Business Enterprises are solicited to bid on this contract as prime contractors and are encouraged to make inquiries regarding potential subcontracting opportunities and equipment, material and/or supply needs. Lamar County, Mississippi, hereby notifies all Bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, Minority and Woman Owned Business Enterprises will be afforded the full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

The Engineer is Neel-Schaffer, Inc., 704 Hardy Street, Hattiesburg, Mississippi, 39401; Phone No. (601) 545-1565, Fax No. (601) 545-2267.

The award of the Contract, if it is awarded, will be to the lowest responsible Bidder whose qualifications indicate that the award will be in the best interest of Lamar County, Mississippi. The Lamar County Board of Supervisors reserves the right to reject any and all bids and to waive informalities.

BY: _____
Warren Byrd, District 2 Supervisor
Lamar County, Mississippi

DATES OF PUBLICATION:

Ad 1 – November 17, 2022

Ad 2 – November 23, 2022

INSTRUCTIONS TO BIDDERS
TENNIS & PICKLEBALL COMPLEX
LAMAR COUNTY, MISSISSIPPI

CONTENTS

1.	Coordination of Specifications	00100-2
2.	Date and Place of Opening of Proposals.....	00100-2
3.	Form for Proposals.....	00100-2
4.	Prequalification	00100-3
5.	Certificate of Responsibility	00100-3
6.	Annual License to Bid	00100-3
7.	Charges for Proposals, Plans and Specifications	00100-3
8.	Omissions and Discrepancies	00100-3
9.	Addenda	00100-4
10.	Interpretations	00100-4
11.	Bid Security	00100-4
12.	General Information.....	00100-4
13.	Rejection of Proposal.....	00100-4
14.	Conditions of Work.....	00100-5
15.	Security for Faithful Performance	00100-5
16.	Insurance	00100-5
17.	Subcontractors	00100-5
18.	Method of Award - Lowest Responsive Bidder.....	00100-5
19.	Obligation of Bidder	00100-6
20.	Subsurface Data	00100-6
21.	Execution of Contract	00100-6
22.	Interchangeable Terms.....	00100-6
23.	Qualifications of Bidder, Owner's Rights	00100-6
24.	Materials and Equipment	00100-7
25.	Non-Resident Bidders	00100-7
26.	Division 907 – Special Provisions	00100-7
27.	Contract Time	00100-7

1. COORDINATION OF SPECIFICATIONS

Work under this Contract shall be performed in accordance with the Contract Documents, which includes General Conditions, Supplementary Conditions and Technical Specifications contained therein. Division 200 through 800 of the *Mississippi Standard Specifications for Road and Bridge Construction*, 2017 Edition (can be downloaded at www.gomdot.com) is made a part hereof as if it were attached hereto, except where superseded by special provisions contained herein.

2. DATE AND PLACE OF OPENING OF PROPOSALS

The date, time, and place for opening Proposals will be as set out in the published "Advertisement for Bids."

The city of Laurel, Mississippi, herein called "Owner" reserves the right to postpone the date for presentation and opening of Proposals and will give notice of any such postponement to each known prospective Bidder.

3. FORM FOR PROPOSALS

Proposals must be submitted in duplicate on the forms furnished by the Owner and the envelope containing the Proposals must be sealed and addressed to:

Lamar County Board of Supervisors
403 Main Street
Purvis, Mississippi 39475

The outside of the envelope containing the Proposal shall bear the inscription:

**SEALED BID FOR: LAMAR COUNTY BOARD OF SUPERVISORS
TENNIS & PICKLEBALL COMPLEX
LAMAR COUNTY, MISSISSIPPI**

BY _____

Certificate of Responsibility No. _____

State License No. _____

The duplicate Proposals shall be in the form of one original Proposal, marked "ORIGINAL" and one photocopy (Xerox or similarly reproduced copy) marked "PHOTOCOPY" of the original Proposal.

If Proposals are forwarded by the U.S. Postal Service, delivery shall be by Registered or Certified Mail.

4. PREQUALIFICATION

Contractors desiring to Bid on proposed construction contracts who have not been prequalified by the city of Laurel, Mississippi, shall file with the Owner a current financial statement showing assets and liabilities as a prerequisite to entering into contracts with the Owner. If prequalification is required, the appropriate submittal information will be requested from bidders during the bid evaluation performed by the Engineer and Owner after receipt of Proposals.

All Bidders must be in good standing with the city of Laurel. Good standing includes, among other things: (a) whether Bidder is currently delinquent on the completion of work or punchlist items under another city of Laurel contract for which it was a successful bidder; (b) whether Bidder is currently in default under another city of Laurel contract for which it was a successful bidder; and (c) whether Bidder has failed to fulfill provisions of another city of Laurel contract for which it was a successful bidder, during the past two years.

5. CERTIFICATE OF RESPONSIBILITY

Prior to filing Bids on Owner projects (in excess of \$50,000), the prospective Bidder must obtain a Certificate of Responsibility from the Mississippi State Board of Public Contractors, establishing his classification as to the value and the type of construction on which he is authorized to bid. Application must be submitted to the Board at least 30 days prior to a regular Board meeting scheduled every Quarter on the first Tuesday of January, April, July and October.

6. ANNUAL LICENSE TO BID (Not Used)

7. CHARGES FOR PROPOSALS, PLANS AND SPECIFICATIONS

Bid documents are being made available via paper copy or pdf. Plan holders are required to log-in or register for an account at www.neel-schafferplans.com to view and order Bid Documents. All plan holders are required to have a valid email address for registration. Bid documents are non-refundable and must be purchased through the website. Questions regarding website registration and online orders please contact Plan House Printing at (601) 336-6378.

No refunds will be made for return of Plans or Specifications.

If a contract award is made, the successful Bidder will be furnished (free of charge) two additional sets of the Plans and Specifications.

In the event all Bids are rejected and the Project is readvertised, the original Bidders shall **NOT** be entitled to free Bidders Proposal forms for the subsequent letting.

8. OMISSIONS AND DISCREPANCIES

Should a Bidder find discrepancies, errors or omissions in the Drawings or Specifications, or should he be in doubt as to the correctness of the Plan details, dimensions and layout, he should immediately notify the Engineer in order to permit checking and any necessary revisions or modifications.

9. ADDENDA

Prior to the date set for opening of Bids, the right is reserved, as the interests of the City of Laurel, Mississippi, may require, to revise or amend the Contract Documents. Such revisions, if any, will be announced by an Addendum or Addenda, and copies of such Addenda will be furnished to all prospective Bidders who have purchased Plans and Specifications for acknowledgment by return fax or email. If the revisions and Addenda are of a nature which require material changes in quantities or prices Bid, or both, the date set for opening Bids may be postponed to enable Bidders to revise their Bids. In such case, the Addendum or Addenda will include an announcement of the new date for opening Bids.

10. INTERPRETATIONS

No oral interpretation made to any Bidder as to the meaning of the Contract Documents shall be considered an effective modification of any of the provisions of the Contract Documents. In order to ensure appropriate and concise responses, and avoid any misinterpretations, no verbal questions will be received. Written requests for interpretation of the Plans and Specifications shall be submitted to the Engineer at least 10 days prior to opening of Proposals so that a formal decision can be given in writing to all known prospective Bidders in the form of an Addendum. The Contract Document contains the provisions required for the construction of the Project. Information obtained from an officer, agent, or employee of the Owner or any other person shall not affect the risks or obligations assumed by the Contractor or relieve him from fulfilling any of the conditions of the Contract.

11. BID SECURITY

All Bids shall be accompanied by a Bid Security in the form of a Certified Check upon a national or state bank or a Bid Bond made by a bonding company registered in the State of Mississippi, drawn and made payable to the order of the city of Laurel, Mississippi, in an amount equal to five percent of the Bid. The Certified Check or Bid Bond must be enclosed in the same envelope with the Bid. Except as noted below, the Bid Security of all known unsuccessful Bidders will be returned promptly after a Notice of Award has been sent to the successful Bidder or in the event that all Bids are rejected.

The Bid Security of the next two lowest qualified Bidders will be retained until the Contract has been executed with the lowest qualified Bidder. The Bid Security of the successful Bidder will be returned when satisfactory Performance and Payment Bonds have been furnished and approved and the Contract executed.

12. GENERAL INFORMATION

Bidders shall inform themselves and comply with all pertinent city regulations and ordinances, State and Federal laws, licenses and tax liabilities which may in any manner affect their Bids and the prosecution of the work. The successful bidder will be responsible for obtaining all building, plumbing, and electrical permits required by the local city government. Special attention is directed to the rules and regulations published by the Mississippi State Tax Commission outlining certain taxes imposed on Contractors by the state of Mississippi.

13. REJECTION OF PROPOSAL

Proposals may be rejected in the case of any omission, alterations of forms, additions or conditions

not called for, unauthorized alternate Bids, incomplete Bids, erasures or irregularities of any kind. Bids received conditioning their consideration or rejection upon Bids for the other work submitted by the same Bidder may be classed as irregular, unless the Contract Documents specifically invite or permit conditional or combination Bids. Bids in which the prices obviously are unbalanced may be rejected.

14. CONDITIONS OF WORK

Each Bidder must inform himself fully of the conditions relating to the construction of the Project and the employment of labor thereon. Failure to do so will not relieve a successful Bidder of his obligation to furnish all materials and labor necessary to carry out the provisions of his Contract. Insofar as possible, the Contractor, in carrying out his work, must employ such methods or means as will not cause any interruption of or interference with the work of any other Contractor.

15. SECURITY FOR FAITHFUL PERFORMANCE

Simultaneously with his delivery of the Executed Contract, the Contractor shall furnish a Performance Bond and a Payment Bond each in the sum of 100% of the Contract amount as security for faithful performance of his Contract and for the payment of all persons performing labor on the Project under his Contract and furnishing materials in connection with his Contract, as specified in the Contract Documents. The surety of such Bonds shall be issued by a duly authorized surety company listed on the Treasury Department's most current list Circular 570 (as amended) and satisfactory to the city of Laurel, Mississippi.

Attorneys in fact who sign Bid Bonds or Payment Bonds and Performance Bonds must file with each bond a certified and effective dated copy of their Power of Attorney. Failure of the successful Bidder to execute the Contract and to supply the required bonds within 10 calendar days from the date that the Notice of Award is delivered, or within such extended period as the Owner may grant based upon reasons determined sufficient by the Owner, shall constitute a default, and the Owner, at his discretion, may either award the Contract to the next lowest qualified Bidder or readvertise for Bids, and may charge against the Bidder the difference between the amount for which a Contract for the work is subsequently executed, irrespective of whether the amount thus due exceeds the amount of the Bid Bond. If a more favorable bid is received by readvertising, the defaulting Bidder shall have no claim against the Owner for a refund. The Contractor's bond will not be released until all provisions of the Contract have been fulfilled.

16. INSURANCE

The Contractor will be required to carry the types and amounts of insurance named in the Contract Documents for the full life of the Contract.

17. SUBCONTRACTORS

Bidders are specifically advised that any person, firm or other party to whom it is proposed to award a Subcontract must be acceptable to the Owner. Nothing contained in the Contract Documents shall create any contractual relation between subcontractor and the Owner.

18. METHOD OF AWARD - LOWEST RESPONSIVE BIDDER

The city of Laurel, Mississippi, will award the Contract to the lowest and best Bid unless all Bids are

rejected. The award will be based on the evaluation of the low bid for the total base bid or the total alternate bid as decided upon by the Owner.

The responsiveness of the low Bidder shall be determined by (1) the completeness and regularity of the Bidders Proposal; (2) the Bidders Proposal being without exclusions or special conditions; (3) the Bid Form having no alternative Bids for any item unless requested in the Technical Specifications; and (4) such other factors as may be considered under State law, Federal law or regulation.

The evaluation of the low bidder will be based on whether the Bidder (1) maintains a permanent place of business; (2) has adequate plant equipment to do the work properly and within the time limit that is established; (3) has adequate financial status to meet his obligations contingent to the work; (4) has adequate manpower and present workload is such that he can perform according to a reasonable schedule; and (5) such other factors as may be considered under State law, Federal law or regulation.

19. OBLIGATION OF BIDDER

At the time of the opening of Bids, each Bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the Plans and Contract Documents (including all Addenda).

The failure or omission of any Bidder to examine any form, instrument or document shall in no way relieve any Bidder from any obligation in respect to his Bid. Submission of Bid shall be accepted as prima facie evidence that Bidder has inspected the site and is familiar with the Plans and Contract Documents.

20. SUBSURFACE DATA (Not Used)

21. EXECUTION OF CONTRACT

If the successful Bidder is a corporation, the officer who signs the Contract shall furnish copies of the resolution of the Directors of the corporation authorizing him to sign the contract. Such resolution should bear the seal of the corporation.

Subject to the applicable provisions of law, the Contract shall be in full force and effect only from and after the date when a fully executed and approved counterpart thereof has been rendered or delivered, or both, to the Contractor or his duly authorized agent or representative. Deposit of said counterpart in the United States mail in an envelope or wrapper properly addressed shall constitute compliance with these provisions by the Owner.

22. INTERCHANGEABLE TERMS

The terms "Bid" and "Proposal" wherever they are used in the Contract Documents are interchangeable and have the same meaning. The terms, "city of Laurel, Mississippi" and "Owner", are interchangeable and have the same meaning. The terms "Contract" and "Agreement", are interchangeable and have the same meaning. The terms Contract Drawings and Plans, are interchangeable and have the same meaning.

23. QUALIFICATIONS OF BIDDER, OWNER'S RIGHTS

The Owner may make such investigation as it deems necessary to determine the ability of the Bidder

to perform the work, and the Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by or investigation of such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Contract and to complete the work contemplated therein.

24. MATERIALS AND EQUIPMENT

Whenever materials or equipment are specified or described in the Contract Documents by using the name of a manufacturer, fabricator, supplier, or distributor, the naming of the item in this manner is intended to establish the type, function and quality required. Materials or equipment of other manufacturers, fabricators, suppliers, or distributors may be accepted by the Engineer if sufficient information is submitted by the Contractor to allow the Engineer to determine that the material or equipment proposed is equivalent to that named in the Contract Documents. Bidders are referred to Section 6.3 of the General Conditions regarding procedures for approval of substitute materials and equipment.

25. NON-RESIDENT BIDDERS

Awarding public contracts to non-resident Bidders will be on the same basis as the non-resident Bidder's state awards contractors to Mississippi Contractors bidding under similar circumstances. In order to ensure that Mississippi's so called "Golden Rule" is followed, state law requires a non-resident Bidder to attach to his bid a copy of his resident state's current laws pertaining to such state's treatment of non-resident contractors.

26. DIVISION 907 – SPECIAL PROVISIONS

Division 907 of the Contract Documents includes one Special Provision to the Mississippi Standard Specification for Road and Bridge Construction. Any references made to the pay item or measurement and payment for materials or items of work in the special provision shall be disregarded. All items of work shall be paid based on Section 01025 of the Contract Documents.

27. CONTRACT TIME

The Contractor shall commence the work required by the Contract Documents within 10 calendar days after the date of the Notice to Proceed and will retain substantial completion for the Work within **120 calendar days** extended otherwise by the Contract Documents.

BIDDER'S PROPOSAL
TENNIS & PICKLEBALL COMPLEX
LAMAR COUNTY, MISSISSIPPI

CONTENTS

Bidder's Proposal	00300-2
Prices Bid and Approximate Quantities	00300-4
Bidder's Corporate Declaration	00300-7
Non-Collusion Affidavit	00300-8
Bid Bond	00300-9
Proposed Subcontractors	00300-11

BIDDER'S PROPOSAL

**TENNIS & PICKLEBALL COMPLEX
LAMAR COUNTY, MISSISSIPPI**

DATE: _____, 20_____

PROPOSAL OF _____
(Name of Bidder)

(Address of Bidder)

for construction of the Daphne Park Improvements – Tennis Courts Reconstruction Project.

The documents on which this Proposal is based include the Instructions to Bidders, Bid Forms, General Conditions, Supplementary Conditions, Supplemental General Conditions, Technical Specifications, Contract Drawings, and all supplements, amendments and addenda for this Project and are made a part hereof by reference.

**TO: LAMAR COUNTY BOARD OF SUPERVISORS
403 MAIN STREET
PURVIS, MISSISSIPPI 39475**

Gentlemen:

The following Proposal is submitted on behalf of the undersigned Bidder(s) and no others. Evidence of my (our) authority to submit the Proposal is hereby furnished. The Proposal is submitted without collusion on the part of any person, firm or corporation.

I (We), the undersigned Bidder(s), certify that I (we) have carefully examined the Instructions to Bidders, Bid Forms, General Conditions, Supplemental Conditions, Technical Specifications, Contract Drawings and any and all Addenda thereof.

I (We) further certify that I, (we) have visited and carefully examined the site of the proposed Work and have inspected the location and condition of all public utilities and existing structures or other facilities on the site or adjacent thereto which may be affected by the proposed construction and fully understand all conditions relative to construction difficulties, hazards, labor, transportation and all other factors affecting the prosecution of the work covered by this Proposal.

I (We) understand that the quantities mentioned below are approximate only and are subject to either increase or decrease, and hereby propose to perform any increased or decreased quantities of work at the unit prices bid. No increase in quantities of work shall be performed until a written change order is duly executed in advance and approved in the public minutes of the Owner.

In accordance with the requirements of the Instructions to Bidders, Bid Forms, Federal Supplement to Bidder's Proposal, Technical Specifications, General Conditions, Supplementary Conditions, Contract Drawings, and any Addenda, I (we) propose to furnish all necessary materials, equipment, labor, tools and

00300-2

other means of construction and will do all Work called for by the Contract Documents within the specified Contract Time. The following is my (our) itemized proposal for the project:

Prices Bid and Approximate Quantities – Base Bid

Pay Item	Pay Item Description	Unit	Estimated Quantity	Unit Price	Item Total
1.0	Excess Excavation	CY	50		
2.0	Unclassified Excavation	CY	50		
3.0	Borrow Material	CY	50		
4.0	Site Grading	SY	17,500		
5.0	Erosion Control	LS	1	XXXX	
6.0	Grassing	ACRE	2.0		
7.0	Post Tensioned Concrete Slab, 4" Thickness (Includes Net Post Footings)	SY	8,860		
8.0	Acrylic Surfacing, Medium Texture, 2 Colors (2 coats each color)	SY	8,860		
9.0	Tennis Line Paint, Per Court	EA	8		
10.0	Pickleball Line Paint, Per Court	EA	8		
11.0	Net & Net Posts (Pickleball)	EA	8		
12.0	Net & Net Posts (Tennis)	EA	8		
13.0	Concrete Sidewalk, 4" Thickness	SY	1,450		
14.0	Artificial Turf (Turf, Cooling Infill, Stone Base, & Drainage)	SF	6,650		
15.0	Stair 1	EA	1		

00300-4

16.0	Stair 2	EA	1		
17.0	Handrail	LF	40		
18.0	Fencing, 10' Black Vinyl Chain Link	LF	1700		
19.0	Fencing, 6' Black Vinyl Chain Link	LF	735		
20.0	Fencing, 4' Black Vinyl Chain Link	LF	205		
21.0	Gates, Black Vinyl Chain Link (Single)	EA	4		
22.0	Fencing, 6' Decorative Aluminum	LF	155		
23.0	Gates, 6' Decorative Aluminum (Double)	EA	2		
24.0	Gates, 4' Decorative Aluminum (Double)	EA	2		
25.0	Wind Fabric	SF	11,280		
26.0	Small Shade Shelter	EA	12		
27.0	Large Shade Shelter	EA	2		
28.0	Bleacher	EA	2		
29.0	Bench	EA	12		
30.0	Electrical & Lighting – Foundations, Conduit & Controls	LS	1	XXXX	
31.0	Water Service	LS	1	XXXX	
32.0	Sanitary Sewer Service	LS	1	XXXX	
33.0	Mobilization	LS	1	XXXX	
34.0	Construction Staking	LS	1	XXXX	

Total Base Bid =

Prices Bid and Approximate Quantities – Additive Alternate 1

Pay Item	Pay Item Description	Unit	Estimated Quantity	Unit Price	Item Total
A1	Electrical & Lighting – Poles, Fixtures, & Wiring	LS	1	XXXX	

Total Additive Alternate 1 =

Total Bid (Base Bid + Additive Alternate 1) =
--

THE BIDDER'S TOTAL ABOVE IS HIS TOTAL BID BASED ON HIS UNIT PRICES AND LUMP SUM PRICES AND THE ESTIMATED QUANTITIES. THIS FIGURE IS FOR INFORMATION ONLY AT THE TIME OF OPENING BIDS. THE OWNER WILL MAKE THE BID TABULATION FROM THE UNIT PRICES AND LUMP SUM PRICES BID. IF THERE IS AN ERROR IN THE TOTAL BY THE BIDDER, IT SHALL BE CHANGED AS ONLY THE UNIT PRICES AND LUMP SUM PRICES SHALL GOVERN.

NOTE: FAILURE OF BIDDER TO INCLUDE PRICES FOR THE ALTERNATE BID ITEMS MAY RENDER HIS PROPOSAL NON-RESPONSIVE.

NOTE: Bids shall include sales tax and all other applicable taxes and fees.

00300-6

I (We) further propose to execute the Contract Agreement as bound herein within ten working days after receipt of Contract Forms from the Owner and to complete the work within the contract time. I (We) agree to pay as liquidated damages the actual costs, expenses and other losses reasonably incurred by Owner for each consecutive calendar day beyond the specified Contract Time.

I (We) also propose to execute a Performance Bond and a Payment Bond, as shown in the Specifications, each in an amount of not less than one hundred percent (100%) of the total of my (our) Bid. These Bonds shall not only serve to guarantee the completion of the Work on my (our) part, but also to guarantee the excellence of both workmanship and materials until the Work is finally accepted.

I (We) enclose a Bid Bond or Certified Check for 5 percent of _____
_____, DOLLARS (\$_____))
(Base Bid Amount)

and hereby agree that in case of my (our) failure to execute the Contract and furnish the Bonds within ten calendar days after delivery of the Notice of Award, the amount of this check (Bid Bond) will be forfeited to the Owner as liquidated damages arising out of my (our) failure to execute the Contract as proposed.

It is understood that in case I (we) am (are) not awarded the Work, the Certified Check or Bid Bond submitted as Bid security will be returned as stipulated in the Contract Documents.

Bidder acknowledges receipt of the following Addenda:

No. _____	Dated _____	No. _____	Dated _____
No. _____	Dated _____	No. _____	Dated _____
No. _____	Dated _____	No. _____	Dated _____
No. _____	Dated _____	No. _____	Dated _____

Respectfully Submitted,

Contractor(s)

By: _____
Title

Address

BIDDER'S CORPORATE DECLARATION
(TO BE FILLED IN IF BIDDER IS A CORPORATION)

Date: _____, 20_____.

Our corporation is chartered under the Laws of the state of _____ and the names, titles and business addresses of the executives are as follows:

President

Secretary

Treasurer

DECLARATION OF PARTNERSHIP

(To be filled in if a Bidder is a Partnership)

Our Partnership is composed of the following individuals:

Address

Address

NON-COLLUSION AFFIDAVIT

**TENNIS & PICKLEBALL COMPLEX
LAMAR COUNTY, MISSISSIPPI**

(THIS AFFIDAVIT MUST BE EXECUTED FOR THE BID TO BE CONSIDERED)

STATE OF _____)
) ss.
COUNTY OF _____)

_____ being first duly sworn,
(Person)
deposes and says that he is _____

(Sole owner, a partner, president, secretary, etc.)
of _____ the party making the foregoing Proposal or Bid;
(Name of Firm)

that such Bid is genuine and not collusive; that said Bidder is not financially interested in, or otherwise affiliated in a business way with any other bidder on the same contract; that said Bidder has not colluded, conspired, connived, or agreed, directly or indirectly, with any bidder or person, to put in a sham bid, or that such other person shall refrain from bidding, and has not in any manner, directly or indirectly sought by agreement or collusion, or communication or conference, with any person, to fix the bid price of affiant or any other bidder, or to fix any overhead, profit or cost element of said bid price, or of that of any other bidder, or to secure any advantage against the Owner or any person or persons interested in the proposed contract; and that all statements contained in said Proposal or Bid are true; and further, that such Bidder has not, directly or indirectly submitted his Bid, or the contents thereof, or divulged information or data relative thereto to any association or to any member or agent thereof.

Affiant

Sworn to and subscribed before me this _____ day of _____, 20_____.

Notary Public in and for

_____ County,

(SEAL)

My Commission Expires
_____, 20_____.

BID BOND

**TENNIS & PICKLEBALL COMPLEX
LAMAR COUNTY, MISSISSIPPI**

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned _____ as Principal, and _____ as Surety, are hereby held and firmly bound unto the Owner, in the penal sum of \$_____ for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns. Signed this ____ day of _____, 20 _____.

The condition of the above obligation is such that whereas the Principal has submitted to the Owner, a certain bid, attached hereto and hereby made a part hereof to enter into a contract in writing for the above referenced project.

NOW THEREFORE,

- (a) If said Bid shall be rejected, or in the alternate,
- (b) If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said Bid) and shall furnish a bond for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bid,

then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Owner may accept such Bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to signed by their proper officers, the day and year first set forth above.

Contractor

SEAL

By:_____

Surety

SEAL

By:_____

PROPOSED SUBCONTRACTORS

**TENNIS & PICKLEBALL COMPLEX
LAMAR COUNTY, MISSISSIPPI**

The names and addresses of all persons and parties who will be utilized for subcontract Work in the foregoing Bidder's Proposal are listed below. (The Contractor must list all Subcontractors to be utilized on the Work. Failure to list Subcontractors may cause the Bidder's Proposal to be rejected by the Owner as non-responsive.) If the Bidder does not propose Subcontractors, so state.

NAME

ADDRESS

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

CONTRACT FORMS

**TENNIS & PICKLEBALL COMPLEX
LAMAR COUNTY, MISSISSIPPI**

CONTENTS

Contract.....	00500-2
Partnership Certificate	00500-5
General Instructions for Bonds	00500-6
Performance Bond	00500-7
Payment Bond.....	00500-9
Notice of Award.....	00500-11
Notice to Proceed.....	00500-13
Contract Change Order	00500-15

CONTRACT

**TENNIS & PICKLEBALL COMPLEX
LAMAR COUNTY, MISSISSIPPI**

This Contract, made this the _____ day of _____, 20____, by and between Lamar County, Mississippi, a municipal corporation, hereinafter called "Owner" and _____ doing business as a _____ located in _____ hereinafter called the "Contractor".

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned:

1. THE CONTRACTOR will commence and complete the "Tennis & Pickleball Complex" project in strict accordance with the Contract Documents and the Contract Drawings.
2. The Contractor will commence the work required by the CONTRACT DOCUMENTS within 10 calendar days after the date of the NOTICE TO PROCEED and will attain Final Completion within the contract time stipulated in the Advertisement for Bids unless the period for completion is extended otherwise by the CONTRACT DOCUMENTS. The Contractor agrees to pay, as liquidated damages, the actual damages, costs, losses and expenses reasonably incurred by Owner for each consecutive calendar day that he shall be in default in attaining Final Completion within the time stipulated as provided herein.
3. The term "CONTRACT DOCUMENTS" means and includes Advertisement for Bids, Instructions to Bidders, Bidder's Proposal, Bid Bond, Contract, Payment Bond, Performance Bond, General Conditions, Supplementary Conditions, Technical Specifications, Contract Drawings, Notice of Award, Notice to Proceed, Addenda (if any), and all subsequent Change Orders, Supplemental Agreements and/or other modifications as if formally recopied in this Contract.
4. The Contractor agrees to furnish all materials in place and to faithfully complete all of said work contemplated by this Contract in good and workmanlike manner, strictly in accordance with said Contract Documents, Contract Drawings and other requirements of the Owner, and to the complete satisfaction of the Owner or his authorized representatives, and in accordance with the Laws of the state of Mississippi and the Ordinances of the Owner, for which the Owner hereby agrees to pay and the Contractor agrees to accept a sum of money in current funds equal to the contract amount of _____ plus the amount of any supplemental agreements and force accounts for extra work authorized and duly set forth in a written change order approved and executed by the Owner and set forth in the public minutes of the Owner and in full compensation for furnishing all materials, the doing of all work contemplated under the Contract, as well as all loss or damage, if any, arising out of the nature of the work, or the action of the weather, and any and all other unforeseen obstructions or difficulties that may be encountered in the prosecution of the same, the Contractor assuming all risks of every kind and description in the performance of this Contract.
5. The Contractor shall protect, indemnify and save harmless the Owner from and against any and all damage, loss, claims, judgments or expenses, including but not limited to reasonable attorney's fees, which the Owner may suffer or be subjected to by the performance of the

work, including but without limitation injury to or death of any person whomever and destruction or damage to any property whatsoever.

6. Attached hereto and made a part of this Contract is a Performance Bond, executed by a Surety Company doing business in the state of Mississippi, in the sum of _____.
7. Attached hereto and made a part of this Contract is a Payment Bond, executed by a Surety Company doing business in the state of Mississippi, in the sum of _____.
8. The Contractor agrees to allow the Owner, or any of their duly authorized representatives, access to any books, documents, papers and records of the Contractor which are directly pertinent to the project which is the subject of this Contract, for the purpose of making audits, examinations, excerpts and transcriptions, and Contractor agrees to insert an identical clause in any and all subcontracts.
9. The Owner will pay to the Contractor in the manner and at such times and amounts as set forth in the Contract Documents.
10. This Contract shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.
11. If, through any cause, the Contractor shall fail to fulfill in a timely and proper manner his obligations under this Contract, or if the Contractor shall violate any of the covenants, agreements, or stipulations of this Contract, the Owner shall thereupon have the right to terminate this Contract by giving written notice to the Contractor of such termination and specifying the effective date thereof, at least five days before the effective date of such termination. Notwithstanding the above, the Contractor shall not be relieved of liability to the Owner for damages sustained by the Owner by virtue of any breach of the Contract by the Contractor and the Owner may withhold any payments to the Contractor until such time as the exact amount of damages due the Owner from the Contractor is determined.

IN WITNESS THEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Contract in five (5) counterparts, each of which shall be deemed an original on the date first above written.

OWNER

CONTRACTOR

BY _____

BY _____

ATTEST _____

ATTEST _____

(Seal)

(Seal)

PARTNERSHIP CERTIFICATE

State of _____

County of _____ Ss.

On this _____ day of _____, 20_____, before me personally appeared _____, known to me and known by me to be the person who executed the above instrument, who being by me first duly sworn, did depose and say that he is a general partner in the firm of _____; that said firm consists of himself and _____; and that he executed the foregoing instrument on behalf of said firm for the uses and purposes stated herein.

Notary Public in the

County of _____

State of _____

Notary Seal

My Commission Expires:

CORPORATE CERTIFICATE

I, _____ certify that I am the Secretary of the Corporation named as Contractor in the foregoing Contract; that _____, who signed said Contract on behalf of the Contractor was then _____ of said Corporation; that said 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.

Secretary

Corporate Seal

GENERAL INSTRUCTIONS FOR BONDS

1. The surety on each Bond must be a responsible surety company, which is qualified to do business in Mississippi and satisfactory to the Owner.
2. The name, including full Christian name and residence of each individual party to the Bond shall be inserted in the body thereof, and each such party shall sign the Bond with his usual signature on the line opposite the seal and if signed in Maine, Massachusetts or New Hampshire an adhesive seal shall be affixed opposite the signature. The bond must be either signed or countersigned by a Mississippi Resident Agent of the Surety Company.
3. If the principals are partners, their individual names will appear in the body of the Bond with the recital that they are partners composing a firm, naming it; and all the members of the firm shall execute the Bond as individuals.
4. The signature of a witness shall appear in the appropriate place, attesting to the signature of each individual party to the Bond.
5. If the principal or surety is a corporation, the name of the State in which incorporated shall be inserted in the appropriate place in the body of the Bond, and said instrument shall be executed and attested under the corporate seal as indicated in the form. If the corporation has no corporate seal the fact shall be stated, in which case, a scroll or adhesive seal shall appear following the corporate name.
6. The official character and authority of the person or persons executing the Bond for the principal, if a corporation, shall be certified by the secretary or assistant secretary, according to the form attached hereto. In lieu of such certificate there may be attached to the Bond copies of so much of the records of the corporation as will show the official character and authority of the officer signing, duly certified by the secretary or assistant secretary, under the corporate seal, to be true copies.
7. The date of this Bond must not be prior to the date of the Contract in connection with which it is given.
8. Surety Companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the project is located.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a _____ hereinafter called Principal, and
(Corporation, Partnership, or Individual)

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto _____

(Name of Owner)

(Address of Owner)

hereinafter called OWNER, in the penal sum of _____ in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated _____ day of _____ 20 _____, a copy of which is hereto attached and made a part hereof for the construction of:

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, with or without notice to the Surety and during the one year guaranty period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

NOW, THEREFORE, if the Principal shall promptly make payment of all taxes, licenses, assignments, contributions, damages, penalties, and interest thereon, when and as the same may lawfully be due the state of Mississippi, or any county, municipality, board, department, commission, or political subdivision thereof, by reason of and directly connected with the performance of said Contract or any part thereof as provided by Sections 27-65-1, 27-65-21, 27-67-301 and 31-5-3, supra, or any other applicable statute or other authority, then this obligation shall be null and void; otherwise, it shall remain in full force and effect.

PROVIDED, FURTHER, that the said Surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any wise affect its obligation on this

00500-7

BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this statement is executed in five (5) counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20 _____.

ATTEST:

(Seal) (Principal) Secretary

By Principal

(Address)

Witness as to Principal

(Address)

ATTEST:

By

Witness as to Surety

(Address)

(Address)

NOTE: Date of BOND must not be prior to date of Contract.
If CONTRACTOR is Partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the PROJECT is located.

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS THAT

(Name of Contractor)

(Address of Contractor)

a _____ hereinafter called Principal, and
(Corporation, Partnership, or Individual)

and _____
(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto _____

(Name of Owner)

(Address of Owner)

hereinafter called OWNER, in the penal sum of _____ in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____ day of _____ 20 _____, a copy of which is hereto attached and made a part hereof for the construction of:

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, SUBCONTRACTORS, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and all insurance premiums on said WORK, and for all labor, performed in such WORK whether by SUBCONTRACTOR or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any wise affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this statement is executed in five (5) counterparts, each one of which shall

00500-9

be deemed an original, this the _____ day of _____, 20 _____.

ATTEST:

(Seal) (Principal) Secretary

By Principal

(Address)

Witness as to Principal

(Address)

ATTEST:

Surety

By _____

Witness as to Surety

(Address)

(Address)

NOTE: Date of BOND must not be prior to date of Contract.
If CONTRACTOR is Partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the PROJECT is located.

NOTICE OF AWARD

Date _____

TO: _____

RE: Tennis & Pickleball Complex
 Lamar County, Mississippi

NOTICE OF AWARD

Gentlemen:

The Owner has considered the Proposal submitted by you for the above referenced Work in response to its Advertisement for Bids and Instructions to Bidders.

You are hereby notified that your Proposal has been accepted in the amount of \$_____.

You are required by the Instruction to Bidders to execute the Contract and furnish to the Owner the required Contractor's Performance Bond, Payment Bond and certificates of insurance within 10 calendar days from the date of delivery of this Notice to you. We have enclosed five copies of the necessary contract forms and bond forms. Please return all five copies of these documents to the offices of Neel-Schaffer, 704 Hardy Street, Hattiesburg, MS 39401.

If you fail to execute said Contract and to furnish said Bonds within 10 days from the date of delivery of this Notice, the Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your proposal as abandoned and as a forfeiture of your Bid Bond. The Owner will be entitled to such other rights as may be granted by Law.

You are required by the General Conditions and Supplementary Conditions to submit to Neel-Schaffer, Inc. an estimated progress schedule, a preliminary schedule of Shop Drawing submissions and a preliminary schedule of values of the Work within 10 days after the effective date of this Contract, all in accordance with Article 2.5 of the General Conditions.

You are required to return an acknowledged copy of this Notice of Award directly to the City of Laurel, Mississippi, Attention: Mayor Johnny Magee and to Neel-Schaffer, Inc.

Sincerely,

NEEL-SCHAFFER, INC.

Russ Bryan, ASLA
Vice President | Landscape Architect Manager

ACCEPTANCE OF NOTICE

Receipt of the above Notice of Award is hereby acknowledged by _____ this, the
_____ day of _____, 20_____.

By _____

Title _____

NOTICE TO PROCEED

Date

To: _____

Attention: _____

REFERENCE: NOTICE TO PROCEED
TENNIS & PICKLEBALL COMPLEX
LAMAR COUNTY, MISSISSIPPI

Dear _____:

You are hereby notified to commence Work in accordance with the Contract dated _____, on or before _____. You are to complete the Work within _____ Working days from the effective date of this Notice to Proceed. Liquidated damages in the amount of the actual damages, costs, losses and expenses reasonably incurred by the OWNER per calendar day for each day the Work has not achieved Final Completion after _____ will be imposed unless the contract time is otherwise adjusted for due cause by change orders to the Contract. Liquidated Damages, as defined herein, will be assessed unless the Contract Time is otherwise adjusted for due cause by change order to the Contract.

The engineering firm of Neel-Schaffer, Inc. will act as the Engineer on behalf of the City of Laurel, Mississippi for the work to be performed under the contract. Russ Bryan, ASLA, of Neel-Schaffer, Inc. will be the designated representative of the Engineer.

Please return a copy of this NOTICE TO PROCEED and ACCEPTANCE OF NOTICE to the undersigned and to Neel-Schaffer, Inc., indicating your receipt of this document in the space provided below.

Sincerely,

Lamar County, Mississippi

Warren Byrd, District 2 Supervisor
Board President

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED

is hereby acknowledged by _____

this, the _____ day

of _____, 20_____.

By _____

Title _____

CONTRACT CHANGE ORDER

OWNER: _____ PROJECT NAME: _____

CONTRACTOR: _____

DATE: _____

CHANGE ORDER NUMBER: _____ CONTRACT NUMBER: _____

REASON FOR CHANGE: _____

YOU ARE HEREBY REQUESTED TO COMPLY WITH THE FOLLOWING CHANGES FROM THE CONTRACT
PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS: (USE ADDITIONAL SHEETS IF REQUIRED)

ITEM NO.	DESCRIPTION OF CHANGE(S) (QUANTITIES, ETC.)	QTY	UNIT COST	TOTAL CONTRACT
				0.00
				0.00
				0.00
				0.00
				0.00
				0.00
				0.00
				0.00
				0.00
				0.00
				0.00
				0.00

TOTAL CONTRACT CHANGE	\$
	TOTAL CONTRACT
ORIGINAL CONTRACT AMOUNT:	\$
CURRENT CONTRACT AMOUNT:	\$
THIS CONTRACT CHANGE	
REVISED CONTRACT AMOUNT:	\$
CURRENT CONTRACT COMPLETION DATE:	
TIME EXTENSION REQUIRED BY CHANGE:	
REVISED CONTRACT COMPLETION DATE:	
<p>THIS DOCUMENT SHALL BE AN AMENDMENT TO THE CONTRACT AND ALL PROVISIONS OF THE CONTRACT WILL APPLY.</p> <p>RECOMMENDED BY: _____</p> <p>ENGINEER _____ DATE _____</p> <p>NEEL-SCHAFFER, INC.</p> <p>ACCEPTED BY: _____</p> <p>CONTRACTOR _____ DATE _____</p> <p>ACCEPTED BY: _____</p> <p>OWNER _____ DATE _____</p>	

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the Controlling Law.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly By



PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
a practice division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

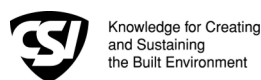
AMERICAN COUNCIL OF ENGINEERING COMPANIES

AMERICAN SOCIETY OF CIVIL ENGINEERS

This document has been approved and endorsed by



The Associated General Contractors of America



Construction Specifications Institute

Copyright ©2002

National Society of Professional Engineers
1420 King Street, Alexandria, VA 22314

American Council of Engineering Companies
1015 15th Street, N.W., Washington, DC 20005

American Society of Civil Engineers
1801 Alexander Bell Drive, Reston, VA 20191-4400

These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor Nos. C-520 or C-525 (2002 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the EJCDC Construction Documents, General and Instructions (No. C-001) (2002 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. C-800) (2002 Edition).

TABLE OF CONTENTS

	<u>Page</u>
ARTICLE 1 - DEFINITIONS AND TERMINOLOGY	6
1.01 <i>Defined Terms</i>	6
1.02 <i>Terminology</i>	8
ARTICLE 2 - PRELIMINARY MATTERS	9
2.01 <i>Delivery of Bonds and Evidence of Insurance</i>	9
2.02 <i>Copies of Documents</i>	9
2.03 <i>Commencement of Contract Times; Notice to Proceed</i>	9
2.04 <i>Starting the Work</i>	9
2.05 <i>Before Starting Construction</i>	9
2.06 <i>Preconstruction Conference</i>	9
2.07 <i>Initial Acceptance of Schedules</i>	9
ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE	10
3.01 <i>Intent</i>	10
3.02 <i>Reference Standards</i>	10
3.03 <i>Reporting and Resolving Discrepancies</i>	10
3.04 <i>Amending and Supplementing Contract Documents</i>	11
3.05 <i>Reuse of Documents</i>	11
3.06 <i>Electronic Data</i>	11
ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS	11
4.01 <i>Availability of Lands</i>	11
4.02 <i>Subsurface and Physical Conditions</i>	12
4.03 <i>Differing Subsurface or Physical Conditions</i>	12
4.04 <i>Underground Facilities</i>	13
4.05 <i>Reference Points</i>	13
4.06 <i>Hazardous Environmental Condition at Site</i>	13
ARTICLE 5 - BONDS AND INSURANCE	14
5.01 <i>Performance, Payment, and Other Bonds</i>	14
5.02 <i>Licensed Sureties and Insurers</i>	15
5.03 <i>Certificates of Insurance</i>	15
5.04 <i>Contractor's Liability Insurance</i>	15
5.05 <i>Owner's Liability Insurance</i>	16
5.06 <i>Property Insurance</i>	16
5.07 <i>Waiver of Rights</i>	17
5.08 <i>Receipt and Application of Insurance Proceeds</i>	17
5.09 <i>Acceptance of Bonds and Insurance; Option to Replace</i>	17
5.10 <i>Partial Utilization, Acknowledgment of Property Insurer</i>	18
ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES	18
6.01 <i>Supervision and Superintendence</i>	18
6.02 <i>Labor; Working Hours</i>	18
6.03 <i>Services, Materials, and Equipment</i>	18
6.04 <i>Progress Schedule</i>	18
6.05 <i>Substitutes and "Or-Equals"</i>	19
6.06 <i>Concerning Subcontractors, Suppliers, and Others</i>	20
6.07 <i>Patent Fees and Royalties</i>	21
6.08 <i>Permits</i>	21
6.09 <i>Laws and Regulations</i>	21
6.10 <i>Taxes</i>	22
6.11 <i>Use of Site and Other Areas</i>	22
6.12 <i>Record Documents</i>	22
6.13 <i>Safety and Protection</i>	22
6.14 <i>Safety Representative</i>	23
6.15 <i>Hazard Communication Programs</i>	23

6.16	<i>Emergencies</i>	23
6.17	<i>Shop Drawings and Samples</i>	23
6.18	<i>Continuing the Work</i>	24
6.19	<i>Contractor's General Warranty and Guarantee</i>	24
6.20	<i>Indemnification</i>	24
6.21	<i>Delegation of Professional Design Services</i>	25
ARTICLE 7 - OTHER WORK AT THE SITE		25
7.01	<i>Related Work at Site</i>	25
7.02	<i>Coordination</i>	26
7.03	<i>Legal Relationships</i>	26
ARTICLE 8 - OWNER'S RESPONSIBILITIES		26
8.01	<i>Communications to Contractor</i>	26
8.02	<i>Replacement of Engineer</i>	26
8.03	<i>Furnish Data</i>	26
8.04	<i>Pay When Due</i>	26
8.05	<i>Lands and Easements; Reports and Tests</i>	26
8.06	<i>Insurance</i>	26
8.07	<i>Change Orders</i>	26
8.08	<i>Inspections, Tests, and Approvals</i>	26
8.09	<i>Limitations on Owner's Responsibilities</i>	27
8.10	<i>Undisclosed Hazardous Environmental Condition</i>	27
8.11	<i>Evidence of Financial Arrangements</i>	27
ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION		27
9.01	<i>Owner's Representative</i>	27
9.02	<i>Visits to Site</i>	27
9.03	<i>Project Representative</i>	27
9.04	<i>Authorized Variations in Work</i>	27
9.05	<i>Rejecting Defective Work</i>	27
9.06	<i>Shop Drawings, Change Orders and Payments</i>	28
9.07	<i>Determinations for Unit Price Work</i>	28
9.08	<i>Decisions on Requirements of Contract Documents and Acceptability of Work</i>	28
9.09	<i>Limitations on Engineer's Authority and Responsibilities</i>	28
ARTICLE 10 - CHANGES IN THE WORK; CLAIMS		28
10.01	<i>Authorized Changes in the Work</i>	28
10.02	<i>Unauthorized Changes in the Work</i>	29
10.03	<i>Execution of Change Orders</i>	29
10.04	<i>Notification to Surety</i>	29
10.05	<i>Claims</i>	29
ARTICLE 11 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK		30
11.01	<i>Cost of the Work</i>	30
11.02	<i>Allowances</i>	31
11.03	<i>Unit Price Work</i>	31
ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES		32
12.01	<i>Change of Contract Price</i>	32
12.02	<i>Change of Contract Times</i>	33
12.03	<i>Delays</i>	33
ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK.....		33
13.01	<i>Notice of Defects</i>	33
13.02	<i>Access to Work</i>	33
13.03	<i>Tests and Inspections</i>	33
13.04	<i>Uncovering Work</i>	34
13.05	<i>Owner May Stop the Work</i>	34
13.06	<i>Correction or Removal of Defective Work</i>	34
13.07	<i>Correction Period</i>	34
13.08	<i>Acceptance of Defective Work</i>	35
13.09	<i>Owner May Correct Defective Work</i>	35
ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION		36
14.01	<i>Schedule of Values</i>	36
14.02	<i>Progress Payments</i>	36
14.03	<i>Contractor's Warranty of Title</i>	37
14.04	<i>Substantial Completion</i>	37

14.05	<i>Partial Utilization</i>	38
14.06	<i>Final Inspection</i>	38
14.07	<i>Final Payment</i>	38
14.08	<i>Final Completion Delayed</i>	39
14.09	<i>Waiver of Claims</i>	39
ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION		39
15.01	<i>Owner May Suspend Work</i>	39
15.02	<i>Owner May Terminate for Cause</i>	39
15.03	<i>Owner May Terminate For Convenience</i>	40
15.04	<i>Contractor May Stop Work or Terminate</i>	40
ARTICLE 16 - DISPUTE RESOLUTION		41
16.01	<i>Methods and Procedures</i>	41
ARTICLE 17 - MISCELLANEOUS		41
17.01	<i>Giving Notice</i>	41
17.02	<i>Computation of Times</i>	41
17.03	<i>Cumulative Remedies</i>	41
17.04	<i>Survival of Obligations</i>	41
17.05	<i>Controlling Law</i>	41
17.06	<i>Headings</i>	41

GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*--Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*--The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

3. *Application for Payment*--The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*--Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*--The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidder*--The individual or entity who submits a Bid directly to Owner.

7. *Bidding Documents*--The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. *Bidding Requirements*--The Advertisement or Invitation to Bid, Instructions to Bidders, bid security of acceptable form, if any, and the Bid Form with any supplements.

9. *Change Order*--A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*--A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*--The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*-- Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor's submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. *Contract Price*--The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*--The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any, (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. *Contractor*--The individual or entity with whom Owner has entered into the Agreement.

16. *Cost of the Work*--See Paragraph 11.01.A for definition.

17. *Drawings*--That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*--The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *Engineer*--The individual or entity named as such in the Agreement.

20. *Field Order*--A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

21. *General Requirements*--Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

22. *Hazardous Environmental Condition*--The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

23. *Hazardous Waste*--The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. *Laws and Regulations; Laws or Regulations*--Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. *Liens*--Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

26. *Milestone*--A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*--The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

28. *Notice to Proceed*--A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

29. *Owner*--The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

30. *PCBs*--Polychlorinated biphenyls.

31. *Petroleum*--Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

32. *Progress Schedule*--A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

33. *Project*--The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

34. *Project Manual*--The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

35. *Radioactive Material*--Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

36. *Related Entity* -- An officer, director, partner, employee, agent, consultant, or subcontractor.

37. *Resident Project Representative*--The authorized representative of Engineer who may be assigned to the Site or any part thereof.

38. *Samples*--Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

39. *Schedule of Submittals*--A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

40. *Schedule of Values*--A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

41. *Shop Drawings*--All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

42. *Site*--Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

43. *Specifications*--That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain

administrative requirements and procedural matters applicable thereto.

44. *Subcontractor*--An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

45. *Substantial Completion*--The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

46. *Successful Bidder*--The Bidder submitting a responsive Bid to whom Owner makes an award.

47. *Supplementary Conditions*--That part of the Contract Documents which amends or supplements these General Conditions.

48. *Supplier*--A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or any Subcontractor.

49. *Underground Facilities*--All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

50. *Unit Price Work*--Work to be paid for on the basis of unit prices.

51. *Work*--The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

52. *Work Change Directive*--A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times

but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 Terminology

A. The following words or terms are not defined but, when used in the Bidding Requirements or Contract Documents, have the following meaning.

B. Intent of Certain Terms or Adjectives

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action or determination will be solely to evaluate, in general, the Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. Day

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. Defective

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

- a. does not conform to the Contract Documents, or
- b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents, or
- c. has been damaged prior to Engineer's - recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. Furnish, Install, Perform, Provide

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 - PRELIMINARY MATTERS

2.01 Delivery of Bonds and Evidence of Insurance

A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 Copies of Documents

A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 Commencement of Contract Times; Notice to Proceed

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement

or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 Starting the Work

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 Before Starting Construction

A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule; indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 Preconstruction Conference

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.07 Initial Acceptance of Schedules

A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or

responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, or Engineer, or any of, their Related Entities, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. Reporting Discrepancies

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor may discover and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor knew or reasonably should have known thereof.

B. Resolving Discrepancies

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

a. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work

(unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;

2. Engineer's approval of a Shop Drawing or Sample; (Subject to the provisions of Paragraph 6.17.D.3); or

3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier or other individual or entity performing or furnishing all of the Work under a direct or indirect contract with Contractor, shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or Engineer's consultants, including electronic media editions; or

2. reuse any of such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaption by Engineer.

B. The prohibition of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

A. Copies of data furnished by Owner or Engineer to Contractor or Contractor to Owner or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's

sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party..

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Contract Documents; and

2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Contract Documents.

B. *Limited Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice*: If Contractor believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. Possible Price and Times Adjustments

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

c. Contractor failed to give the written notice as required by Paragraph 4.03.A.

3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, Owner and Engineer, and any of their Related Entities shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

- a. reviewing and checking all such information and data,
- b. locating all Underground Facilities shown or indicated in the Contract Documents,
- c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction, and
- d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will

promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the Engineer in the preparation of the Contract Documents.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered to Contractor written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to

entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06. G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 - BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified

in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent must be accompanied by a certified copy of the agent's authority to act.

C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. Contractor shall deliver to Owner, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

B. Owner shall deliver to Contractor, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

5.04 *Contractor's Liability Insurance*

A. Contractor shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection

from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insured (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include completed operations insurance;

4. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

6. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment.

a. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, (other than caused by flood) and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.

B. Owner shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any

deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insured or additional insured (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.

B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract

Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances. The superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or

received from the superintendent shall be binding on Contractor.

6.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole,

3) it has a proven record of performance and availability of responsive service; and

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times, and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. Substitute Items

a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented in the General Requirements and as Engineer may decide is appropriate under the circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

1) shall certify that the proposed substitute item will:

a) perform adequately the functions and achieve the results called for by the general design,

b) be similar in substance to that specified, and

c) be suited to the same use as that specified;

2) will state:

a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time;

b) whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and

c) whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

3) will identify:

a) all variations of the proposed substitute item from that specified, and

b) available engineering, sales, maintenance, repair, and replacement services;

4) and shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change,

B. Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. Engineer's Evaluation: Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

D. Special Guarantee: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

E. Engineer's Cost Reimbursement: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the charges of Engineer for making changes in the Contract

Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

F. Contractor's Expense: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity, nor

2. shall anything in the Contract Documents create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual

or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of Owner or Engineer its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 Taxes

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 Use of Site and Other Areas

A. Limitation on Use of Site and Other Areas

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

B. Removal of Debris During Performance of the Work: During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. Cleaning: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. Loading Structures: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 Record Documents

A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 Safety and Protection

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Draw-

ings or Specifications or to the acts or omissions of Owner or Engineer or , or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

D. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the acceptable Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. Shop Drawings

a. Submit number of copies specified in the General Requirements.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples*: Contractor shall also submit Samples to Engineer for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals.

a. Submit number of Samples specified in the Specifications.

b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals , any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. Submittal Procedures

1. Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:

a. all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

b. the suitability of all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;

c. all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto; and

d. shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents

with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations, that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawing's or Sample Submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. Engineer's Review

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. Resubmittal Procedures

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 Continuing the Work

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or

disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 Contractor's General Warranty and Guarantee

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its Related Entities shall be entitled to rely on representation of Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or

7. any correction of defective Work by Owner.

6.20 Indemnification

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or

arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .

B. In any and all claims against Owner or Engineer or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal

shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 - OTHER WORK AT THE SITE

7.01 *Related Work at Site*

A. Owner may perform other work related to the Project at the Site with Owner's employees, or via other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and

2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and

properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.

B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's actions or inactions.

C. Contractor shall be liable to Owner and any other contractor for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's action or inactions.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

A. Owner's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by Engineer in preparing the Contract Documents.

8.06 *Insurance*

A. Owner's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility in respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. If and to the extent Owner has agreed to furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents, Owner's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents and will not be changed without written consent of Owner and Engineer.

9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep

Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believe that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show

partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to, the Resident Project Representative, if any, and assistants, if any.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall

promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.B.

10.03 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any bond to be given to a surety, the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

B. *Notice:* Written notice stating the general nature of each Claim, shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part,

2. approve the Claim, or

3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in Paragraph 11.01.B.

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and

Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to Engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have

resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expresses, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. Costs Excluded: The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A and 11.01.B.

C. Contractor's Fee: When all the Work is performed on the basis of cost-plus, Contractor's fee shall

be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. Documentation: Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 Allowances

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. Cash Allowances

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. Contingency Allowance

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 Unit Price Work

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

2. there is no corresponding adjustment with respect any other item of Work; and

3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an

allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted

by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer and the Related Entities of each of them shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of Engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. All defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's Site safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in said Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to

be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation.

F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.

D. If, the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

A. Promptly after receipt of notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or
2. correct such defective Work; or
3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications .

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress

payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. Applications for Payments

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. Review of Applications

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations on the Site of the executed Work as an experienced and qualified design professional and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and to any other qualifications stated in the recommendation); and

c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or

b. that there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

a. to supervise, direct, or control the Work, or

b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent

inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
- b. the Contract Price has been reduced by Change Orders;
- c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
- d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. Reduction in Payment

1. Owner may refuse to make payment of the full amount recommended by Engineer because:

- a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
- b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
- c. there are other items entitling Owner to a set-off against the amount recommended; or
- d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor corrects to Owner's satisfaction the reasons for such action.

3. If it is subsequently determined that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1.

14.03 Contractor's Warranty of Title

A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 Substantial Completion

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

B. Promptly after Contractor's notification, , Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will within 14 days after submission of the tentative certificate to Owner notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will within said 14 days execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial

Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions.

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor will certify to Owner and Engineer that such part of the Work is substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals

that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. Application for Payment

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.7;

b. consent of the surety, if any, to final payment;

c. a list of all Claims against Owner that Contractor believes are unsettled; and

d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner or Owner's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Engineer's Review of Application and Acceptance*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations

under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and , will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance

with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor's disregard of the authority of Engineer; or

4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion),

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and

3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B, and 15.02.C.

15.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 - DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be

governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions, or

2. agrees with the other party to submit the Claim to another dispute resolution process, or

3. gives written notice to the other party of their intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 - MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

SUPPLEMENTARY CONDITIONS

CONTENTS

1.	Definitions	00800-2
2.	Commencement of Contract Time: Notice to Proceed	00800-2
3.	Before Starting Construction	00800-2
4.	Preconstruction Conference	00800-2
5.	Subsurface and Physical Conditions	00800-2
6.	Insurance Requirements	00800-3
7.	Contractor's Responsibilities	00800-5
8.	Record Documents	00800-5
9.	Limitations on ENGINEER'S Responsibilities	00800-5
10.	Change of Contract Time	00800-5
11.	Payments to CONTRACTOR	00800-6
12.	List of Contract Drawings	00800-7
13.	Liquidated and Special Damages	00800-7
14.	Suspension of Work and Termination	00800-7

SUPPLEMENTARY CONDITIONS

1. Definitions

- A. The definition of "Technical Specifications" shall be the same as the definition for Specifications stated in Paragraph 1.01 under item number 43 of the General Conditions.
- B. Delete Paragraph 1.01.A.12 of the General Conditions in its' entirety.
- C. In Paragraph 1.01A.52 delete the following words, "or responding to differing or unseen subsurface or physical conditions under which the work is to be performed or to emergencies."

2. Commencement of Contract Time: Notice to Proceed

The commencement of Contract Time, as stated in Item 2.03 of the General Conditions is changed to read," The Contract Time will commence to run within the sixtieth day after the Effective Date of the Agreement, or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed; but in no event shall the Contract Time commence to run later than the sixtieth day after the Effective Date of the Agreement."

Notice to Proceed may be given at any time within sixty days after the Effective Date of the Agreement. Refer to Item 21 of the Instructions to Bidders regarding execution of the Contract.

3. Before Starting Construction

In addition to the requirements of Paragraph 2.05 of the General Conditions, "**CONTRACTOR** shall deliver to the **OWNER**, with his signed Contract, all bonds and insurance which he is required to purchase and maintain in accordance with Article 5 of the General Conditions. A copy shall also be submitted to the **ENGINEER**. The **OWNER** shall deliver to the **CONTRACTOR** a copy of all policies of insurance which the **OWNER** is required to purchase and maintain in accordance with Article 5 of the General Conditions."

4. Preconstruction Conference

The time period for holding the preconstruction conference as stated in Paragraph 2.06 of the General Conditions shall be within 30 days after the Effective date of the Agreement, but before the **CONTRACTOR** starts the Work at the site.

5. Subsurface and Physical Conditions

Paragraphs 4.02 and 4.03 shall be deleted in its' entirety and replaced with the following:

DIFFERING SITE CONDITIONS PROVISION:

Execution of this Contract (Agreement) by the Contractor is a representation that the Contractor has visited the site, that general and local conditions are suitable for the work to be performed and that the Contractor accepts all conditions at the Project site. The Contractor assumes all risks with respect to the requirements of the Contract Documents, including without limitation the characteristics (natural and manmade) of the site, site accessibility, labor rates and availability, weather conditions, and any other matter that could affect the performance and cost of the work.

6. Insurance Requirements

- A. Paragraphs 5.05 and 5.06 shall be deleted in their entirety.
- B. Paragraphs 5.07.B, 5.07.B.1 and 5.07.B.2 shall be deleted in their entirety.
- C. In addition to the requirements of Article 5 of the General Conditions, insurance coverage specified herein constitutes the minimum requirements and said requirements shall in no way lessen or limit the liability of the **CONTRACTOR** under the terms of the Contract. The **CONTRACTOR** shall procure and maintain at his own expense any additional kinds and amounts of insurance that, in his own judgment, may be necessary for his proper protection in the prosecution of the Work.
 - 1. The **CONTRACTOR** shall carry insurance as prescribed herein and all policies shall be with companies satisfactory to the **OWNER**. If a part of this Contract is sublet, the **CONTRACTOR** shall require each Subcontractor to carry insurance of the same kinds and in like amounts as carried by the **CONTRACTOR**, including all additional insureds and waivers of subrogation.
 - 2. Certificates of insurance shall state that 30 days written notice will be given to the **OWNER** before the policy is canceled or changed. No **CONTRACTOR** or Subcontractor will be allowed to start any construction work on this Contract until certificates of all insurance required herein and all coverage requirements specified in contract documents are filed with and approved by the **OWNER**. The certificates shall show the type, amount, class of operations covered, effective dates and the dates of expiration of policies.
 - 3. The **CONTRACTOR** shall secure and maintain in effect for the period of the **CONTRACT** and pay all premiums for the following kinds and amounts of insurance:
 - a. Worker's Compensation and Employer's Liability Insurance: This insurance shall protect the **CONTRACTOR** against all claims under applicable State Worker's Compensation Laws. The **CONTRACTOR** shall also be protected and shall cause each Subcontractor to be protected against claims for injury, disease, or death of employees, which for any reason, may not fall within the provisions of a Worker's Compensation Law. The liability limits shall not be less than the required statutory limits for Worker's Compensation and Employer's Liability limits in the amount of ONE MILLION DOLLARS (\$1,000,000.00). **CONTRACTOR** and subcontractors shall supply **OWNER** endorsements from their carriers evidencing waiver of subrogation in favor of the **OWNER**.
 - b. **CONTRACTOR'S** and Subcontractor's Comprehensive General Liability Insurance, including bodily injury, property damage, contractual and other

standard coverage contained in Comprehensive General Liability Insurance, in an amount of not less than ONE MILLION DOLLARS (\$1,000,000) per occurrence and aggregate. **OWNER** shall be provided an endorsement naming the **OWNER** as an insured from the insurer for the work contracted. The Comprehensive General Liability policies carried by both the **CONTRACTOR** and the Subcontractors shall contain an endorsement to include the coverage of the following hazards:

- i. Explosion, collapse, and underground property damage to include any damage or destruction of property below the surface of the ground, such as wires, conduits, pipes, mains, sewers, etc., caused by the **CONTRACTOR'S** operations.
 - ii. The collapse of and structural injury to any building, structure or property on or adjacent to the **OWNER'S** premises or right-of-way caused by the **CONTRACTOR'S** operations in the removal of other buildings, structures, or supports, or by excavation below the surface of the ground.
 - iii. Contractual Liability Coverage for the Hold Harmless segments of the Contract Documents.
- c. **CONTRACTOR'S** Contingent or Protective Liability and Property Damage: In case part of this Contract is sublet, the **CONTRACTOR** shall secure contingent or protective liability and property damage insurance to protect the **CONTRACTOR** from any and all claims arising from the operation of Subcontractors in the execution of Work included in the Contract. In no case shall the amount of such protection be less than the limits of \$500,000/\$1,000,000 for Public Liability Insurance and \$500,000/\$1,000,000 for Property Damage Insurance. The coverage in each case shall be acceptable to the **OWNER**.
- d. Auto Liability: The **CONTRACTOR** shall maintain Auto Liability Insurance in the amount of not less than ONE MILLION DOLLARS (\$1,000,000) Combined Single Limit to protect him from any and all claims arising from the use of the following:
- i. **CONTRACTOR'S** own automobiles and trucks.
 - ii. Hired and non-owned automobiles and trucks.
 - iii. Automobiles and trucks owned by Subcontractors.
- The aforementioned is to cover use of automobiles and trucks on and off the site of the Project. The **OWNER** shall be provided an endorsement from the insurer naming the **OWNER** as an insured for the work contracted.
- e. **OWNER'S** Protective Liability Policy: The **CONTRACTOR** shall maintain **OWNER'S** Protective Liability Insurance with the **OWNER** as the named insured, and the **ENGINEER**, and their servants, agents and employees as additional insureds, in an amount not less than ONE MILLION DOLLARS (\$1,000,000).
- f. Umbrella Liability: The **CONTRACTOR** shall provide **OWNER** a certificate of insurance evidencing Umbrella Liability Insurance in the amount of not less than TWO MILLION DOLLARS (\$2,000,000).
- g. Builder's Risk and Boiler and Machinery Insurance: The **CONTRACTOR** shall purchase and maintain Builder's Risk and Boiler and Machinery Insurance in the amount of the total value of the materials necessary for the

project. A certificate evidencing such coverage shall be on file with the **OWNER**.

h. Property Insurance: No property insurance is required for this project.

7. Contractor's Responsibilities

Delete Paragraph 6.02.B in its' entirety.

8. Record Documents

In addition to the requirements of Paragraph 6.12 of the General Conditions, **CONTRACTOR** shall provide accurate 'mark-ups' acceptable to the **ENGINEER** on or before the date of Substantial Completion of the Project for use by the **ENGINEER** in the preparation of 'record' drawings. Final payment will not be made to the **CONTRACTOR** prior to the **ENGINEER** receiving these mark-ups from the **CONTRACTOR**.

9. Limitations on ENGINEER'S Responsibilities

In addition to the requirements of Paragraph 9.09.B, when it comes to his attention, the **ENGINEER** will immediately notify the **OWNER** in the event that the **CONTRACTOR** is not complying with the Contract Documents or is conducting the Work in such a manner that could be considered grounds for termination of the Contract. The **CONTRACTOR** shall retain responsibility for performing all Work in compliance with the Contract Documents.

The following language shall be added to Paragraph 9.09.B:

“Consistent with the express provisions of this Section 00700, Article 6.13, Article 6.17.D.2, Article 9.02.B, Article 9.09, this Article 9.09.B, and Article 14.02.B.4.b, any reference to “safety” elsewhere in this contract, including but not limited to those found in Section 00700, Articles 4.02.B.1, 4.04.A.2.d, 4.04.B.1, 4.06.B.1, 6.02.B, 6.14, 6.15, 6.16, 6.17.C.1.c, and 13.02.A, does not impose upon the Engineer any duty, obligation or other contractual undertaking to administer the “safety” aspects of Contractor’s performance, or any other matter relating to the Contractor’s means, methods, techniques, sequences or procedures. Contractor’s contractual safety obligations and means and methods during construction are the sole responsibility of the Contractor and are not being administered, overseen or reviewed in any way by the Engineer in performing its contractual obligations”

10. Change of the Contract Time

In addition to the requirements of Paragraph 12.03 of the General Conditions, rainstorms which are encountered in the project area on a regular and seasonal basis do not constitute an abnormal weather condition.

Determining regular and seasonal rainfall amounts is based on historical rainfall data for events greater than 0.10 inches. Rainfall amounts less than 0.10 inches are not considered as an impact to construction activities. The following table provides the 20-year historical average from the NOAA website which will be considered as regular and seasonal rainfall for the project area.

Historical Rainfall Data												
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Average Rain Days (>0.1in.)	6	6	6	5	5	7	7	7	5	3	4	7

The frequency of rainfall having an amount greater than 0.10 inches must exceed the averages shown in the table to be considered as abnormal.

11. Payments to **CONTRACTOR**

Paragraph 14.02, Application for Payments, is deleted in its' entirety and the following substituted therefore:

- A. Monthly Estimates and Partial Payments: The **CONTRACTOR'S** partial payment period shall end on the last day of each month. The **CONTRACTOR** shall submit acceptable Application for Payment to the **ENGINEER** by the date indicated on the payment schedule as supplied to **CONTRACTOR** by **ENGINEER** provided that the amount due on completed work is at least \$500.00. The partial payment request shall be filled out and signed by the **CONTRACTOR** covering the work completed as of the date of the request and accompanied by such supporting documentation as is required by the Contract Documents and also as the **ENGINEER** may reasonably require. At the discretion of the **OWNER**, the **ENGINEER** may be authorized to include in any monthly estimate advances covering approximately 95 percent of the value of unused materials delivered and stored on the site of the work. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the site, the Application for Payment shall also be accompanied by such data, satisfactory to **OWNER**, as will establish **OWNER'S** title to the material and equipment and protect **OWNER'S** title to the material and equipment and protect **OWNER'S** interest therein, including applicable insurance. Each subsequent Application for Payment shall include an affidavit of **CONTRACTOR** stating that all previous progress payments received on account of the Work have been applied to discharge in full all of **CONTRACTOR'S** obligations reflected in prior Applications for Payment.
- B. After each monthly estimate has been approved, the **OWNER** shall pay to the **CONTRACTOR** 95 percent of the amount of said estimate. From the total value of each estimate there will be deducted an amount equivalent to 5 percent of the whole as a retainage to be held by the **OWNER**. The monthly estimates will be approximate only and subject to correction in any subsequent estimate rendered following discovery of the error. At the discretion of the **OWNER**, the **ENGINEER** may be authorized to include any monthly advances covering approximately 95 percent of the value of unused materials delivered and stored on the site of the work.
- C. Subsequent to discovery of any defective or questionable work, an amount equal to the estimated value of such work will be deducted from the next current estimate. The sum will not be included in a subsequent estimate until the defects have been remedied to the **ENGINEER'S** satisfaction.

-
- D. The **OWNER** reserves the right to withhold payment of any monthly estimate that becomes due if, in the opinion of the **OWNER'S** Attorney, such action is warranted because of any breach of the Contract Provisions or malfeasance on the part of the **CONTRACTOR** or because the progress or the quality of the work is unsatisfactory and does not comply with the Plans and Specifications.
- E. For construction contracts over \$250,000.00, the **CONTRACTOR** may, at his option, withdraw the 50 percent of the retainage after 50 percent of the work has been completed, as approved by the **ENGINEER**, provided retainage be withheld at 2.5 percent for the remainder of the project. Retainage will be withheld at a rate of 5 percent until final completion for construction contracts under \$250,000.00.

Paragraph 14.02.C of the General Conditions is modified to read "60 days after presentation of the Application for Payment to **OWNER** with **ENGINEER'S** recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by **OWNER** to **CONTRACTOR**."

Paragraph 14.07.C of the General Conditions is modified to read, "If the Application and accompanying documentation are appropriate as to form and substance, **OWNER** shall, within 60 days after receipt thereof, pay **CONTRACTOR** the amount recommended by **ENGINEER**."

Delete Paragraph 14.09.A.2 in its' entirety.

12. List of Contract Drawings: Not Used.
13. Liquidated and Special Damages

The **CONTRACTOR** will be subject to liquidated damages in the amount of \$500 per day for each consecutive calendar day beyond the Contract Time. In addition, the Contractor agrees to pay the actual damages incurred by the Owner for each consecutive calendar day after the time stipulated for Final Completion of the work. These actual costs include, but are not limited to engineering, inspection, and other construction related costs resulting from the Contractor's failure to complete the work on schedule.

14. Suspension of Work and Termination

In Paragraph 15.04.A delete the following words: "or Engineer fails to act on any Application for Payment within thirty days, after it is submitted" and add the words "if the". In Paragraph 15.04.B delete the following words: "if Engineer has failed to act on an Application for Payment within thirty days after it is submitted" and add the words "if the".

*** * END OF SECTION * ***

SECTION 01010
SUMMARY OF WORK

PART 1 GENERAL

1.01 Location of Work

All of the work of this Contract is located in public right-of-way or on easements and property owned or obtained by the Owner.

1.02 Work to be Done

- A. The CONTRACTOR shall furnish all labor, materials, equipment, tools, services and incidentals to complete all work required by these Specifications and as shown on the Drawings.
- B. The CONTRACTOR shall perform the work complete, in place, and ready for continuous service, and shall include repairs, testing, permits, cleanup, replacements and restoration required as a result of damages caused during this construction.
- C. All materials, equipment, skills, tools and labor which are reasonably and properly inferable and necessary for the proper completion of the work in a substantial manner and in compliance with the requirements stated or implied by these Specifications or Drawings shall be furnished and installed by the CONTRACTOR without additional compensation, whether specifically indicated in the Contract Documents or not.
- D. The CONTRACTOR shall comply with all county, state, federal, and other codes which are applicable to the proposed construction work.

1.03 General Description of Work to be Performed

- A. The Work included in the Contract shall be as described in the Contract Documents.
- B. All work shall be done as described in the Specifications and as shown on the Drawings, complete, tested and ready for operation.

1.04 Work Sequence

- A. All work to be done under the Contract shall be done with minimum inconvenience to the OWNER. The CONTRACTOR shall coordinate his work with private property owners such that existing drainage, water service, sewer service and garbage pickup and other public services are maintained at all times.
- B. Construct Work in stages to accommodate the OWNER'S use of the premises during the construction period; coordinate the construction schedule and operations with the ENGINEER.
- C. Construct the Work in stages to provide for public convenience. Do not close off public

access until completion of one stage of construction will provide alternative usage.

1.05 Construction Areas

- A. CONTRACTOR shall limit his use of the construction areas for Work and for storage, to allow for:
 - 1. Work by other contractors.
 - 2. OWNER use.
 - 3. Public use.
- B. Coordinate use of work site under direction of ENGINEER.
- C. Assume full responsibility for the protection, security and safekeeping of products under this Contract stored on the site.
- D. Move any stored products, under CONTRACTOR'S control which interfere with operations of the OWNER or other contractors.
- E. Obtain and pay for the use of additional storage or work areas needed for operations.

1.06 Owner Occupancy

- A. OWNER will have full access to and use of all existing sewer facilities during the entire period of construction for the conduct of his normal operations. Cooperate with ENGINEER in all construction operations to minimize conflict and to facilitate OWNER usage.
- B. CONTRACTOR shall at all times conduct his operations as to insure the least inconvenience to the general public.

1.07 Partial Owner Occupancy

The CONTRACTOR shall schedule his operations for completion of portions of the Work, as designated, for the OWNER'S occupancy prior to Substantial Completion of the entire Work.

1.08 Plans and Specifications

- A. Specifications: The Technical Specifications consist of three parts: General, Products, and Execution. The General section contains general requirements which govern the work. The Products and Execution sections modify and supplement these by detailed requirements of the work and shall always govern whenever there appears to be a conflict.
- B. Intent:
 - 1. All work called for in the Specifications applicable to the Contract but not shown on the Plans in their present form or vice versa shall be of like effect as if shown or mentioned in both. Work not specified in either the Plans or in the Specifications but involved in carrying out their intent or in the complete and proper execution of the work is required and shall be performed by the CONTRACTOR as though it were specifically delineated or described at the CONTRACTOR'S expense.
 - 2. The apparent silence of the Specifications as to any detail, or the apparent omission

from them of a detailed description concerning any work to be done and materials to be furnished, shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used, and interpretation of these Specifications shall be made upon that basis.

- C. Conflict between Drawings and Specifications. Where an obvious conflict exists between the Plans and Specifications, the ENGINEER shall decide which governs and the CONTRACTOR shall comply with the decision. Such decision shall not be grounds for additional payment to the CONTRACTOR, i.e., the CONTRACTOR shall include the price of the most expensive alternative in his bid.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

**** END OF SECTION ****

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 Description

- A. CONTRACTOR shall furnish all labor, materials, tools, equipment, appurtenances and all services necessary to perform all Work required, at the lump sum or unit prices for the items listed herein.
- B. The items listed below beginning with Article 1.04, refer to and are the same pay items listed in the Proposal. They constitute all of the pay items for the completion of the Contract. No direct or separate payment will be made for providing miscellaneous temporary or accessory works, plant, services, CONTRACTOR'S or ENGINEER'S field offices, layout surveys, job signs, sanitary requirements, testing, safety devices, approval and record drawings, water supplies, power, removal of waste, watchmen, bonds, insurance, and all other requirements of the Contract Documents. Compensation for all such services, things and materials shall be included in the prices stipulated for the lump sum and unit pay items listed herein.

1.02 Engineer's Estimate of Quantities

The ENGINEER's estimated quantities for unit bid prices, as listed in the Bid Form, are approximate only and are included solely for the purpose of comparison of Bids. The OWNER does not expressly or by implication agree that the nature of the materials encountered below the surface of the ground or the actual quantities of material encountered or required will correspond therewith and reserves the right to increase or decrease any quantity or to eliminate any quantity as OWNER may deem necessary.

1.03 Related Provisions Specified Elsewhere

- A. Payments to CONTRACTOR: Refer to General Conditions and Supplemental Conditions.
- B. Changes in Contract Price: General Conditions and Contract Forms.
- C. Schedule of Values: Section 01026.

1.04 Base Bid Items

Item 1.0 – Excess Excavation:

- 1. Description and Measurement: This item shall include all work associated with excavating and transporting, placing and excess material. The quantity for excess material shall be measured for payment as LVM (loose vehicle measure).
- 2. Payment: Payment for this item shall be made at the unit price indicated in the Prices Bid Table per cubic yard (LVM) of material installed and accepted.

Item 2.0 – Unclassified Material:

1. Description and Measurement: This item shall include all work associated with furnishing, placing and compacting unclassified material. The quantity for unclassified material shall be measured for payment on as (LVM) loose vehicle measure.
2. Payment: This item shall be paid for at the unit price indicated in the Prices Bid Table per cubic yard (LVM) of material installed and accepted.

Item 3.0 – Borrow Material:

3. Description and Measurement: This item shall include all work associated with furnishing, placing and compacting borrow material. The quantity for borrow material shall be measured for payment on as (LVM) loose vehicle measure.
4. Payment: This item shall be paid for at the unit price indicated in the Prices Bid Table per cubic yard (LVM) of material installed and accepted.

Item 4.0 – Site Grading:

1. Description: This item shall include all work required to perform site grading in the called for disturbance in the plans.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the Prices Bid Table per square yard installed and accepted.

Item 5.0 – Erosion Control:

1. Description: This item shall include all labor, materials, equipment and incidentals required for installation and maintenance of erosion control throughout the duration of the project. All items required by the approved permit or specified in the contract documents or as directed by the engineer and shall be removed upon completion of the project.
2. Measurement and Payment: Lump Sum Payment for this item shall be at the unit price indicated in the Prices Bid Table.

Item 6.0 – Grassing:

1. Description and Measurement: This item shall include all work associated with establishing a temporary and permanent stand of grass as noted in the drawings and specifications to address a reasonable disturbed area.
2. Measurement and Payment: Payment for this item shall be made at the unit price indicated in the Prices Bid Table per acre of material installed and accepted.

Item 7.0 – Post Tension Concrete Slab, 4” Thickness (Includes Net Post Footings):

1. Description: This item shall include all labor, materials, equipment, and incidentals required for installation of post tension concrete slab as shown and specified including, but not limited to fine grading, formwork, joints, sealants, curing, finishing, and installing net post footings.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the Prices Per Bid Table per square yard of post tension concrete installed and accepted.

Item 8.0 – Acrylic Surfacing, Medium Texture, 2 Colors (2 Coats Each Color):

1. Description: This item shall include all labor, materials, equipment, and incidentals required for installation of acrylic surfacing as shown and specified.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the Prices Per Bid Table per square yard of acrylic surfacing installed and accepted.

Item 9.0 – Tennis Line Paint, Per Court:

1. Description: This item shall include all labor, materials, equipment and incidentals required for installation of painted tennis markings as shown and specified.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the prices Bid Table per each tennis court installed and accepted.

Item 10.0 – Pickleball Line Paint, Per Court:

1. Description: This item shall include all labor, materials, equipment and incidentals required for installation of painted pickleball markings as shown and specified.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the prices Bid Table per each pickleball court installed and accepted.

Item 11.0 – Net & Net Posts (Pickleball):

1. Description: This item shall include all labor, materials, equipment and incidentals required for installation of the net and net posts for pickleball as shown and specified.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the prices Bid Table per each set per court installed and accepted.

Item 12.0 – Net & Net Posts (Tennis):

1. Description: This item shall include all labor, materials, equipment and incidentals required for installation of the net and net posts for tennis as shown and specified.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the prices Bid Table per each set per court installed and accepted.

Item 13.0 – Concrete Sidewalk, 4” Thickness:

1. Description: This item shall include all labor, materials, equipment, and incidentals required for installation of concrete sidewalk as shown and specified including, but not limited to fine grading, formwork, joints, sealants, curing, and finishing.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the Prices Per Bid Table per square yard of concrete sidewalk installed and accepted.

Item 14.0 – Artificial Turf (Turf, Cooling Infill, Stone Base, & Drainage):

1. Description: This item shall include all labor, materials, equipment, and incidentals required for installation of artificial turf as shown and specified including, but not limited to fine grading, formwork, joints, sealants, curing, and

-
2. finishing.
Measurement and Payment: This item shall be paid for at the unit price indicated in the Prices Per Bid Table per square feet of artificial turf installed and accepted.

Item 15.0 – Stair 1:

1. Description: This item shall include all labor, materials, equipment, and incidentals required for the construction of the concrete Stair 1 as shown on the plans.
2. Measurement and Payment: Lump Sum Payment for this item shall be at the unit price indicated in the Prices Bid Table.

Item 16.0 – Stair 2:

1. Description: This item shall include all labor, materials, equipment, and incidentals required for the construction of the concrete Stair 2 as shown on the plans.
2. Measurement and Payment: Lump Sum Payment for this item shall be at the unit price indicated in the Prices Bid Table.

Item 17.0 – Handrail:

1. Description: This item shall include all work required for installation of the handrails as shown on the plans.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the Prices Bid Table per linear foot of handrail installed and accepted.

Item 18.0 – Fencing, 10' Black Vinyl Chain Link:

1. Description: This item shall include all labor, materials, equipment and incidentals required for installation of the fencing as shown on the plans.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the Prices Bid Table per linear foot of fencing installed and accepted.

Item 19.0 – Fencing, 6' Black Vinyl Chain Link:

1. Description: This item shall include all labor, materials, equipment and incidentals required for installation of the fencing as shown on the plans.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the Prices Bid Table per linear foot of fencing installed and accepted.

Item 20.0 – Fencing, 4' Black Vinyl Chain Link:

1. Description: This item shall include all labor, materials, equipment and incidentals required for installation of the fencing as shown on the plans.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the Prices Bid Table per linear foot of fencing installed and accepted.

Item 21.0 – Gates, Black Vinyl Chain Link (Single):

1. Description: This item shall include all labor, materials, equipment and incidentals required for installation of the black vinyl chain link gates (single) as shown on the

-
- plans.
 2. Measurement and Payment: This item shall be paid for at the unit price indicated in the Prices Bid Table per each gate installed and accepted.

Item 22.0 – Fencing, 6’ Decorative Aluminum:

1. Description: This item shall include all labor, materials, equipment, and incidentals required for installation of the 6’ decorative aluminum fencing as shown on the plans.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the Prices Bid Table per linear foot of fencing installed and accepted.

Item 23.0 – Gates, 6’ Decorative Aluminum (Double):

1. Description: This item shall include all labor, materials, equipment and incidentals required for installation of the 6’ decorative aluminum gates (double) as shown on the plans.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the Prices Bid Table per each gate installed and accepted.

Item 24.0 – Gates, 4’ Decorative Aluminum (Double):

1. Description: This item shall include all labor, materials, equipment and incidentals required for installation of the 4’ decorative aluminum gates (double) as shown on the plans.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the Prices Bid Table per each gate installed and accepted.

Item 25.0 – Wind Fabric:

1. Description: This item shall include all labor, materials, equipment and incidentals required for installation of wind fabric as shown on the plans.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the Prices Bid Table per square foot of wind fabric installed and accepted.

Item 26.0 – Small Shade Shelter:

1. Description: This item shall include all labor, materials, equipment, and incidentals required for the construction of the small shade shelters as shown on the plans.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the Prices Bid Table per each small shade shelter installed and accepted.

Item 27.0 – Large Shade Shelter:

1. Description: This item shall include all labor, materials, equipment, and incidentals required for the construction of the large shade shelters as shown on the plans.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the Prices Bid Table per each large shade shelter installed and accepted.

Item 28.0 – Bleacher:

1. Description: This item shall include all labor, materials, equipment, and incidentals required for the construction of the bleachers as shown on the plans.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the Prices Bid Table per each bleacher installed and accepted.

Item 29.0 – Bench:

1. Description: This item shall include all labor, materials, equipment, and incidentals required for the construction of the benches as shown on the plans.
2. Measurement and Payment: This item shall be paid for at the unit price indicated in the Prices Bid Table per each bench installed and accepted.

Item 30.0 – Electrical & Lighting – Foundations, Conduit & Controls:

1. Description: This item shall include all labor, materials, equipment, and incidentals required for the installation of the lighting foundations, conduit, and controls as shown on the plans.
2. Measurement and Payment: Lump Sum Payment for this item shall be at the unit price indicated in the Prices Bid Table.

Item 31.0 – Water Service:

1. Description: This item shall include all labor, materials, equipment, and incidentals required for the installation of the water service as shown on the plans.
2. Measurement and Payment: Lump Sum Payment for this item shall be at the unit price indicated in the Prices Bid Table.

Item 32.0 – Sanitary Sewer Service:

1. Description: This item shall include all labor, materials, equipment, and incidentals required for the installation of the sanitary sewer service as shown on the plans.
2. Measurement and Payment: Lump Sum Payment for this item shall be at the unit price indicated in the Prices Bid Table.

Item 33.0 – Mobilization:

1. Description, Measurement and Payment: The lump sum payment for this item will be full compensation for providing all initial services, bonds, insurance, temporary facilities and required job mobilization to commence the Work as specified and the removal of all on-site facilities upon completion of the work. Payment for mobilization shall be made on the first two Pay Estimates at a rate of 50% each.

Item 34.0 – Construction Stakes:

1. Description: This item shall include all work required for staking as provided in the contract.
2. Measurement and Payment: The lump sum payment for this item will be made at the unit price indicated in the Prices Bid Table.

1.05 Additive Alternate 1 Items

Item A1 – Electrical & Lighting – Poles, Fixtures & Wiring:

1. Description: This item shall include all labor, materials, equipment, and incidentals required for the installation of the poles, fixtures, and wiring as shown on the plans.
2. Measurement and Payment: Lump Sum Payment for this item shall be at the unit price indicated in the Prices Bid Table.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

**** END OF SECTION ****

SECTION 01026

SCHEDULE OF VALUES

PART 1 GENERAL

1.01 Requirements Included

The Schedule of Values is an itemized list that establishes the value or cost of each part of the work as defined in Section 01025, Part 1.04. All other work shall be paid according to the Prices Bid Table. It shall be used as the basis for preparing progress payments and may be used as a basis for negotiations concerning additional work or credits which may arise during the construction. Quantities and unit prices may be included in the schedule when approved by or required by the ENGINEER.

1.02 Preparation

- A. Schedule shall show breakdown of labor, materials equipment and other costs used in preparation of the Bid.
- B. Costs shall be in sufficient detail to indicate separate amounts for each Section of the Specifications.
- C. CONTRACTOR may include items for bond, insurance, temporary facilities and job mobilization within the mobilization bid item.
- D. Schedule of Values shall be prepared on 8-1/2 inch by 11 inch white paper.
- E. Use Table of Contents of the Specifications as basis for Schedule format and identify each item with number and title in the Table of Contents. List sub-items of major products or systems as appropriate or when requested by ENGINEER.
- F. When requested by ENGINEER, support values with data that will substantiate their correctness.
- G. The sum of the individual values shown on the Schedule of Values must equal the total Contract Price.
- H. The manner in which overhead and profit are shown shall be supported by the ENGINEER.
- I. Schedule shall show the purchase and delivery costs for materials and equipment that the CONTRACTOR anticipates he shall request payment for prior to their installation.

1.03 Submittal

Submit two copies of Schedule to ENGINEER for approval at least 20 days prior to submitting first application for a progress payment. After review by ENGINEER, revise and resubmit Schedule as required until it is approved.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

**** END OF SECTION ****

SECTION 01027

APPLICATIONS FOR PAYMENT

PART 1 GENERAL

1.01 Requirements Included

Submit Applications for Payment to the ENGINEER in accordance with the General Conditions and in the form required by the OWNER.

1.02 Format and Data Required

- A. Submit applications typed with itemized Schedule of Values data typed on 8-1/2 inch x 11 inch white continuation sheets.
- B. Provide detailed substantiating data on additional sheets, including paid invoices where applicable.

1.03 Preparation of Application for Progress Payments

- A. Application Form:
 - 1. Fill in required information, including that for Change Orders executed prior to date of submittal of application.
 - 2. Fill in summary of dollar values to agree with respective totals indicated on continuation sheets.
 - 3. Execute certification with signature of a responsible officer of the CONTRACTOR.
- B. Continuation Sheets:
 - 1. Fill in total list of all scheduled component items of work, with item number and scheduled dollar value for each item.
 - 2. Fill in dollar value in each column for each scheduled line item when work has been performed or products stored. Round off values to the nearest dollar or as specified for Schedule of Values.
 - 3. List each Change Order executed prior to date of submission by Change Order Number and description.
 - 4. To receive payment for materials stored on site, submit copies of the original paid invoices with the application for payment.

1.04 Substantiating Data for Progress Payments

- A. Provide substantiating data containing suitable information for review of costs requested with the applications for progress reports identifying:
 - 1. The payment item to which the substantiating data applies.
 - 2. Application number and date.
 - 3. Detailed list of enclosures.
 - 4. For stored materials:
 - a. Item number and identification as shown on application.
 - b. Description of specific material and invoice of delivered material.

-
- c. Consolidated inventory of stored materials showing:
 - (1) Materials received.
 - (2) Materials used.
 - d. Additional stored materials may not be claimed upon reaching 75% completion of the total project.
 - e. Stored Materials shall be inventoried jointly prior to each pay request.
 - B. Submit one copy of data for each copy of application for payment.
 - C. The CONTRACTOR is to maintain an updated set of record drawings in accordance with Section 01720. As a prerequisite for monthly progress payments, the CONTRACTOR is to exhibit the updated record drawings for review by the OWNER and the ENGINEER.
 - D. Construction photographs as required by Section 01380 will be submitted with each progress payment and shall be considered a part of that payment request.
 - E. Updated construction schedule showing work completed and work projected by month to the completion of the project.

1.05 Preparation of Application for Final Payment

- A. Fill in application form as specified for progress payments.
- B. Use continuation sheet for presenting the final statement of accounting.

1.06 Submittal Procedure

- A. Submit applications for payment to the ENGINEER at the times stipulated in the General Conditions.
- B. Initially a pencil draft application shall be informally submitted to the ENGINEER who shall review the draft with the CONTRACTOR and make adjustments as appropriate. The CONTRACTOR shall then prepare a formal typed application using the informally approved amounts and submit three (3) complete sets to the ENGINEER.
- C. When the ENGINEER finds the application properly completed and correct, as informally approved, he will transmit it to the OWNER for payment with a copy to the CONTRACTOR.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

**** END OF SECTION ****

SECTION 01030

SPECIAL PROJECT PROCEDURES

PART 1 GENERAL

1.01 WORKMANSHIP, MATERIAL AND EQUIPMENT

- A. When a particular product is specified or called for, it is intended and shall be understood that the Contractor include those products in his bid. Should the Contractor desire to substitute products which he purports to be equal to those specified, the Contractor shall furnish information as described in Section 00700, General Conditions, The alternative products(s) submitted by the Contractor shall meet the requirements of the specifications and shall, in all respects, be equal to the products specified by name herein.
- B. All apparatus, mechanism, equipment, machinery, and manufactured articles for incorporation into the Work shall be new and unused and the standard products of recognized reputable manufacturers.

1.02 PROVISIONS FOR CONTROL OF EROSION AND POLLUTANTS

Sufficient precautions shall be taken during construction to minimize the runoff of polluting substances such as silt, clay, fuels, oils, bitumens, calcium chloride, or other materials harmful to humans, fish, or other life, into the ground and surface waters of the state. Contractor will give all notices and comply with all laws, notices, ordinances, rules and regulations applicable to the work, without exception.

1.03 ON-SITE STORAGE

The Contractor's attention is invited to special storage requirements and possible charges for noncompliance of on-site storage requirements for materials and equipment as specified in Section 01600.

1.04 INCLEMENT WEATHER

- A. In the event of inclement weather, or whenever Engineer shall direct, Contractor and Subcontractors will protect carefully the work and materials against damage or injury from the weathers, including sudden rises in flows due to storms outside the immediate construction zone. Damaged Work and materials shall be removed and replaced. If, in the opinion of Engineer, any portion of Work or materials shall have been damaged or injured by reason of failure on the part of the Contractor or Subcontractors to so protect the Work, no additional time for removal and replacement will be given by the Owner.

1.05 WARRANTIES

- A. All work supplied under the Contract shall be warranted for a period of one (1) year or such longer period of time as may be prescribed by any special guarantee required by Change Orders or issued by Subcontractor, suppliers, or manufacturers, from the date of acceptance for operations (beneficial use) by the Owner as specified in Section 01740, Warranties and Bonds.
- B. The work shall be warranted to be free from defects in workmanship, design and materials. If any part of the work should fail during warranty period, it shall be replaced or restored to service at no expense to the Owner.

1.06 CONSTRUCTION CONDITIONS

The Contractor shall strictly adhere to the specific requirements of the governmental units(s) or agency(ices) having jurisdiction over the work. Wherever there is a difference in the requirements of a jurisdictional body and these Specifications, the more stringent shall apply.

1.07 PUBLIC NUISANCE

The Contractor shall not create a public nuisance, including, but not limited to, encroachment on adjacent lands, flooding of adjacent lands, or excessive noise.

1.08 SUSPENSION OF WORK DUE TO WEATHER

During inclement weather, all work which might be damaged or rendered inferior by such weather conditions shall be suspended. The orders and decisions of the Engineer as to suspensions shall be final and binding. The authority of the Engineer to issue such an order shall not be interpreted as a requirement to do so. During suspension of the work from any cause, the work shall be suitably covered and protected so as to preserve it from injury by the weather. Notwithstanding this provision, it is understood and agreed that the General Conditions shall control.

1.09 RELOCATIONS

The Contractor shall be responsible for the relocation of structures, including, but not limited to, light poles, signs, sign poles, fences, mailboxes, piping, conduits and drains that interfere with the positioning of the work as set out on the Drawings. The cost of all such relocations shall be included in the bid.

1.10 SALVAGE

Any existing equipment or materials, including, but not limited to, valves, pipes, fittings, couplings, etc., which are removed or replaced as a result of construction under this project may be designated as salvage by the Engineer and, if so, shall be removed and delivered to the Owner at a location directed by the Engineer.

1.11 PERMITS

Upon notice of award, the Contractor shall immediately apply for all applicable permits not previously obtained by the Owner to do the work from the appropriate governmental agency or agencies. No work shall commence until all applicable permits have been obtained and copies delivered to the Engineer. The costs for obtaining all permits shall be borne by the Contractor.

1.12 HAZARDOUS LOCATION

- A. The existing wet wells, manholes, sewers, force mains, pipes, and other related areas are hazardous locations in that explosive concentrations of sewage gas may be present. The Contractor is cautioned that the above areas, especially the wet well, may be deficient in oxygen. Checks shall be made by the Contractor whenever personnel are working in these areas to insure that adequate ventilation has been provided.
- B. In his operations in hazardous locations, the Contractor shall use spark-proof tools and explosion-proof temporary lighting and shall not use electric power tools, open flame devices, electric welding or any device or methods which might conceivably cause ignition or explosion.
- C. If a working is atmosphere is unsafe, the Contractor shall furnish, install, operate, and later remove such temporary auxiliary ventilating facilities as are necessary to provide a safe atmosphere.
- D. The Contractor shall also instruct and caution his employees and the employees of his subcontractors to avoid smoking while in the hazardous areas. Suitable prominent "No Smoking" signs shall be placed at locations where sewage gas could be present.

1.13 NOTIFICATION OF WORK ON EXISTING FACILITIES

Before commencing work on any of the existing structures or equipment, the Contractor shall notify the Engineer, in writing, at least ten (10) calendar days in advance of the date he proposes to commence such work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

*** * END OF SECTION * ***

SECTION 01041

PROJECT COORDINATION

PART 1 GENERAL

1.01 Work Progress

The CONTRACTOR shall furnish personnel and equipment which will be efficient, appropriate, and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the time stipulated in the contract. If at any time such personnel appear to the ENGINEER to be inefficient, inappropriate, or insufficient for performing the quality of work required or for producing the rate of progress aforesaid, he may order the CONTRACTOR to increase the efficiency, change the character or increase the personnel and equipment, and the CONTRACTOR shall conform to such order at his own expense. Failure of the ENGINEER to give such order shall in no way relieve the CONTRACTOR of his obligations to perform the work at the specified quality and rate of progress.

1.02 Private Land

The CONTRACTOR shall not enter or occupy private land outside of the OWNER'S land, right-of-ways, or servitudes except by written permission of both the OWNER and the Owner of the private land. Such permission shall be obtained by and at the expense of the CONTRACTOR and at no additional cost to the OWNER.

1.03 Work Locations

Work shall be located substantially as indicated on the Drawings, but the Engineer reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing structures or for other reasons.

1.04 Open Excavations

All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons and damage to property. The CONTRACTOR shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by the public, OWNER'S and ENGINEER'S personnel, and workmen.

1.05 Test Pits

Test pits for the purpose of locating underground utilities or structures which may interfere with installation of the Work shall be excavated in advance of the Work and backfilled by the CONTRACTOR. Test pits shall be backfilled immediately after their purpose has been satisfied and maintained in a manner satisfactory to the ENGINEER. The costs for such test pits shall be included in the cost of the work for which the test pits benefit.

1.06 Water for Construction Purposes

-
- A. In locations where public water supply is available, the CONTRACTOR shall purchase water for all construction purposes.
 - B. The CONTRACTOR shall make his own arrangements and pay all costs for connections to public water systems and for water used. Existing OWNER supplies or connections shall not be used without prior approval by OWNER.

1.07 Maintenance of Flow

The CONTRACTOR shall maintain the flow of sewers, drains, and water courses interrupted during the progress of the Work, including complete pumped bypass systems where necessary. The CONTRACTOR shall immediately remove all offensive matter. The entire procedure of maintaining existing flow shall be fully discussed with the ENGINEER well in advance of the interruption of any flow. All temporary works installed for flow maintenance shall be removed when the permanent work is finished and the areas cleaned and restored to good condition.

1.08 Protection of Construction and Equipment

- A. All newly constructed work shall be carefully protected from injury in any way. No wheeling or walking or placing of heavy loads on it shall be allowed. All portions of the work injured shall be reconstructed by the CONTRACTOR at his own expense.
- B. All structures shall be protected in a suitable manner. Should any parts of the structures become heaved, cracked or otherwise damaged, all such damaged portions of the work shall be completely repaired and made good by the CONTRACTOR at his own expense and to the satisfaction of the ENGINEER. If, in the final inspection of the work, any defects, faults or omissions are found, the CONTRACTOR shall cause the same to be repaired or removed and replaced by proper materials and workmanship without extra compensation for the materials and labor required. Further, the CONTRACTOR shall be fully responsible for the satisfactory maintenance and repair of the construction and other work undertaken herein for at least the guarantee period described in the contract.
- C. The CONTRACTOR shall take all necessary precautions to prevent damage to any structure due to water pressure (groundwater or surface water) during and after construction and until such structure is accepted and taken over by the OWNER.
- D. The CONTRACTOR is responsible for security of the site. Security of all equipment, material, tools, machinery, supplies, structures, buildings, vehicles and offices is the responsibility of the CONTRACTOR. Measures to affect job site security and limit unauthorized access, including temporary fencing, security guards, and other measures are the responsibility of the CONTRACTOR at his expense.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

**** END OF SECTION ****

SECTION 01041.1

UTILITIES COORDINATION

PART 1 GENERAL

1.01 UTILITIES

Utilities for the purpose of these specifications shall be considered as including, but not limited to: pipelines, conduits, cables, transmission lines and appurtenances of Public Utilities and those of Special Utility Districts, Cities or Towns, businesses or individuals solely for their own use or for use of their tenants; and storm drains, sanitary sewers, street lighting, traffic signal and fire alarm systems.

1.02 UNDERGROUND INSTALLATIONS

Existing underground pipelines and utilities are indicated on the Drawings only to the extent such information was made available to or discovered by Engineer in preparing drawings. There is no guarantee as to the accuracy or completeness of such information, and all responsibility for the accuracy and completeness thereof is expressly disclaimed by the Owner and the Engineer.

1.03 UTILITIES LOCATED IN CITY RIGHT-OF-WAY

Unless otherwise provided or excepted herein, the removal, adjusting, relocation, or replacement of utility structures or facilities within City right-of-way which may be necessary for construction of the work in accordance with these Contract Documents, shall be at the expense of the Contractor.

It shall be the Contractor's responsibility to protect and maintain those utilities which, in the opinion of the Engineer, do not need to be disturbed in order to accomplish the work required by the contract.

1.04 RELOCATIONS OF EXISTING GAS LINES, TELEPHONE LINES, ELECTRIC LINES, CABLE TV LINES AND WATER LINES

The Contractor shall notify the proper authority of the utility involved when relocation of these lines is required. The Contractor shall coordinate all work by the utility so that the progress of construction will not be hampered.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

The Contractor, when the Notice to Proceed is received, shall notify the owners of utilities affected by the work, the approximate date upon which he will begin work, and shall submit a progress schedule of the proposed work. This shall be deemed sufficient notice if the project progresses according to the progress schedule submitted with the notification. If changes in the schedule of the

work occur, the Contractor shall appraise both the owner of the utility affected and the Engineer so that adjustments in the work schedule of utility can be made. The Contractor shall be responsible for damages to the utility facility and construction delays resulting from failure to notify the utility and the Engineer of changes in procedure or location.

3.02 PROTECTION OF EXISTING UTILITIES

- A. The attention of the Contractor is drawn to the fact that during excavation, the possibility exists of the Contractor encountering various water, gas, telephone, electrical, or other utility lines not shown on the Drawings. The Contractor shall exercise extreme care before and during excavation to locate and flag these lines so as to avoid damage to the existing lines. Should damage occur to an existing line, the Contractor shall repair the line at no cost to the Owner.
- B. The Contractor shall assume full responsibility for the protection of all utilities, public and private, including poles, services to buildings, gas pipes, water pipes, hydrants, sewers, drains, and electric and telephone cables, whether or not they are shown on the Drawings. The Contractor shall carefully support and protect all such utilities from injury of any kind. Any damage resulting from the Contractor's operation shall be repaired by him at his expense.

The protection and preservation of utility facilities which are located within the right-of-way, but outside the normal limits of construction, as determined by the Engineer, shall be the responsibility of the Contractor. The Contractor shall be responsible for all damage to utilities which are due to his negligence.

- C. The Contractor shall bear full responsibility for obtaining locations of all underground structures and utilities (including existing water services, drain lines, and sewer). Services to buildings shall be maintained, and all costs or charges resulting from damage thereto shall be paid by the Contractor.
- D. If, in the opinion of the Engineer, permanent relocation of a utility owned by the City is required, he may direct the Contractor, in writing, to perform the work. Work so ordered will be paid for at the Contract unit prices, if applicable, or as extra work under Article 10 of the General Conditions. If relocation of a privately owned utility is required, the Contractor will notify the Utility to perform the work as expeditiously as possible. The Contractor shall fully cooperate with the County and Utility and shall have no claim for delay due to such relocation.
- E. The Contractor shall notify public and private utility companies in writing at least two, but not more than five full days (excluding Saturdays, Sundays, and legal holidays) before excavating near their utilities.

3.03 UTILITIES TO BE ADJUSTED

The owners of utility facilities which require relocation, removal, adjustment or replacement shall, if possible and feasible, perform this work prior to the commencement of the Contractor's work. Where utility work must be done in conjunction with the Contractor's work on the project or in conjunction with the work of other utilities, arrangements for when, how and where the operation is to proceed

shall be worked out among the parties concerned. If disputes arise, the Engineer shall decide the course of action to be taken.

3.04 UTILITIES CONFLICTING WITH OPERATIONS

Those utility facilities which do not conflict with the improvement, but which are obstructions to the operations required for installation or which are obstructions to the operations required for installation of which present unusual difficulty due to their close proximity to the area of the operations, shall be located with certainty by the owners of the utility prior to the arrival of the Contractor's operation which would be hindered by the utility facility. The Contractor is required to preserve the utility facility in place without damage and shall be responsible for damages sustained, if the utility owner has located the facility by exposing it to the view of the Contractor or has otherwise made the Contractor aware, with certainty, of the location of the facility. Any other arrangements that the Contractor may make with a utility owner as a substitute for the requirements of this Section shall require the approval of the Engineer, in writing.

3.05 MISLOCATED UTILITIES

The owner of a utility shall be wholly responsible for the proper location of his facilities which are affected by construction work performed according to these specifications. Improperly located or mislocated facilities which are damaged during construction shall be the responsibility of the utility, providing proper notification has been given.

*** * END OF SECTION * ***

SECTION 01045

CUTTING AND PATCHING

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

Contractor shall be responsible for all cutting, fitting and patching, including attendant excavation and backfill, required to complete the Work to include:

- A. Make its several parts fit together properly.
- B. Uncover portions of the Work to provide for installation of ill-timed work.
- C. Remove and replace defective work.
- D. Remove and replace work not conforming to requirements of the Contract Documents
- E. Remove samples of installed work as specified for testing.

1.02 SUBMITTALS

- A. Submit a written request to the Engineer well in advance of executing any cutting or alteration which affects:
 - 1. Work of the Owner or any separate contractor.
 - 2. Structural value or integrity of any element of the Project or work.
 - 3. Integrity or effectiveness of weather-exposed or moisture-resistant elements or systems.
 - 4. Efficiency, operational life, maintenance or safety of operational elements.
 - 5. Visual qualities of sight-exposed elements.
- B. Request shall include:
 - 1. Identification of the work.
 - 2. Description of affected work.
 - 3. The necessity for cutting, alteration or excavation.
 - 4. Effect on work of Owner or any separate Contractor, or on structural or weatherproof integrity of work.

-
5. Description of proposed work:
 - a. Scope of cutting, patching, alteration, or excavation.
 - b. Trades who will execute the work.
 - c. Products proposed to be used.
 - d. Extent of refinishing to be done.
 6. Alternatives to cutting and patching.
 7. Cost proposal, when applicable.
- C. Submit written notice to the Engineer designating the date and the time the work will be uncovered.

PART 2 PRODUCTS

2.01 MATERIALS

Comply with specifications and standards for each specific product involved.

PART 3 EXECUTION

3.01 INSPECTION

- A. Inspect existing conditions of Project, including elements subject to damage or to movement during cutting and patching.
- B. After uncovering work, inspect conditions affecting installation of products or performance or work.
- C. Report unsatisfactory or questionable conditions to the Engineer in writing; do not proceed with work until the Engineer has provided further instructions.

3.02 PREPARATION

- A. Provide adequate temporary support as necessary to assure structural value or integrity of affected portion of Work.
- B. Provide devices and methods to protect other portions of Project from damage.
- C. Provide protection from elements for the portion of the Project which may be exposed by cutting and patching work, and maintain excavations free from water.

3.03 PERFORMANCE

- A. Execute cutting and demolition by methods which will prevent damage to other work and will provide proper surfaces to receive installation of repairs.
- B. Execute excavating and backfilling by methods which will prevent settlement or damage to other work.
- C. Employ original installer or fabricator to perform cutting and patching for:
 - 1. Weather-exposed or moisture-resistant elements.
 - 2. Sight-exposed finished surfaces.
- D. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.
- E. Restore work which has been cut or removed; install new products to provide completed work in accord with requirements of Contract Documents.
- F. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:
 - 1. For continuous surfaces, refinish to nearest intersection.
 - 2. For an assembly, refinish entire unit.

*** * END OF SECTION * ***

SECTION 01050

FIELD ENGINEERING

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The Contractor shall provide and pay for field engineering services for:
 - 1. Survey work required in execution of work.
 - 2. Civil, structural, or other professional engineering services specified or required to execute the Contractor's construction method.
- B. The method of field staking for the construction of the work shall be at the option of the Contractor. The Owner shall provide the engineering surveys to establish reference points which in his judgment are necessary to enable the Contractor to proceed with his work.
- C. The accuracy of any method of staking shall be responsibility of the Contractor. All engineering for vertical and horizontal control shall be the responsibility of the Contractor.
- D. The Contractor shall be held responsible for the preservation of all stakes and marks. If any stakes or marks are carelessly or willfully disturbed by the Contractor, the Contractor shall not proceed with any work until he has reestablished such points, marks, lines and elevations as may be necessary for the prosecution of the work.
- E. The Contractor shall retain the services of a competent surveyor, registered in the State of Mississippi, to layout the work and maintain a survey during construction. The Contractor shall be solely responsible for proper location of the work.

1.02 SURVEY REFERENCE POINTS

Locate and protect control points prior to starting site work, and preserve all permanent reference points during construction.

- 1. Make no changes or relocations without prior written notice to the Engineer.
- 2. Report to the Engineer when any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations.

1.03 PROJECT SURVEY REQUIREMENTS

- A. Establish temporary bench marks as needed, referenced to data established by survey control points. Record locations, with horizontal and vertical data, on Record Drawings.
- B. Establish lines and levels, and locate and lay out, by instrumentation and similar appropriate

means:

1. Site improvements, including utility slopes and invert elevations.
 2. Batter boards for structures.
- C. From time to time, verify layouts by same methods.
- D. Establish all lines and grades prior to construction of site improvements.

1.04 RECORDS

- A. Maintain a complete, accurate log of all control and survey work as it progresses.
- B. At Contract closeout, submit a survey of installation of water mains, fire hydrants, and valves at the same scale as the Engineer's drawings indicating elevations and channel stationing at 100 foot increments.

1.05 SUBMITTALS

- A. On request of the Engineer, submit documentation to verify accuracy of field engineering work.
- B. Submit Drawings showing locations of all pipes and structures constructed. This Drawing shall be included with the Record Drawings.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

*** * END OF SECTION * ***

SECTION 01060

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

Abbreviations and acronyms used in Contract Documents to identify reference standards are as indicated herein.

1.02 QUALITY ASSURANCE

- A. Applications: When a standard is specified by references, comply with requirements and recommendations stated in the standard, except when requirements are modified by the Contract Documents, or applicable codes establish stricter standards.
- B. Publications Date: The publication in effect on the date of issue of Contract Documents, except when a specific publication date is specified.

1.03 ABBREVIATIONS, NAMES, AND ADDRESSES OF ORGANIZATIONS

The following standards may be referenced in the Contract Documents. The contractor shall obtain copies of reference standards directly from the publication source when needed for proper performance of Work or when required for submittal by Contract Documents.

AAN	American Association for Nurserymen 1250 I Street N.W., Suite 500 Washington, DC 20005 (202) 789-2900
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street, N.W., Suite 225 Washington, DC 20001 (202) 624-5800
ACI	American Concrete Institute Post Office Box 19150 22400 W. Steven Mile Road Detroit, MI 48219 (313) 532-2600
ACPA	American Concrete Pipe Association 8320 Old Courthouse Road, Suite 201 Vienna, VA 22180 (703) 821-1990
AI	Asphalt Institute

	Asphalt Institute Building College Park, MD 20740-1802
AISC	American Institute of Steel Construction 400 North Michigan Avenue Chicago, IL 60611 (312) 670-2400
AISI	American Iron and Steel Institute 1133 15th Street N.W., Suite 300 Washington, DC 20005 (202) 452-7100
ANSI	American National Standard Institute 1430 Broadway New York, NY 10018 (212) 354-3300
ASCE	American Society of Civil Engineers 345 East 47th Street New York, NY 10017 1-800-548-ASCE 345 East 47th Street New York, NY 10017 (212) 705-7722
ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103 (215) 299-5400
AWPA	American Wood Preserver's Association Post Office Box 849 Stevensville, MD 21666 (301) 643-4163
AWS	American Welding Society Post Office Box 351040 550 LeJeune Road, N.W. Miami, FL 33126 1-800-443-9353
AWWA	American Water Works Association 6666 W. Quincy Avenue Denver, CO 80235 (303) 794-7711
CLFMI	Chain Link Fence Manufacturers Institute

	1776 Mass Avenue N.W., Suite 500 Washington, DC 20036 (202) 659-3537
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173 (312) 517-1200
DIPRA	Ductile Iron Pipe Research Association 245 Rivercase Parkway E., Suite 100 Birmingham, AL 35244 (205) 988-9870
FS	Federal Specification General Services Administration Specifications and Consumer Information & Distribution Section (WFSIS) 7 and D Street S.W., Room 654 Washington, DC 20407 (202) 472-2140
IEEE	Institute of Electrical and Electronic Engineers Service Center 345 E. 47th Street New York, NY 10017 (212) 705-7900
MDOT	Mississippi Department of Transportation P. O. Box 1850 Jackson, Ms 39215-1850 (601) 359-1213
MIL	Department of the Navy Navel Publications and Forms Center 5801 Torbor Avenue Philadelphia, PA 19120-5099 (215) 697-2667
NEC	National Electric Code National Fire Protection Association Batterymarch Park Quincy, MA 02269 (617) 770-3000
NEMA	National Electrical Manufacturer's Association 2101 L Street, NW, Suite 300 Washington, DC 20037 (202) 457-8400
NSPE	National Society of Professional Engineers

	1420 King Street Alexandria, VA 22314 (703) 684-2835
OSCI	Office of Standards Code and Information National Bureau of Standards Gaithersburg, MD 20899 (301) 975-4029
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077 (312) 966-6200
PCI	Prestressed Concrete Institute 175 W. Jackson Blvd., Suite 1859 Chicago, IL 60604 (312) 786-0300
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association Post Office Box 70 Merrifield, VA 22116 (703) 790-9890
SSPC	Steel Structures Painting Council 4400 5th Avenue Pittsburgh, PA 15213 (412) 268-3327
UL	Underwriter's Laboratories, Inc. 333 Pfingsten Road Northbrook, IL 60062 (312) 272-8800

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION(NOT USED)

*** * END OF SECTION * ***

SECTION 01200
PROJECT MEETINGS

PART 1 GENERAL

1.01 Requirements Included

- A. The ENGINEER shall schedule and administer a preconstruction meeting, construction progress meetings, and specially called meetings throughout the progress of the work. The ENGINEER will:
 - 1. Prepare agenda for meetings.
 - 2. Make physical arrangements for meetings.
 - 3. Preside at meetings.
 - 4. Record the minutes; include significant proceedings and decisions.
 - 5. Reproduce and distribute copies of minutes.
- B. The CONTRACTOR and representatives of, where appropriate, subcontractors and suppliers shall attend meetings. The representative shall be qualified and authorized to act on behalf of the entity each represents.
- C. The CONTRACTOR shall attend and identify at the meetings the actual status of the Contract Work and, when the Work is not being performed consistently with the Contract Documents and construction schedules, shall identify at the meetings the steps he is taking to resolve the inconsistency.

1.02 Pre-construction Meeting

- A. The CONTRACTOR shall participate in a preconstruction meeting to be held after the effective date of the Agreement and prior to the date of Notice to Proceed.
- B. The following are expected to be in attendance:
 - 1. OWNER'S Representative and other staff as appropriate.
 - 2. ENGINEER and his professional consultants as appropriate.
 - 3. ENGINEER's Resident Project Representative.
 - 4. CONTRACTOR's Representative and Construction Superintendent.
 - 5. Subcontractors as appropriate.
 - 6. Utility representatives as appropriate.
 - 7. Others as appropriate.
- C. The following matters are expected to be addressed:
 - 1. Distribution and discussion of:
 - a. List of major subcontractors.
 - b. Project construction schedules.
 - 2. Critical work sequencing.
 - 3. Project Coordination.
 - 4. Designation of responsible personnel.
 - 5. Procedures and processing of:

-
- a. Field decisions.
 - b. Proposal requests.
 - c. Submittals.
 - d. Change Orders.
 - e. Applications for Payment.
 6. Distribution of Contract Documents.
 7. Procedures for maintaining Record Documents.
 8. Use of premises:
 - a. Office, work and storage areas.
 - b. OWNER'S requirements.
 9. Construction facilities, controls and construction aids.
 10. Temporary utilities.
 11. Housekeeping procedures.
 12. Insurance certifications.
 13. Liquidated damages for delay.
 14. Weekly job meetings.
 15. Laboratory testing of material requirements.

1.03 Construction Progress Meetings

- A. Construction progress meetings will be held monthly with the first meeting 30 days or less after the date of Notice to Proceed.
- B. Special construction progress meetings will be held as required by progress of the Work.
- C. The following are expected to be in attendance:
 1. OWNER Representative and other staff as appropriate.
 2. The ENGINEER and his professional consultants as appropriate.
 3. CONTRACTOR's Representative and/or construction Superintendent.
 4. Subcontractors as appropriate.
 5. Suppliers as appropriate.
 6. Others as appropriate.
- D. The following matters are expected to be addressed:
 1. Review and approve minutes of previous meeting.
 2. Review of work progress.
 3. Field observations, problems, conflicts.
 4. Problems which impede Construction Schedule.
 5. Review of off-site fabrication, delivery schedules.
 6. Corrective measures and procedures to regain Construction Schedule.
 7. Revisions to Construction Schedule.
 8. Progress and schedule during succeeding work period.
 9. Payment applications and processing.
 10. Submittals.
 11. Maintenance of quality standards.
 12. Changes, substitutions, and Change Orders.

-
- 13. Review proposed changes for:
 - a. Effect on Construction Schedule and completion date.
 - b. Effect on other contracts of the Project.
 - 14. Other matters as appropriate.
 - 15. Record drawings.
- E. The CONTRACTOR shall be prepared to discuss the above topics and to make commitments for resolving deficiencies.
- F. The CONTRACTOR shall provide a current submittal log at each progress meeting in accordance with Section 01340.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

**** END OF SECTION ****

SECTION 01310
CONSTRUCTION SCHEDULES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Contractor shall comply with the General Conditions.
- B. Submit revised progress schedules periodically.

1.02 FORM OF SCHEDULES

- A. Prepare schedules in the form of a horizontal bar chart.
 - 1. Provide separate horizontal bar for each trade or operation.
 - 2. Horizontal time scale; identify the first work day of each week.
 - 3. Scale and spacing: To allow for notations and future revisions.
 - 4. Minimum sheet size: 8-1/2 inches by 11 inches.
- B. Format of listings: The table of contents of the Contract Documents.
- C. Identification of listings: Items of work.

1.03 CONTENT OF SCHEDULE:

- A. Construction Progress Schedule:
 - 1. Show the complete sequence of construction by activity.
 - 2. Show the dates for the beginning, and completion of each major element of construction.
 - 3. Show projected percentage of completion for each item, as of the first day of each month.
 - 4. Show an anticipated monthly payment schedule.
- B. Submittal Schedule for Shop Drawings, Product Data and Samples. Show:
 - 1. The dates for Contractor's submittal.
 - 2. The dates approved submittal will be required from the Engineer.

1.04 PROGRESS REVISIONS

- A. Indicate progress of each activity to date of submission.
- B. Show changes occurring since previous submission of schedule:
 - 1. Major changes in scope.
 - 2. Activities modified since previous submission.
 - 3. Revised projections of progress and completion.
 - 4. Other identifiable changes.
- C. Provide a narrative report as needed to define:
 - 1. Problem areas, anticipated delays, and the impact on the schedule.
 - 2. Corrective action recommended, and its effect.

1.05 SUBMISSIONS

- A. Submit initial schedules in accordance with the General Conditions.
 - 1. Engineer will review schedules and return review copy within ten (10) days after receipt.
 - 2. If required, Contractor shall resubmit within seven (7) days after return of review copy.
- B. Submit revised progress schedules with each Application for Payment.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

**** END OF SECTION ****

SECTION 01340

SHOP DRAWINGS, PROJECT DATA, AND SAMPLES

PART 1 GENERAL

1.01 Requirements Included:

- A. The Contractor shall submit to the Engineer for review and exception, if any, such working drawings, shop drawings, test reports and data on materials and equipment (hereinafter in this article called data), and material samples (hereinafter in this article called samples) as are required for the proper control of work, including but not limited to those working drawings, shop drawings, data and samples for materials and equipment specified elsewhere in the Specifications and in the Contract Drawings.
- B. Within fifteen (15) calendar days after the Effective Date of the Agreement, the Contractor shall submit to the Engineer a complete list of preliminary data on items for which Shop Drawings are to be submitted. Included in this list shall be the names of all proposed manufacturers furnishing specified items. Review of this list by the Engineer shall in no way relieve the Contractor from submitting complete shop drawings, data, and samples in accordance with the Specifications. This procedure is required in order to expedite final review of Shop Drawings.
- C. The Contractor is to maintain an accurate updated submittal log and will bring this log to each scheduled progress meeting. This log should include the following items:
 - 1. Submittal Description and Number assigned.
 - 2. Date to Engineer.
 - 3. Date returned to Contractor (from Engineer).
 - 4. Status of Submittal (No exceptions taken, returned for confirmation or resubmittal, rejected).
 - 5. Date of Resubmittal and Return (as applicable).
 - 6. Date material released (for fabrication).
 - 7. Projected date of fabrication.
 - 8. Projected date of delivery to site.
 - 9. Status of O&M manuals submittal.

1.02 Contractor's Responsibility

-
- A. It is the duty of the Contractor to check all drawings, data and samples prepared by or for him before submitting them to the Engineer for review. Each and every copy of the Drawings and data shall bear Contractor's stamp showing that they have been so checked. Shop drawings submitted to the Engineer without the Contractor's stamp or evidence that the Contractor has not performed the required review will be returned to the Contractor for conformance with this requirement. Shop drawings shall indicate any deviations in the submittal from requirements of the Contract Documents.
- B. Determine and verify:
1. Field measurements.
 2. Field construction criteria.
 3. Catalog numbers and similar data.
 4. Conformance with Specifications and indicate all variances from the Specifications.
- C. The Contractor shall furnish the Engineer a schedule of Shop Drawing submittals fixing the respective dates for the submission of shop and working drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment. This schedule shall indicate those that are critical to the progress schedule.
- D. The Contractor shall not begin any of the work covered by a drawing, data, or a sample returned for correction until a revision or correction thereof has been reviewed and returned to him by the Engineer with no exceptions taken.
- E. The Contractor shall submit to the Engineer all drawings and schedules sufficiently in advance of construction requirements to provide no less than twenty-one (21) calendar days for checking and appropriate action from the time the Engineer receives them.
- F. The Contractor shall submit five (5) copies of shop drawings and descriptive or product data submittal to complement shop drawings to the Engineer which will be retained for his use.
- G. The Contractor shall be responsible for and bear all cost of damages which may result from the ordering of any material or from proceeding with any part of work prior to the completion of the review by Engineer of the necessary shop drawings.
- H. The Contractor shall utilize a Sequential Numbering System for submittals (1-999). Resubmittals or confirming material shall be assigned a letter next to the submittal number, i.e. A= second submittal, B= third submittal, etc.
- I. Submittals shall include a certified statement of compliance to the requirements detailed in the specifications in addition to other submittal requirements. This certification shall be prepared by the manufacturer and not the local supplier. Validity of the authority and position of the person signing the certification shall be verified by a Notary Public. The statement of compliance shall address each point of conformance contained in the governing specifications with definite comments of either compliance or non-compliance. Statements of non-compliance with points of conformance shall be accompanied by a statement of

justification as to the reason for non-conformance and why the non-complying feature is considered to be either equal to or better than the specified feature. The Engineer will use the certified statement of compliance in his evaluation of the submittal rendering a judgment as to equality to the specified product and issuing a statement as to whether the product is acceptable for or rejected from incorporation into the work.

- J. When a manufacturer named in the controlling specification is chosen to supply a product and the details of manufacture, size, and installation are shown on this standard catalog cut sheets, the manufacturer may submit the certified statement of compliance as detailed above along with installation details specific to the work such as laying schedules, etc. as required, deleting the standardized catalog data.

1.03 Engineer's Review of Shop Drawings

- A. The Engineer's review of drawings, data and samples submitted by the Contractor will cover only general conformity to the Specifications, external connections, and dimensions which affect the installation.
- B. The review of drawings and schedules will be general, and shall not be construed:
1. as permitting any departure from the Contract requirements;
 2. as relieving the Contractor of responsibility for any errors, including details, dimensions, omissions and materials;
- C. If the drawings or schedules as submitted describe variations per subparagraph (1.04.D), and show a departure from the Contract requirements which Engineer finds to be in the best interest of the Owner and to be so minor as not to involve a change in Contract Price or Time, The Engineer may return the reviewed Drawings without noting any exception.
- D. After the ENGINEER completes his review, the Shop Drawings will be marked with one of the following notations:
1. No Exceptions Taken.
 2. Make Corrections Noted.
 3. Revise and Resubmit.
 4. Rejected.
 5. Submit Specified Item.
- E. If a submittal is acceptable, it will be marked "No Exception Taken" or "Make Corrections Noted". Three copies of the submittal will be returned to the CONTRACTOR.
- F. Upon return of a submittal marked "No Exception Taken" or "Make Corrections Noted", the CONTRACTOR may order, ship or fabricate the materials included on the submittal, provided it is in accordance with the corrections indicated.
- G. If a Shop Drawing action is "Make Corrections Noted" but has extensive corrections or corrections affecting other drawings or Work, the ENGINEER may require that the CONTRACTOR make the corrections indicated thereon and resubmit the Shop Drawings for

record purposes. In this case, the submittal will be marked "Make Corrections Noted-Resubmit".

- H. If a submittal is unacceptable, two copies will be returned to the CONTRACTOR with one of the following notations:
 - 1. "Revise and Resubmit"
 - 2. "Rejected"
- I. Upon return of a submittal marked "Revise and Resubmit", the CONTRACTOR shall make the corrections indicated and repeat the initial approval procedure. The "Rejected" notation is used to indicate material or equipment that is not acceptable. Upon return of a submittal so marked, the CONTRACTOR shall repeat the initial approval procedure utilizing acceptable material or equipment.
- J. Submittals lacking adequate details or information to allow the ENGINEER to determine whether or not the submittal meets the intent of the Contract specifications shall be marked "Submit Specified Item" and returned without further comment.
- K. Shop Drawings or other submittals not bearing the ENGINEER'S "No Exception Taken" or "Make Corrections Noted" notations shall not be issued to Subcontractors nor utilized for construction purposes. No Work shall be performed or equipment installed without a drawing or submittal bearing one of these notations.
- L. In the event the CONTRACTOR obtains the ENGINEER'S approval for the use of equipment other than that which is shown or specified, the CONTRACTOR shall, at his own expense and using methods approved by the ENGINEER, make all changes to the Work, including structures, piping, electrical, equipment and controls, that may be necessary to accommodate this equipment.
- M. Resubmittals will be handled in the same manner as first submittals. The Contractor shall direct specific attention to revisions other than the corrections requested by the Engineer on previous submissions by written details or markings on the resubmitted Shop Drawings. The Contractor shall make any corrections required by the Engineer.
- N. If the Contractor considers any correction indicated on the Drawings to constitute a change to the Contract Drawings or Specifications, the Contractor shall give written notice thereof to the Engineer.
- O. The Engineer will review a submittal/resubmittal a maximum of three times after which cost of review will be borne by the Contractor. The cost of engineering shall be equal to the Engineer's charges to the Owner under the terms of the Engineer's agreement with the Owner.
- P. When the Shop Drawings have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions or approval from the Engineer.

Q. No partial submittals will be reviewed. Submittals not complete will be returned to the Contractor, and will be considered "NOT APPROVED" until resubmitted.

1.13 SHOP DRAWINGS

- A. Shop drawings shall be complete and detailed.
- B. Drawings and schedules shall be checked and coordinated with the work of all trades involved, before they are submitted for review by the Engineer and shall bear the Contractor's stamp of approval as evidence of such checking and coordination. Drawings or schedules submitted without this stamp of approval shall be returned to the Contractor for resubmission.
- C. Each shop drawing shall have a blank area 3-1/2 inches by 3-1/2 inches, located adjacent to the title block. The title block shall display the following:
 - 1. Number and title of the drawing.
 - 2. Date of drawing or revision.
 - 3. Name of project building or facility.
 - 4. Name of contractor and subcontractor submitting drawing.
 - 5. Clear identification of contents and location of the work.
 - 6. Specification number and title.
- D. If Drawings show variations from Contract requirements because of standard Shop practice or other reasons, the Contractor shall describe such variations in his letter of transmittal. If acceptable, proper adjustment in the Contract shall be implemented where appropriate. If the Contractor fails to describe such variations, he shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though such Drawings have been reviewed.
- E. Data on materials and equipment include, without limitation, materials and equipment lists, catalog data sheets, cuts, performance curves, diagrams, materials of construction and similar descriptive material as required. Materials and equipment lists shall give for each item thereon the name and location of the supplier or manufacturer, trade name, catalog reference, size, finish, and all other pertinent data.
- F. The Contractor shall provide a list including the equipment name, address, and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained for all mechanical and electrical equipment furnished.
- G. All manufacturers or equipment suppliers who proposed to furnish equipment or products shall submit an installation list to the Engineer along with the required Shop Drawings. The

installation list shall include at least five installations where identical equipment has been installed and has been in operation for a period of at least one (1) year.

- H. Only the Engineer will utilize the color red in marking Shop Drawing submittals.
- I. Before final payment is made, the Contractor shall furnish to Engineer five (5) sets of record shop drawings all clearly revised, complete and up to date showing the permanent construction as actually made for all reinforcing and structural steel, miscellaneous metals, process and mechanical equipment, yard piping, electrical system and instrumentation system.

1.13 Working Drawings

- A. Working drawings shall be considered to mean the Contractor's plans for temporary structures.
- B. Copies of working drawings as noted in subparagraph 1.02, shall be submitted to the Engineer where required by the Contract Documents or requested by the Engineer, and shall be submitted at least thirty (30) calendar days (unless otherwise specified by the Engineer) in advance of their being required for work.
- C. The Engineer will not review working drawings but shall use them as information to monitor the work performed by the Contractor.

1.14 Samples

- A. The Contractor shall furnish for the review of the Engineer samples required by the Contract Documents or requested by the Engineer. Samples shall be delivered to the Engineer as specified or directed and the Contractor shall prepay all shipping charges. Materials or equipment for which samples are required shall not be used in work until reviewed by the Engineer.
- B. Samples shall be of sufficient size and quantity to clearly illustrate:
 - 1. Functional characteristics of the product, with integrally related parts and attachment devices.
 - 2. Name of Contractor and Subcontractor
 - 3. Material or Equipment represented
 - 4. Place of Origin
 - 5. Name of Producer and Brand (if any).
 - 6. Location in Project

(Samples of finished materials shall have additional marking that will identify them under the finished schedules.)

- C. The Contractor shall prepare a transmittal letter in triplicate for each shipment of samples containing the information required in subparagraph 1.06B above. He shall enclose a copy of this letter with the shipment and send a copy of this letter to the Engineer under separate cover and the remaining copy shall be for the Contractor's records. Review of a sample shall be only for the characteristics or use named and shall not be construed to change or modify any Contract requirements.
- D. Reviewed samples not destroyed in testing shall be sent to the Engineer or stored at the site of the work. Reviewed samples of the hardware in good condition will be marked for identification and may be used in the work. Materials and equipment incorporated in work shall match the reviewed samples. Samples which failed testing or were rejected will be returned to the Contractor at his expense, if so requested at time of submission.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

*** * END OF SECTION * ***

SECTION 01410

TESTING LABORATORY SERVICES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

Contractor will employ and pay for the services of an Independent Testing Laboratory to perform testing specifically indicated on the Contract Documents or specified in the Specifications and may at any other time elect to have materials and equipment tested for conformity with the Contract Documents.

- A. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the Work of the Contract.

1.02 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

Laboratory is not authorized to:

- A. Release, revoke, alter or enlarge on requirements of Contract Documents.
- B. Approve or accept any portion of the Work.
- C. Perform any duties of the Contractor.

1.03 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with laboratory personnel; provide access to Work, to Manufacturer's operations.
- B. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.
- C. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other materials mixes which require control by the testing laboratory.
- D. Materials and equipment used in the performance of work under this Contract are subject to inspection and testing at the point of manufacture or fabrication. Standard specifications for quality and workmanship are indicated in the Contract Documents. The Owner may require the Contractor to provide statements or certificates from the manufacturers and fabricators that the materials and equipment provided by them are manufactured or fabricated in full accordance with the standard specifications for quality and workmanship indicated in the Contract Documents. All costs of this testing and providing statements and certificates shall be a subsidiary obligation of the Contractor, and no extra charge to the Owner shall be allowed on account of such testing and certification.
- E. Furnish incidental labor and facilities:
 - 1. To provide access to Work to be tested.

-
- 2 To obtain and handle samples at the Project site or at the source of the product to be tested.
 3. To facilitate inspections and tests.
 4. For storage and curing of test samples.
- F. Notify laboratory at least 24 hours in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.
- G. Employ and pay for the services of the same or a separate, equally qualified independent testing laboratory to perform additional inspections, sampling and testing required for the Contractor's convenience and as approved by the Owner.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

*** * END OF SECTION * ***

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

Material and equipment incorporated into the Work shall:

- A. Conform to applicable specifications and standards.
- B. Comply with size, make, type, and quality specified to the greatest extent possible, detailing all aspects and providing explicit reasons for parameters not in compliance and specifically approved in writing by the Engineer.
- C. Manufactured and Fabricated Products:
 - 1. Design, fabricate, and assemble in accord with the best engineering and standard shop practices.
 - 2. Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable.
 - 3. Two or more items of the same kind shall be produced, by the same manufacturer.
 - 4. Products shall be suitable for service conditions.
 - 5. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
- D. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.02 APPROVAL OF MATERIALS

- A. Only new materials and equipment shall be incorporated in the Work. All materials and equipment furnished by the Contractor shall be subject to the inspection and approval of the Engineer. No material shall be delivered to the Work without prior approval of the Engineer.
- B. The Contractor shall submit to the Engineer, data relating to materials and equipment he proposes to furnish for the work. Such data shall be in sufficient detail to enable the Engineer to identify the particular product along with references to the applicable section(s) of the specifications to form an opinion as to its conformity to the specifications. The data shall comply with Paragraph 1.06 of this Section.
- C. Facilities and labor for handling and inspection of all materials and equipment shall be furnished by the Contractor. If the Engineer requires, the Contractor shall submit samples of materials for such special tests as may be necessary to demonstrate that they conform to the

specifications. Such samples shall be furnished, stored, packed, and shipped as directed at the Contractor's expense. Except as otherwise noted, the Contractor will make arrangements for and pay for the tests. Where such tests confirm compliance with the specifications, the Owner will reimburse the actual charges of the testing firm paid by the Contractor.

- D. Contractor shall submit data and samples sufficiently early to permit consideration, approval, manufacture, and delivery of materials before they are necessary for incorporation in the work. Any delay of approval resulting from the Contractor's failure to submit samples or data promptly shall not be used as a basis of claim against the Owner or the Engineer.
- E. The materials and equipment used in the Work shall correspond to the approved samples or other data.

1.03 MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION

- A. When Contract Documents require that installation of the Work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, including five copies to the Engineer. One complete set of the installation instructions shall be available for use on the job site during and through completion of the Work.
- B. Handle, install, connect, clean, condition and adjust products as required by the manufacturer's instructions and in conformity with specified requirements.
 - 1. Should the specified requirements conflict with the manufacturer's instructions, the manufacturer's instructions shall have priority unless changes are authorized in writing by the manufacturer.
 - 2. Should job conditions conflict with the manufacturer's instructions, consult with the manufacturer for clarification.
 - 3. Clarifications of installation instructions shall be issued only by the manufacturer, shall be in writing, and shall be distributed to all parties involved in the installation as stated above and prior to alteration of the installation procedures.
 - 4. Do not proceed with the Work without clear instructions concerning the specific installation procedures.
- C. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by the manufacturer.

1.04 TRANSPORTATION AND HANDLING

- A. Arrange deliveries of Products as required by the currently approved construction schedule coordinating each delivery to avoid conflict with other work and conditions at the site.
 - 1. Deliver Products in a undamaged condition, in the manufacturer's original containers or packaging and with identifying labels intact and legible.
 - 2. Prior to accepting delivery, inspect shipments to assure compliance with approved submittal, and that the Products have been properly protected and are undamaged.
- B. Provide equipment and personnel to handle Products preventing soiling or damage to the Products or their protective packaging.

1.05 STORAGE AND PROTECTION

- A. Store Products in accord with manufacturer's instruction, with seals and labels intact and legible.
 - 1. Store products subject to damage by the elements in weathertight enclosures.
 - 2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.
 - 3. Store fabricated products above the ground, on blocking or skids, prevent spoiling, staining or corrosion. Cover products which are subject to deterioration with impervious sheet coverings and provide adequate ventilation to avoid condensation.
 - 4. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.
- B. All materials and equipment to be incorporated in the Work shall be handled and stored in a manner to prevent warping, twisting, bending, breaking, chipping, rusting, and other injury, theft or damage.
- C. Cement and lime shall be stored under a roof and off the ground and shall be kept completely dry at all times. All miscellaneous steel, structural steel and reinforcing steel shall be stored off the ground, kept free of accumulations of dirt and grease, and in areas free of standing water to minimize rusting. Precast concrete sections shall be handled and stored in a manner to prevent staining, chipping or cracking. Brick, block and similar masonry products shall be handled and stored in a manner to reduce staining, breaking, chipping, cracking, and spalling.
- D. All materials which, in the opinion of the Engineer, have become so damaged as to be unfit for the use intended, including aesthetics, shall be promptly removed from the site of the work.
- E. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections and exercise or rotate moving parts of stored products as required by the

manufacturer to assure that products are maintained under specified conditions and free from damage or deterioration.

- F. Provide substantial coverings as necessary to protect installed products from damage caused by traffic and subsequent construction operations. Remove the protective covering when no longer needed.
- G. The Contractor shall be responsible for all material, equipment, and supplies sold and delivered to the Owner under this Contract until final inspection of the Work and acceptance thereof by the Owner. In the event any such material, equipment, and supplies are lost, stolen, damaged, or destroyed prior to final inspection and acceptance they shall be replaced by the Contractor.
- H. Should the Contractor fail to take proper action to properly store and handle equipment supplied under this Contract, the Owner retains the right to notify the Contractor in writing of the deficiencies, to correct all deficiencies and deduct the cost associated with these corrections from the contractor's Contract. These costs may be comprised of expenditures for labor, equipment usage, administration, clerical, engineering and any other costs associated with making the necessary corrections.

1.06 SUBSTITUTIONS AND PRODUCT OPTIONS

A. Products List:

Within fifteen (15) days after the Notice to Proceed, submit to the Engineer complete list of major products proposed to be used, with the name of the manufacturer and the installing subcontractor.

B. Contractor's Options:

- 1. For Products specified only by reference standard, select any product meeting that standard.
- 2. For Products specified by naming one or more Products or manufacturers and "or equal", Contractor must submit a request as for substitutions for any Product or manufacturer not specifically named.

C. Substitutions:

- 1. For a period of thirty (30) days after the Effective Date of the Agreement, the Engineer will consider written requests from Contractor for substitution of Products.

-
2. Submit a separate request for each Product, supported with complete data, with drawings and samples as appropriate, including:
 - a. Comparison of the qualities of the proposed substitution with that specified.
 - b. Changes required in other elements of the work because of the substitution.
 - c. Effect on the construction schedule.
 - d. Cost data comparing the proposed substitution with the Product specified.
 - e. Any required license fees or royalties.
 - f. Availability of maintenance service, and source of replacement materials.
 3. The Engineer shall be the judge of the acceptability of the proposed substitution.

D. Contractor's Representation:

A request for a substitution constitutes a representation that Contractor:

1. Has investigated the proposed Product and determined that it is equal to or superior in all respects to that specified.
2. Will provide the same warranties or bonds for the substitution as for the Product specified.
3. Will coordinate the installation of an accepted substitution into the Work, and make such other changes as may be required to make the Work complete in all respects.
4. Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.

1.07 SPECIAL TOOLS

Manufacturers of equipment and machinery shall furnish any special tools required for normal adjustment, operations and maintenance, together with instructions for their use. The Contractor shall preserve and deliver to the Owner these tools and instructions in good order no later than upon completion of the Contract.

1.08 WARRANTY

For all major pieces of equipment, submit a warranty from the equipment manufacturer. The manufacturer's warranty period shall be concurrent with the Contractor's as stipulated in the specifications for each piece of equipment.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

*** * END OF SECTION * ***

SECTION 01630

SUBSTITUTIONS

PART 1 GENERAL

1.01 General

Requests for review of a substitution shall conform to the requirements of Article 6.05 of the General Conditions and shall contain complete data substantiating compliance of proposed substitution with Contract Documents.

1.02 Substitutions

- A. During a period of 60 days after execution of Contract, ENGINEER will consider written requests from CONTRACTOR for substitution of products or construction methods (if specified).
 - 1. After end of specified period, requests will be considered only in case of unavailability of products or other conditions beyond control of CONTRACTOR.
 - 2. If the CONTRACTOR proposes to use products other than named manufacturers in the technical Specification, the ENGINEER reserves the right to require the CONTRACTOR to submit information within the first 30 days after the NOTICE TO PROCEED verifying that the proposed equipment will comply with the Specifications.
- B. Requests for review of a substitution shall conform to the requirements of Article 6.05 of the General Conditions, and shall contain complete data substantiating compliance of proposed substitution with the Contract Documents.
- C. In making request for substitution, CONTRACTOR represents:
 - 1. CONTRACTOR has investigated proposed product or method, and determined that it is equal or superior in all respects to that specified.
 - 2. CONTRACTOR will provide the same or better warranties or bonds for proposed substitution as for product or method specified.
 - 3. CONTRACTOR waives all claims for additional costs or extension of time related to proposed substitution that subsequently may become apparent.
- D. Proposed substitutions will not be accepted if:
 - 1. They are only shown or implied on the Shop Drawings.
 - 2. Acceptance will require substantial revision of Contract Documents.
 - 3. They will change design concepts or Specifications.
 - 4. They will delay completion of the Work, or the work of other contractors.
- E. The ENGINEER will determine whether substitute brands or products are equal to those specified in the Contract Documents. No substitute will be ordered or installed without the ENGINEER'S prior written acceptance.
- F. The OWNER may require CONTRACTOR to furnish at CONTRACTOR'S expense a

special performance guarantee or other surety with respect to any substitute.

- G. If the ENGINEER determines that a proposed substitute is not equal to that specified or described in the Drawings or Specifications, CONTRACTOR shall furnish one of the brands or products specified or described, at no additional cost to the OWNER.
- H. Engineering Costs:
1. The ENGINEER will record all time required in evaluating substitutions proposed by CONTRACTOR and in making any change in the Drawings or Specifications occasioned thereby. Whether or not the ENGINEER accepts a proposed substitute CONTRACTOR will reimburse the OWNER for the actual cost of the ENGINEER for evaluating any proposed substitute which either does not meet the requirements of the Drawings and Specifications, or the acceptance of which would require changes to other portions of the Work.
 2. CONTRACTOR shall reimburse OWNER for all associated engineering costs, including redesign, additional shop drawing reviews, investigations, consultant fees and revision of the Contract Documents required because of the substitution.
- I. The time required by the ENGINEER to evaluate and either accept or reject proposed substitutes is included in the Contract Time and no extension of the Contract Time shall be allowed therefore.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

*** * END OF SECTION * ***

SECTION 01710

CLEANING

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

Cleaning shall include daily "policing" of the work and surrounding areas to clear general debris waste paper, wood scraps, broken concrete, loose riprap, and other objectionable material along with the final cleanup of site(s) required for project acceptance. **DAILY CLEANUP IS REQUIRED.**

1.02 DISPOSAL REQUIREMENTS

Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 DURING CONSTRUCTION

- A. Execute daily cleaning to keep the Work, the site and adjacent properties, free from accumulations of waste materials, rubbish and windblown debris, resulting from construction operations.
- B. Provide onsite containers for the collection of waste materials, debris and rubbish. All waste materials including containers, food debris and other miscellaneous materials must be disposed of daily in onsite containers.
- C. Remove waste materials, debris and rubbish from the site periodically and dispose of at legal disposal areas away from the site.

3.02 FINAL CLEANING

- A. Employ skilled workmen for final cleaning.
- B. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces.
- C. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.
- D. Prior to final completion or Owner occupancy, Contractor shall conduct an inspection of sight-exposed interior and exterior surfaces and all work areas to verify that the entire Work is clean.

*** * END OF SECTION * ***

SECTION 01720
PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

Maintain at the site for the Owner one record copy of:

- A. Conformed Drawings.
- B. Conformed Specifications.
- C. Change Orders and other Modifications to the Contract.
- D. Engineer's Field Orders or written instructions.
- E. Approved Shop Drawings, Working Drawings and Samples.
- F. Field Test records.
- G. Construction photographs.
- H. Latest, Approved Progress Schedule.

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Store documents and samples in a manner and location to prevent damage.
 - 1. Provide files and racks for storage of documents.
 - 2. Provide secure storage space for storage of samples.
- B. File documents and samples in accordance with CSI section numbers.
- C. Maintain documents in a clean, dry, legible, condition and in good order. Do not use record documents for construction purposes.
- D. Make documents and samples available at all times for inspection by the Owner.
- E. As a prerequisite for monthly progress payments, the Contractor is to exhibit the currently updated "record documents" for review by the Owner.

1.03 MARKING DEVICES

Provide felt tip marking pens for recording information in the color code designated by the Owner.

1.04 RECORDING

- A. Label each document "PROJECT RECORD" with rubber stamp.
- B. Record information concurrently with construction progress and do not conceal any work until required information is recorded.
- C. Legibly mark drawings to record actual construction:
 - 1. The Contractor shall use the following color code in marking Contract Drawings:
 - a. Yellow for no change.
 - b. Red to indicate additions, deletions and changes.
 - 2. Elevations of various structure elements in relation to elevation datum.
 - a. Elevations referenced to control points established by the Owner's agent.
 - b. Specifically, elevations of drainage culvert inverts, ditch grades, top of roadway and driveway curbs, bridges, etc.
 - 3. Location of internal utilities and appurtenances concealed in the construction by referencing to visible and accessible features of the structure.
 - 4. Field changes of dimension and detail.
 - 5. Changes made by Field Order or by Change Order.
 - 6. Details not on original contract drawings.
- D. Specifications and Addenda; Legibly mark each Section to record:
 - 1. Manufacturer, trade name, catalog number, and Supplier of each Product and item of equipment actually installed.
 - 2. Changes made by Field Order or by Change Order.
- E. Shop Drawings (after final review):

-
- F. Certified site survey and line elevations and stationing at 100 foot increments and all points of change of direction of channel improvements (Section 01050) by a registered land surveyor.

1.05 SUBMITTAL

- A. At Contract close-out, deliver Record Documents to the Owner.
- B. Accompany submittal with transmittal letter in duplicate, containing:
1. Date.
 2. Project title and number.
 3. Contractor's name and address.
 4. Title and number of each Record Document.
 5. Signature of Contractor or his authorized representative.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION(NOT USED)

*** * END OF SECTION * ***

SECTION 01740

WARRANTIES AND BONDS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Compile specified warranties and bonds, as in Articles 5 and 13 of the General Conditions.
- B. Co-execute submittals when so specified.
- C. Review submittals to verify compliance with Contract Documents.
- D. Submit to the Owner for review.

1.02 SUBMITTAL REQUIREMENTS

- A. Assemble and include warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, couplers, and subcontractors including effective dates.
- B. Number of original signed copies required. Two (2) each.
- C. Table of Contents. Neatly typed in orderly sequence. Provide complete information for each item.
 - 1. Product or work item.
 - 2. Firm, with name of principal, address and telephone number.
 - 3. Scope.
 - 4. Date of beginning warranty, and bond.
 - 5. Duration of warranty.
 - 6. Provide information for Owner's personnel:
 - a. Proper procedure in case of failure.
 - b. Instances which might affect the validity of warranty or bond.
 - 7. Contractor, name of responsible principal, address and telephone number.

1.04 FORM OF SUBMITTALS

- A. Prepare in duplicate packets.
- B. Format:
 - 1. Size 8-1/2-inches x 11-inches, punch sheets for standard 3-post binder.
 - 2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS." List:
 - a. Title of Project.
 - b. Name of Contractor.
- C. Binders: Commercial quality, three-post binder, with durable and cleanable plastic covers and maximum post width of 2-inches, "D" ring.

1.05 WARRANTY SUBMITTAL REQUIREMENTS

- A. For all components of the work, unless stated otherwise in the specifications for each individual item of equipment, submit a written warranty from the manufacturer to replace promptly any component thereof which, in the sole opinion of the Engineer, has defects in design, workmanship, materials, or performance within a one (1) year period following the date of acceptance for operation (Substantial Completion) by the Owner. The manufacturer's warranty period shall be concurrent with the Contractor's for one (1) year, unless otherwise specified, commencing at the time of acceptance for operation (beneficial use) by the Owner and shall be read in conjunction with the Contractor's warranty which shall operate together to provide for replacement of defective components and restoration of proper operation. The Contractor shall be solely responsible for both warranties.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

*** * END OF SECTION * ***

SECTION 02050

DEMOLITION

PART 1 - GENERAL

1.01 Description

Scope: CONTRACTOR shall furnish all labor, materials, equipment and incidentals required for demolition, removal and disposal of Work shown and specified.

- A. Included, but not limited to, are demolition and removal of existing facilities, materials, equipment, or Work necessary to install the new Work as shown and specified and to connect same with existing Work in an approved manner. Demolition includes but is not limited to structural concrete, foundations, structural steel, masonry, attachments, appurtenances, piping, paving, curbs, walks, fencing, and similar existing facilities. Demolition also includes all types of saw cutting.
- B. Demolitions and removals which may be specified under other Sections shall conform to requirements of this Section.

1.02 Submittals

Schedule: Submit for approval proposed methods, equipment, and operations sequence. Include coordination for shut-off, capping, temporary services, continuation of utility services, and other applicable items to ensure no interruption of OWNER'S operations.

1.03 Job Conditions

- A. Protection:
 - 1. CONTRACTOR shall execute the demolition and removal of Work to prevent damage or injury to structures, occupants thereof and adjacent features which might result from falling debris or other causes, and so as not to interfere with the use, and free and safe passage to and from, adjacent structures.
 - 2. Closing or obstructing of roadways, sidewalks, and passageways adjacent to the Work by the placement or storage of materials will not be permitted, and all operations shall be conducted without interference to traffic on these ways.
 - 3. CONTRACTOR shall repair damage done to facilities to remain, or to any property belonging to the OWNER.
- B. Notification: At least 72 hours prior to commencement of a demolition or removal, CONTRACTOR shall notify the ENGINEER in writing of his proposed schedule therefore.
- C. Explosives: Do not bring explosives on site nor use explosive for demolition.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 General

- A. All materials and equipment removed from existing Work shall become the property of the CONTRACTOR, except for those which the OWNER has identified and marked to remain the property of the OWNER. All materials and equipment marked by the OWNER to remain its property shall be carefully removed by the CONTRACTOR so as not to be damaged, and then cleaned and stored on or adjacent to the site in a protected place specified by the ENGINEER or loaded onto trucks provided by the OWNER.
- B. CONTRACTOR shall dispose of all demolition materials, equipment, debris, and all other items not marked by the ENGINEER to remain the OWNER's property, off the site and in conformance with all existing applicable laws and regulations.
- C. Pollution Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit the amount of dust and dirt rising and scattering in the air to the lowest practical level. Comply with governing regulations pertaining to environmental protection.
 - 1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.
 - 2. Clean adjacent structures, facilities, and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to conditions existing prior to the start of the Work.
- D. Concrete Demolition: Unless otherwise approved by ENGINEER, proceed with demolition from the top of the structure to the ground.
 - 1. Demolish concrete and masonry in small sections.
 - 2. Remove structural framing members and lower to ground by means of hoists, derricks, or other suitable methods.
 - 3. Break up and remove foundations and slabs-on-grade, unless otherwise shown or specified to remain.
 - 4. Remove structures down to at least two feet below finished grade unless otherwise shown or specified.

**** END OF SECTION ****

SECTION 02200

EXCAVATION AND BACKFILL

PART 1 - GENERAL

1.01 Description

- A. Scope:
 - 1. Furnish all labor, materials, equipment and incidentals required to perform all excavating, backfilling and disposing of earth materials as shown, specified, and required for the purpose of constructing conduits, pipelines, roads, ditches, grading, and other facilities required to complete the Work in every respect.
 - 2. All necessary preparation of subgrade for slabs and pavements is included.
 - 3. All temporary means needed to prevent discharge of sediment to water courses because of dewatering systems or erosion is included.
 - 4. No classification of excavated materials will be made. Excavation includes all materials regardless of type, character, composition, moisture, or condition thereof.

1.01 Quality Assurance

- A. Tests:
 - 1. The CONTRACTOR shall retain the services of a qualified testing laboratory to make tests and determine acceptability of the fill or material as listed below.
 - 2. CONTRACTOR shall give full cooperation to the testing lab personnel so that the required soil tests can be taken in an efficient and timely manner.
 - 3. Required Tests:
 - a. Select Fill Samples:
 - (1) Gradation, ASTM D 422.
 - (2) Liquid Limit, ASTM D 423.
 - (3) Plastic Limit and Plasticity Index, ASTM D 424.
 - b. Compacted Select Fill: Compaction, ASTM D 698.
- B. Permits and Regulations:
 - 1. Obtain all necessary permits for work in roads, rights-of-way, railroads, etc.
 - 2. Obtain permits as required by local, state and federal agencies for discharging water from excavations to rivers and streams.
 - 3. Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

-
- C. Reference Standards: Comply with applicable provisions and recommendations of the following except as otherwise shown or specified.
1. ASTM A 36, Structural Steel.
 2. ASTM A 328, Steel Sheet Piling.
 3. ASTM D 422, Particle-Size Analysis of Soils.
 4. ASTM D 423, Liquid Limit of Soils.
 5. ASTM D 424, Plastic Limit and Plasticity Index of Soils.
 6. ASTM D 448, Standard Sizes of Coarse Aggregate for Highway Construction.
 7. ASTM D 698, Moisture-Density Relations of Soils, Using 5.5 lb (2.5 kg) Rammer and 12-in. (304.8 mm) Drop.
 8. ASTM D 1556, Density of Soil in Place by the Sand-Cone Method.
 9. ASTM D 2487, Classification of Soils for Engineering Purposes.
 10. ASTM D 2922, Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

1.02 Submittals

Submit samples of all select fill, gravel and base materials required.

1.03 Job Conditions

- A. Subsurface Information:
Not Included
- B. Existing Structures and Utilities:
1. Shown on the Drawings are certain surface and underground structures adjacent to the Work. This information has been obtained from existing records. It is not guaranteed to be correct or complete and is shown for the convenience of the CONTRACTOR. CONTRACTOR shall explore ahead of the required excavation to determine the exact location of all structures. They shall be supported and protected from injury by the CONTRACTOR. If they are broken or injured, they shall be restored immediately by the CONTRACTOR at his expense.
 2. Locate existing underground utilities in the areas of Work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult the ENGINEER immediately for directions as to procedure. Cooperate with City and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
 3. Do not interrupt existing utilities serving facilities occupied and used by the Owner or others, except when permitted in writing by ENGINEER and then only after acceptable temporary utility services have been provided.
- C. Use of Explosives: Not permitted on the job site.
- D. Protection of Persons and Property:
1. Barricade open excavations occurring as part of this Work and post with warning lights.
 2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
 3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards

created by earthwork operations.

- E. Dust Control: Conduct all operations and maintain the area of activities, including sweeping and sprinkling of roadways, so as to minimize creation and dispersion of dust. Use calcium chloride to control serious or prolonged dust problems.

PART 2 - PRODUCTS

2.01 Soil Materials

- A. Select Backfill and Fill Material: Comply with the following properties: Class B7-6 Borrow Material, as specified in Section 703.21 of the “*Mississippi Standard Specification for Road and Bridge Construction*”, 2004 Edition.
- B. Borrow Material: Comply with the following properties: Class B7-6 Borrow Material as specified in Section 703.21 of the “*Mississippi Standard Specification for Road and Bridge Construction*”, 2004 Edition.
- C. General Backfill and Fill Material: Provide approved soil materials for backfill and fill that meet the following requirements:
 - 1. Free of clay, rock or gravel larger than 6 inches in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter.
 - 2. Fill shall consist of any non-organic soil, free of debris and capable of being placed and compacted to the specified densities.
- D. Select Bedding Material: Select Bedding Material shall be Class B bedding, as specified in Section 603.03.2 of the “*Mississippi Standard Specification for Road and Bridge Construction*”, 2004 Edition.
- E. Sand Material for Undercuts: Sand Material for Undercuts shall be a clean sand having a maximum of 15% passing the No. 200 sieve.
- F. All costs associated with tests required by the ENGINEER to verify that material obtained either on-site or off-site meets the above requirements shall be borne by the CONTRACTOR.

PART 3 - EXECUTION

3.01 Inspection

CONTRACTOR will examine the areas and conditions under which excavating, filling, and grading are to be performed and notify the ENGINEER of conditions the CONTRACTOR may find that are detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in an acceptable manner.

3.02 Site Preparation

Clear all areas to be occupied by permanent construction of all trees, brush, roots, stumps, logs, wood and other materials and debris in accordance with Section 02100. Subgrades for fills shall be cleaned and stripped of vegetation, sod, topsoil and organic matter.

3.03 Test Pits

- A. Where ordered by the ENGINEER, excavate and backfill, in advance of construction, test pits to determine conditions or location of existing facilities.
- B. Perform all work required in connection with excavating, stockpiling, maintaining, sheeting, shoring, backfilling and replacing pavement for the test pits.
- C. Payment for this work will be included in the prices bid for the excavation work.
- D. Test pits made by the CONTRACTOR for his own use at his option shall not be paid for.

3.04 Excavation

- A. General:
 - 1. Scope: Perform all excavation required to complete the Work as shown and specified.
 - 2. Excavated Materials: Earth, sand, clay, gravel, hardpan, boulders not requiring drilling or jackhammering to remove, decomposed rock, pavements, sediment, rubbish and all other materials within the excavation limits.
- B. Structures and Pipelines:

Excavations: Open excavations shall be shored and braced where necessary. All shoring and bracing systems shall comply with current OSHA requirements.
- C. Dewatering:
 - 1. Placement of Structure Below Groundwater Table: Use well points, cofferdams or other acceptable methods to permit construction of said structure or pipeline under dry conditions.
 - 2. New Concrete and Pipelines: Maintain dry conditions until fresh concrete has reached sufficient strength to withstand earth and hydrostatic loads and until the pipelines are properly jointed, tested and backfilled.
 - 3. Flooding: Protect excavation from flooding until all walls and floor framing up to and including grade level floors are in place and backfilling has begun.
 - 4. Water Level: Maintain water level below top of backfill at all times.
 - 5. Under no conditions shall water be permitted to stand in the bottom of an excavation for more than 24 hours.
- D. Pumping: Pump excavations in such a manner to prevent the carrying away of unsolidified concrete materials, and to prevent damage to the existing subgrade.
- E. Size of Excavations: Extend excavation sufficiently on each side of structures, footings, etc., to permit setting of forms, installation of sheeting or the safe sloping of banks.
- F. Subgrades:

-
1. Subgrade Requirements for Roadways, and Trench Bottoms:
 - a. Strong, dense, and thoroughly compacted and consolidated.
 - b. Free from mud, muck and other soft or unsuitable materials.
 - c. Remain firm and intact under all construction operations.
 2. Soft Subgrades: For subgrades which are otherwise solid, but which become soft or mucky on top due to construction operations, overlay with geotextile fabric prior to placement of crushed stone or gravel. Fabric shall be as manufactured by one of the following:
 - a. Marifi 600X by Marifi, Inc.
 - b. Typar Style 3601 by Dupont Co.
 - c. Or equal.Install fabric in accordance with manufacturer's recommendations.
 3. Use "Mud-mat" for subgrade.
 4. Finished Elevation of Stabilized Subgrades: Do not place above subgrade elevations shown.
- G. Pipe Trench Preparation:
1. No more than 100 feet of trench may be opened in advance of pipe laying.
 2. Trench width shall be minimized to greatest extent practical but shall conform to the following:
 - a. Sufficient to provide room for installing, jointing and inspecting piping, but in no case wider at top of pipe than pipe barrel O.D. plus 3 feet.
 - b. Enlargements at pipe joints may be made if required and approved by ENGINEER.
 - c. Sufficient for sheeting, bracing, sloping, and dewatering.
 - d. Sufficient to allow thorough compacting of backfill adjacent to bottom half of pipe.
 - e. Do not use excavating equipment which requires the trench to be excavated to excessive width.
 3. Depth of trench shall be as shown. If required and approved by ENGINEER depths may be revised.
- H. Material Storage:
1. Stockpile satisfactory excavated materials in approved areas, until required for backfill or fill.
 2. Place, grade and shape stockpiles for proper drainage.
 3. Locate and retain soil materials away from edge of excavations.
 4. Dispose of excess soil and waste materials as specified hereinafter.
- I. Unsuitable Material:
1. Where the existing material beneath the bedding material is considered unsuitable by the ENGINEER, remove and replace it with select bedding material.
 2. Include the additional excavation and select bedding material as defined under Section 02200 when ordered in writing by the ENGINEER.

3.05 Unauthorized Excavation

- A. Limits: All excavation outside the lines and grades shown.
- B. Responsibility: All unauthorized excavation together with the removal and disposal of the associated materials is at the CONTRACTOR'S expense.
- C. Backfill: Fill and compact the unauthorized excavation with select backfill and at CONTRACTOR'S expense.

3.06 Drainage and Dewatering

- A. General:
 - 1. Prevent surface and subsurface water from flowing into excavations and from flooding adjacent areas.
 - 2. Remove water from excavation as fast as it collects.
 - 3. Maintain the ground water level below the bottom of the excavation to provide a stable surface for construction operations, a stable subgrade for the permanent work, and to prevent damage to the Work during all stages of construction.
 - 4. Provide and maintain pumps, sumps, suction and discharge lines and other dewatering system components necessary to convey water away from excavations.
 - 5. Obtain ENGINEER'S approval before shutting down dewatering system for any reason.
- B. Standby Requirements for Dewatering: Provide standby equipment to ensure continuity of dewatering operations.
- C. Disposal of Water Removed by Dewatering System:
 - 1. Dispose of all water removed from the excavation in such a manner as not to endanger public health, property, or any portion of the Work under construction or completed.
 - 2. Dispose of water in such a manner as to cause no inconvenience to the Owner, ENGINEER, or others involved in work about the site.
 - 3. Convey water from the construction site in a closed conduit. Do not use trench excavations as temporary drainage ditches.

3.07 General and Select Backfill

- A. General: Furnish, place and compact all backfill required for embankments and trenches as required to provide the finished grades shown and as described herein.
- B. Select: Provide select backfill in the following locations:
 - 1. Support below and around piping and foundations as noted on the Drawings.
 - 2. Subgrade for roads and pavements.
 - 3. Where shown or directed by ENGINEER.

-
- C. Restrictions: Backfill excavations as promptly as Work permits, but not until completion of the following:
1. Construction below finish grade including dampproofing, waterproofing, and perimeter insulation.
 2. Inspection, testing, approval, and recording of locations of underground utilities.
 3. Removal of concrete formwork.
 4. Removal of shoring and bracing, and backfilling of voids with satisfactory materials.
 5. Removal of trash and debris.
 6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.
- D. Placement:
1. Keep excavation dry during backfilling operations. At no time shall water be permitted to stand in the bottom of a trench for more than 24 hours.
 2. Bring up backfill evenly on all sides around structures and piping.
 3. For embankments it is intended that the elevations, lines, grades and typical sections (after settlement and compaction during construction) shall be those shown on the Drawings.
- E. Pipe Trenches:
1. Place all backfill in pipe trenches in horizontal layers not exceeding 6 inches in depth (loose thickness) and thoroughly compacted before the next layer is placed.
 2. Comply with requirements of Section 15052.
- F. Moisture:
1. The water content of the fill being compacted shall be within the range of plus 4 percentage points from the optimum moisture content of the material unless otherwise specified.
 2. Wet the fill materials during placement to achieve water contents needed for effective compaction.
- G. Unacceptable Material:
1. Do not place or compact fill in a frozen condition or on top of frozen material.
 2. Remove fill containing organic materials or other unacceptable material and replace with approved fill material.
- H. Equipment:
1. Compact fill with equipment suitable for the type of material placed and which is capable of providing the densities required.
 2. Select compaction equipment and submit it and proposed procedure to the ENGINEER for approval.
- I. Coverage:
1. Compact fill by at least two coverages of all portions of the surface of each lift by compaction equipment.
 2. One coverage is defined as the condition obtained when all portions of the surface of the fill material have been subjected to the direct contact of the compactor.
- J. Compaction: Minimum Density for General Backfill and Fill: CONTRACTOR shall provide independent analysis to demonstrate what value 95 and 98 percent of maximum
-

density obtained in the laboratory, in accordance with ASTM D 698 Method C including Note 2, is so that field density tests can be performed. This percentage is of standard Proctor density. Additional laboratory analyses will not be needed unless the material changes based upon Engineer's observations.

K. Inadequate Compaction:

1. If the specified densities are not obtained because of improper control of placement or compaction procedures, or because of inadequate or improperly functioning compaction equipment, perform whatever work is required to provide the required densities.
2. This work includes complete removal of unacceptable fill areas and replacement and recompaction until acceptable fill is provided.

L. Settlement:

1. Repair any settlement that occurs, at CONTRACTOR'S expense.
2. Make all repairs and replacements necessary within 30 days after notice from the ENGINEER or OWNER.

M. Disturbed Materials:

1. Provide, place and compact select fill necessary to replace subgrade materials disturbed and softened as a result of the CONTRACTOR'S operations or to backfill unauthorized excavation.
2. Furnish additional fill at CONTRACTOR'S expense.

3.08 Grading

A. General:

1. Uniformly grade areas within limits of grading under this Section, including adjacent transition areas.
2. Smooth subgrade surfaces within specified tolerances.
3. Compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

B. Compaction: After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification.

3.09 Gravel Course

A. General:

1. Place material to provide a total thickness of (6) six inches of drainage course under Reinforced Concrete Pipe sections and Flared End sections.
2. See other Sections of Division 2 for material specifications.

B. Grade Control: During construction, maintain lines and grades including crown and cross-slope of gravel course.

C. Shoulders:

1. Place shoulders along edges of gravel course to prevent lateral movement.
2. Construct shoulders of acceptable soil materials, placed in such quantity to compact

-
- to thickness of each gravel course layer.
 3. Compact and roll at least a 6 inch width of shoulder simultaneously with compacting and rolling of each layer of gravel course.

D. Placing:

1. Place gravel course material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness.
2. Maintain optimum moisture content for compacting gravel material during placement operations.
3. When a compacted gravel course is shown to be 6 inches thick or less, place material in a single layer.
4. When shown to be more than 6 inches thick, place material in equal layers, except no single layer more than 6 inches or less than 3 inches in thickness when compacted.

3.10 Disposal of Excavated Materials

A. Excess or Unsuitable Material:

1. Haul away from the project site all material removed from the excavations which does not conform to the requirements for fill or is in excess of that required for backfill.
2. Dispose of fill in compliance with municipal, county, state, federal or other applicable regulations at no additional cost to the OWNER.

3.11 Field Quality Control

A. Quality Control Testing During Construction:

1. Testing lab will inspect and approve subgrades and fill layers before further construction work is performed thereon
2. Tests of subgrades and fill layers shall be taken as follows:
 - a. Borrow Material/General Backfill/Select Backfill: Densities will be taken as specified in Section 203 of the "*Mississippi Standard Specification for Road and Bridge Construction*", 2017 Edition.

- B. Unsuitable Compaction: If, based on reports of testing lab and inspection, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional expense to the OWNER.

*** * END OF SECTION * ***

SECTION 02221

CRUSHED STONE, GRAVEL AND CLAY GRAVEL

PART 1 - GENERAL

1.01 Description

- A. Scope:
1. CONTRACTOR shall furnish and place crushed stone, gravel and clay gravel of the types specified at locations shown and as ordered by the ENGINEER.
 2. Work includes providing a gravel surface on a prepared subgrade as required for roadways, parking lots, and driveways.
- B. Related Work Specified Elsewhere: Section 02200, Excavation and Backfill.

1.02 Submittals

CONTRACTOR shall furnish representative samples of the crushed stone or gravel to the ENGINEER and shall advise of the source location.

1.03 Quality Assurance

Tests:

- A. Source Quality Control: CONTRACTOR shall be responsible for payment for all testing required to determine acceptability of crushed stone and gravel at the locations where the material is obtained.
- B. Field Quality Control Testing: The CONTRACTOR shall retain the services of a qualified testing laboratory to make tests and determine acceptability of the crushed stone and gravel upon delivery to the job site.
- C. CONTRACTOR shall give full cooperation to the testing lab personnel so that the required tests can be taken in an efficient and timely manner.

PART 2 - PRODUCTS

1.04 Materials

Crushed Stone:

- A. Material: Gradation Size No. 610 coarse aggregate as specified in Section 703.04.3 of the "Mississippi Standard Specification for Road and Bridge Construction", 2017 Edition.
- B. CONTRACTOR shall submit samples meeting the above requirements to an approved commercial testing laboratory for sieve analysis. The laboratory analysis results shall be approved by the ENGINEER before any material is ordered.

-
- C. After the materials are delivered to the job site, the ENGINEER will take two samples from each shipment of material. The CONTRACTOR shall have a sieve analysis performed on these samples by the CONTRACTOR's testing laboratory. If the results of the samples taken in the field do not conform to those previously approved, the material will be rejected and shall be modified or removed from the job site.
 - D. Crushed concrete meeting the requirements of Section 907-703.04.4 of the "*Mississippi Standard Specification for Road and Bridge Construction*", 2017 Edition may be used in lieu of other crushed courses specified in the contract.

PART 3 - EXECUTION

3.01 Inspection

Examine the subgrade on which the aggregate shall be installed and notify the ENGINEER in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the ENGINEER.

3.02 Roadway Installation

Construct in accordance with the "*Mississippi Standard Specifications for Road and Bridge Construction*," 2017 Edition.

3.03 General Placement of Crushed Stone, Gravel and Clay Gravel

Material shall be spread in layers of uniform thickness not exceeding six inches and shall be thoroughly compacted with suitable power driven tampers or other power driven equipment. The placing of crushed stone, gravel and clay gravel shall conform to applicable requirements of Section 02200 except as noted above.

*** * END OF SECTION * ***

SECTION 02270

SLOPE PROTECTION AND EROSION CONTROL

PART 1 - GENERAL

1.01 Section Includes

- A. Temporary and permanent erosion control systems.
- B. Slope Protection Systems.

1.02 Related Sections

- A. Section 02100, Clearing
- B. Section 02200, Excavation and Backfill
- C. Erosion Control Details
- D. Construction Requirements

1.03 Permits

Securing a permit (s) for storm water discharge associated with the Contractor's activity on any other regulated area the Contractor occupies, shall be the responsibility of the Contractor.

1.04 Environmental Requirements

The contractor shall meet the requirements of The USDA/Mississippi "Planning and Design Manual for the Control of Erosion, Sediment, and Stormwater" (first edition – April 1994) in addition to the Field Manual for Erosion and Sediment Control on Construction Site in Mississippi (second edition – 2005) in the implementation of erosion and sediment controls to protect adjacent properties and water resources from erosion and sediment damage throughout the life of the contract.

The maximum total acreage that can be disturbed, at one time, on the project is SEVENTEEN (17) acres. The Contractor shall be required to "stabilize" disturbed areas prior to opening up additional sections of the project. "Stabilized" shall be when the disturbed area has been grassed either temporary or permanent, and mulched according to the specifications. Disturbed areas include roadbeds, slopes, and other remaining areas within the project limits.

PART 2 - PRODUCTS

2.01 Materials

- A. Quick growing grasses such as wheat, rye or oats (See Section 02900).
- B. Fencing for siltation control as specified on the plans.

-
- C. Curlex blankets by American Excelsior Company or approved equal.
 - D. Temporary mulches such as loose hay, straw, netting, wood cellulose or agricultural silage.
 - E. Wattles
 - F. Triangular Silt Dikes
 - G. Sandbags
 - H. Inlet Siltation Guards.
 - I. Silt Basins
 - J. Turbidity Barriers.
 - K. Erosion and Siltation Control Plan

PART 3 - EXECUTION

3.01 Preparation

- A. Review site Erosion Control Plan. The Contractor shall submit to the Project Engineer for approval, a comprehensive Erosion and Siltation Control Plan utilizing temporary measures and permanent erosion control features to provide acceptable controls during all stages of construction.
- B. Erosion Control Plan (ECP) shall include (at a minimum) the following:
 - Plan sheets, 11"x17" or larger, of all areas within project site, showing locations of all temporary/permanent erosion control devices.
 - Detailed description of the proposed sequence of operations, but not limited to, clearing and grubbing, excavation, drainage, and structure installation.
 - Detailed description of best management practices (BMP) to be used to prevent siltation and erosion during sequence of operations.
 - A copy of the Certification for the Contractor's Certified Erosion Control Person whose primary duty shall be monitoring and maintaining the effectiveness of the ECP and compliance with the NPDES permit requirements. (THE CONTRACTOR'S SUPERINTENDENT CANNOT BE THE CERTIFIED EROSION CONTROL PERSON.)
 - Plan for disposal of waste materials within the project site which shall include but not be limited to:
 - Containment and disposal of materials from the cleaning (washing out) of concrete trucks that are delivering concrete to the project site.
 - Containment and disposal of fuel/petroleum materials at staging areas on the project.
 - The ECP shall be maintained for review on the project site at all times, updated as work progresses to show changes due to revisions in the sequences of construction operations, replacement of inadequate BMPs, and the maintenance of BMPs. Work shall not be started until and ECP has been approved by the Engineer. The Engineer will have the

authority to suspend all work and/or withhold payments for failure of the Contractor to carry out provisions of MDEQ's Storm Water Construction General Permit, the ECP, updates to the ECP, and/or proper maintenance of the BMPs.

- C. Deficiencies or changes in the Erosion Control Plan as it is applied to current conditions will be brought to the attention of the Engineer for remedial action.

3.02 Erosion Control and Slope Protection Implementation

- A. Prior to beginning any clearing and grubbing operations on the project, controls shall be in place to address areas such as drainage structures, wetlands, streams, steep slopes and any other sensitive areas as directed by the Engineer.
- B. The engineer has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and embankment operations and to direct the contractor to provide immediate permanent or temporary pollution control measures. The contractor will be required to incorporate all permanent erosion control features into the project at the earliest practical time to minimize the need for temporary controls. Cut slopes shall be permanently seeded and mulched as the excavation proceeds to the extent considered desirable and practical.
- C. The temporary erosion control systems installed by the contractor shall be maintained as directed by the engineer to control siltation at all times during the life of the contract. The contractor must respond to any maintenance or additional work ordered by the engineer within a 48-hour period.
- D. Disturbed areas that remain inactive for a period of more than thirty (30) days shall be temporary grassed and mulched. Temporary grassing and mulching shall be only paid one time for a given area.

****END OF SECTION****

SECTION 02790

CONCRETE TENNIS COURT SURFACE COLOR COATING SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Concrete tennis court surface color coating system.

1.2 RELATED REQUIREMENTS

- A. Section 03315-2 Post Tension Concrete Tennis Court

1.3 REFERENCE STANDARDS

- A. American Sports Builders Association (ASBA).
- B. United States Tennis Association (USTA) Rules of Tennis.
- C. International Tennis Federation (ITF).

1.4 SUBMITTALS

- A. Comply with Section 01330 (01 33 00) – Submittal Procedures.
- B. Product Data: Submit manufacturer's product data, including surface and crack preparation and application instructions.
- C. Samples: Submit manufacturer's color samples of color coating.
- D. Test Reports:
 - 1. Submit independent test results for solar reflectance index.
 - 2. Submit independent test results for 2000 Hour ASTM G154, accelerated weathering UV test, to demonstrate long-term durability and fade resistance.
 - 3. Submit independent test results for 2000 Hour, accelerated weathering ASTM G155 Xenon Arc test, to demonstrate long-term fade resistance and quality of pigment.
- E. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
- F. Manufacturer's Project References: Submit manufacturer's list of successfully completed concrete tennis court surface color coating system projects, including project name, location, and date of application.
- G. Applicator's Project References: Submit applicator's list of successfully completed concrete tennis court surface color coating system projects, including project name, location, type and quantity of color coating system applied, and date of application.

-
- H. Warranty Documentation: Submit manufacturer's standard warranty.

1.5 QUALITY ASSURANCE

- A. Manufacturer's Qualifications:
1. Manufacturer regularly engaged, for past 5 years, in manufacture of concrete tennis court surface color coating systems of similar type to that specified.
 2. United States owned company.
 3. Member: ASBA.
 4. Manufacturer has surfaces that are classified by the ITF's (International Tennis Federation) pace classification program.
- B. Applicator's Qualifications:
1. Applicator regularly engaged, for past 3 years, in application of tennis court surface color coating systems of similar type to that specified.
 2. Employ persons trained for application of tennis court surface color coating systems.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage and Handling Requirements:
1. Store and handle materials in accordance with manufacturer's instructions.
 2. Keep materials in manufacturer's original, unopened containers and packaging until application.
 3. Store materials in clean, dry area indoors.
 4. Store materials out of direct sunlight.
 5. Keep materials from freezing.
 6. Protect materials during storage, handling, and application to prevent contamination or damage.
 7. Close containers when not in use.

1.7 AMBIENT CONDITIONS

- A. Do not apply concrete tennis court surface color coating system when air or surface temperatures are below 50 degrees F during application or within 24 hours after application.
- B. Do not apply concrete tennis court surface color coating system when rain is expected during application or within 24 hours after application.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. As noted in plans or approved equal.

2.2 MATERIALS

- A. Concrete Tennis Court Surface Color Coating System: as noted in plans or approved equal.

-
- D. Patch Binder: Compatible with surface material
1. 100 percent acrylic emulsion liquid binder.
 2. Mix on-site with sand and cement.
 3. Levels and repairs low spots and depressions up to 3/4 inch deep in concrete pavement.
 4. Fills Cracks in concrete up to 1" in width.
 5. Weight per Gallon at 77 Degrees F: 8.8 lbs., plus or minus 0.5 lbs.
- E. Adhesion Promoter: Compatible with surface material
1. Acrylic emulsion primer.
 2. Primes concrete surface and promotes adhesion of color coating system materials.
 3. Weight per Gallon at 77 Degrees F: 8.7 lbs., plus or minus 0.5 lbs.
- F. Filler Course: Compatible with surface material
1. 100 percent acrylic emulsion resurfacer.
 2. Mix on-site with silica sand.
 3. Apply to adhesion promoter or previously colored acrylic surfaces in preparation of color coating system.
 4. Chemical Characteristics, by Weight, Minimum:
 - a. Acrylic Emulsion: 44.0 percent.
 - b. Hiding Pigment: 2.0 percent.
 - c. Mineral Inert Fillers: 5.0 percent.
 - d. Film Formers, Additives: 0.2 percent.
 - e. Water: 45.0 percent.
 5. Weight per Gallon at 77 Degrees F: 8.5 lbs., plus or minus 0.5 lbs.
 6. Non-Volatile Material: 27.5 percent, plus or minus 5.0 percent.
 7. Color: [Black] or [Neutral].
- G. Color Coating: as noted in drawings
1. 100 percent acrylic emulsion coating.
 2. Mix on-site with silica sand and water.
 3. Color coats tennis and multipurpose courts.
 4. Weight per Gallon at 77 Degrees F: 9.2 lbs., plus or minus 0.5 lbs.
 5. Color: [Beige] [Blue] [Brown] [Dark Green] [Dove Gray] [Forest Green] [Gray] [Ice Blue] [Light Blue] [Light Green] [Maroon] [Red] [Sandstone] [Tournament Purple] [Orange] [Yellow].
- H. Line Markings Primer: as noted in drawings
1. 100 percent acrylic emulsion primer, clear drying.
 2. Primes line markings and prevents bleed-under for sharp lines.
 3. Chemical Characteristics, by Weight, Nominal:
 - a. Acrylic Emulsion: 38.0 percent.
 - b. Hiding Pigment: 0.0 percent.
 - c. Mineral Inert Fillers: 7.0 percent.
 - d. Film Formers, Additives: 1.5 percent.
 - e. Water: 50.0 percent.
 4. Weight per Gallon at 77 Degrees F: 8.9 lbs., plus or minus 0.5 lbs.

-
5. Non-Volatile Material: 29 percent, plus or minus 5 percent.
- I. Line Paint: as noted in drawings
 1. Pigmented, 100 percent acrylic emulsion line paint.
 2. Line marking on concrete tennis courts.
 3. Chemical Characteristics, by Weight, Nominal:
 - a. Acrylic Emulsion: 25.89 percent.
 - b. Pigment: 14.90 percent.
 - c. Mineral Inert Fillers: 13.12 percent.
 - d. Additives: 4.73 percent.
 - e. Water: 41.36 percent.
 4. Weight per Gallon at 77 Degrees F: 10.65 lbs., plus or minus 0.75 lbs.
 5. Non-Volatile Material: 45.17 percent, plus or minus 5 percent.
 6. Color: White.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine concrete tennis court surfaces to receive color coating system.
- B. Verify:
 1. Suitable vapor barrier beneath concrete slab.
 2. Perimeter drainage to prevent moisture accumulation beneath concrete surface.
 3. Curing compounds have not been used on concrete surface.
 4. Concrete tennis courts meet ASBA requirements.
- C. Notify Architect of conditions that would adversely affect application or subsequent use.
- D. Do not begin surface preparation or application until unacceptable conditions are corrected.

3.2 SURFACE PREPARATION

- A. Protection of In-Place Conditions: Protect adjacent surfaces and landscaping from contact with concrete tennis court surface color coating system.
- B. Prepare surfaces in accordance with manufacturer's instructions.
- C. New Concrete:
 1. Cure new concrete surfaces a minimum of 28 days before application of concrete tennis court surface color coating system.
 2. Provide medium broom finish or similar roughened texture.
 3. Do not steel trowel finish.
 4. Acid etch surface per manufacturers specifications, then rinse thoroughly.
- D. Existing Concrete:
 1. Sandblast, shotblast, or scarify smooth concrete surfaces to roughened texture similar to medium broom finish.

2. Acid etch surface per manufacturers specifications, then rinse thoroughly.

- E. Remove dirt, dust, debris, oil, grease, sealers, curing compounds, vegetation, loose coatings, loose materials, and other surface contaminants which could adversely affect application of concrete tennis court surface color coating system. Pressure wash entire surface.
- F. Repair cracks, depressions, and surface defects in accordance with manufacturer's instructions before application of color coating.
- G. Repair spalled areas and level depressions 1/8 inch and deeper with patch binder in accordance with manufacturer's instructions.
- H. Apply adhesion promoter over entire concrete surface in accordance with manufacturer's instructions.
- I. Apply 1 coat of filler course to provide smooth underlayment for application of color coating.
- J. Ensure surface repairs are flush and smooth to adjoining surfaces.

3.3 APPLICATION

- A. Apply concrete tennis court surface color coating system in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Mix materials in accordance with manufacturer's instructions.
- C. Apply a minimum of 2 coats of color coating to prepared surfaces in accordance with manufacturer's instructions.
- D. Allow material drying times in accordance with manufacturer's instructions before applying other materials or opening completed surface to foot traffic.

3.4 LINE MARKINGS

- A. Lay out tennis court line markings in accordance with USTA Rules of Tennis.
- B. Apply line markings primer, after masking tape has been laid, to seal voids between masking tape and tennis court surface to prevent bleed-under when line paint is applied.
- C. Apply a minimum of 1 coat of line paint in accordance with manufacturer's instructions.

3.5 PROTECTION

- A. Allow a minimum of 24 hours curing time before opening tennis courts for play.
- B. Protect applied concrete tennis court surface color coating system to ensure that, except for normal weathering, coating system will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 02830
FENCES AND GATES

PART 1 C GENERAL

1.01 Description

- A. Scope:
 - 1. Furnish all labor, materials, equipment and such miscellaneous items as necessary for complete installation of a chain link fence system installed according to manufacturer's specifications unless otherwise indicated and specified herein.
 - 2. CONTRACTOR'S security fencing is at his option and expense and not specified herein.
- B. Related Work Specified Elsewhere:
 - 1. Section 03315, Concrete.

1.02 Quality Assurance

- A. Standards of Manufacture shall comply with the standards of the Chain Link Fence Manufacturer's Institute for "Vinyl Coated Chain Link Fence Fabric" and as herein specified.
- B. Provide each type of steel fence and gates as a complete unit produced by a single manufacturer, including necessary erection accessories, fittings and fastenings.
- C. Acceptable Manufacturers:
 - 1. Anchor
 - 2. Cyclone
 - 3. or equal
- D. Erector Qualifications: Minimum of two years experience installing similar fencing.

1.03 Submittals

- A. Product Data: Submit eight copies of manufacturer's technical data, in details of fabrication, and installation instructions and procedures for steel fences and gates. Transmit a copy of each instruction to the Installer. Submit to ENGINEER in conformance with all requirements of Section 01340.
- B. Samples: Submit three samples approximately 6-inches long, or 6-inches square of fabric material, framework members, and typical accessories.
- C. Certificates: Manufacturer's certification that materials meet specification requirements.

PART 2 C PRODUCTS

2.01 General

- A. Pipe sizes indicated are commercial pipe sizes.
- B. Tube sizes indicated are nominal outside dimension.
- C. H-section sizes are nominal flange dimensions.
- D. Roll-formed section sizes are the nominal outside dimensions (OD).

2.01 Fabric

- A. Fabric shall be 9 gauge steel wires, 2-inch diamond mesh; both top and bottom salvages twisted and barbed for fabric over 60-inches high. Finish, black vinyl coated.
- B. Site fencing to be 6 feet.

2.02 Posts, Rails and Braces

- A. End, Corner, and Pull Posts:
Furnish end, corner, and pull posts of the minimum sizes and weights as follows:
 - 1. Up to 5 foot fabric height.
 - a. 2.375-inch OD pipe weighing 3.65 pounds per linear foot.
 - b. 2.50-inch square tubing weighing 5.79 pounds per linear foot.
 - c. 3-1/2-inch x 3-1/2-inch roll-formed section weighing 5.14 pounds per linear foot.
 - 2. Over 5 foot fabric height.
 - a. 2.876-inch OD pipe weighing 5.79 pounds per linear foot.
 - b. 2.60-inch square tubing weighing 5.79 pounds per linear foot.
 - c. 3-1/2-in x 3-1/2-inch roll-formed section weighing 5.14 pounds per linear foot.
- B. Line Posts: Furnish line posts of the minimum sizes and weights as follows. Space posts 10 foot o.c. maximum, unless otherwise indicated.
 - 1. Up to 5 foot fabric height.
 - a. 1.90-inch OD pipe weighing 2.70 pounds per linear foot.
 - b. 1.875-inch x 1.625-inch roll-formed section weighing 2.70 pounds per linear foot.
 - 2. Over 5 foot fabric height.
 - a. 2.375-inch OD pipe weighing 3.65 pounds per linear foot
 - b. 2.25-inch x 1.70-inch roll-formed section weighing 4.10 pounds per linear foot.
- C. Gate Posts: Furnish gate posts for supporting single gate leaf, or one leaf of a double gate installation, for nominal gate widths as follows:
 - 1. Up to 6 feet wide.
 - a. 2.875-inch OD pipe weighing 5.79 pounds per linear foot.
 - b. 2-1/2-inch square tubing weighing 5.70 pounds per linear foot.

-
- c. 3-1/2-inch x 3-1/2-inch roll-formed section weighing 5.14 pounds per linear foot.
 - 2. Over 6 feet and up to 13 feet wide: 4-inch OD pipe weighing 9.10 pounds per linear foot.
 - 3. Over 13 feet and up to 18 feet wide: 6-5/8 inches OD weighing 18.97 pounds per linear foot.
 - 4. Over 18 feet wide: 8-5/8 inches OD weighing 24.7 pounds per linear foot.
- D. Top Rails shall be furnished unless otherwise indicated, of the following:
- 1. 1.660-inch OD pipe weighing 2.27 pounds per linear foot.
 - 2. 1.625-inch x 1.25-inch roll-form sections weighing 1.35 pounds per linear foot.
- E. Post Brace Assembly:
- 1. Furnish bracing assemblies at end and gate posts and at both sides of corner and pull posts, with the horizontal brace located at mid-height of the fabric.
 - 2. Use 1.660-inch OD pipe weighing 2.27 pounds per linear foot for horizontal brace and 3/8-inch diameter rod with turnbuckle for diagonal truss.
- F. Tension Wire: Furnish tension wire consisting of galvanized 7 gauge coiled spring wire. Locate at bottom of fabric only.
- G. Barbed Wire Supporting Arms: Not Required.
- H. Barbed Wire: Not Required.
- I. Post Tops: Post tops shall be pressed steel, wrought iron, or malleable iron of SG70A (or equivalent) of ASTM B-26 or B-108, designed as a weathertight closure cap (for tubular posts). Furnish one cap for each post unless equal protection is afforded by combination post top cap and barbed wire supporting arm, where barbed wire is required. Furnish caps with openings to permit through passage of top rail.
- J. Stretcher Bars: Stretcher bars shall be one piece lengths equal to full height of fabric, with a minimum cross-section of 3/16-inch x 3/4-inch. Provide one stretcher bar for each gate and end post, and two for each corner and pull post, except where fabric is integrally woven into the post.
- K. Stretcher Bar Bands: Stretcher bar band shall be steel, wrought iron, or malleable iron, spaced not over 15-inches on center, to secure stretcher bars to end, corner, pull, and gate posts.

2.03 Miscellaneous Materials and Accessories

- A. Wire Ties: For tying fabric to line posts, use 9 gauge wire ties spaced 12-inches o.c. For tying fabric to rails and braces, use 9 gauge wire ties spaced 24-inches o.c. For tying fabric to tension wire, use 11 gauge hog rings spaced 24-inches o.c. Finish ties to match fabric finish.
- B. Concrete: Provide concrete consisting of Portland cement complying with ASTM C 150 and Section 03315, aggregates complying with ASTM C 33, and clean water. Mix materials to obtain concrete with a minimum 28-day compressive strength of 2500 psi, using at least four sacks of cement per cubic yard, 1-inch maximum size aggregate, maximum 3-inch slump,

and two percent to four percent entrained air.

PART 3 C EXECUTION

3.01 Installation

- A. Fence installation shall not be started before the final grading is completed, with finish elevations established, unless otherwise permitted.
- B. Excavation: Drill holes of diameters and spacings shown, for post footings in firm, undisturbed or compacted soil.
 - 1. If not shown on the Drawings, excavate holes to the minimum diameters as recommended by fence manufacturer.
 - 2. Post holes shall be in true alignment and of sufficient size to provide a permanent foundation of concrete. Concrete shall be poured against undisturbed earth sides and bottom. All holes shall be 36-inches deep (minimum) with posts and corner posts placed in the concrete to a depth of 30-inches minimum, and the gate posts shall be set in the concrete to a depth of 42-inches below the surface when in firm, undisturbed soil. Holes shall be well-centered on the posts. A minimum diameter of 9-inches shall be required for all post holes.
 - 3. Remove excavated soil from the OWNER'S property.
 - 4. If solid rock is encountered near the surface, drill into rock at least 12-inches for line posts and at least 18-inches for end, pull, corner, and gate posts. Drill hole at least one-inch greater diameter than the largest dimension of the post to be placed.
 - 5. If solid rock is below solid overburden, drill to full depth required, except penetration into rock need not exceed the minimum depths specified above.
- C. Setting Posts: Remove loose and foreign materials from sides and bottoms of holes, and moisten soil prior to placing concrete.
 - 1. Center and align posts in holes three-inches above bottom of excavation.
 - 2. Place concrete around posts in a continuous pour, and vibrate or tamp for consolidation. Check each post for vertical and top alignment, and hold in position during placement and finishing operations. The top of concrete shall extend two-inches above finish grade.
 - 3. Trowel finish tops of footings, and slope or dome to direct water away from posts. Extend footings for gate posts to the underside of bottom hinge. Set keeps, stops, sleeves and other accessories into concrete as required.
 - 4. Keep exposed concrete surfaces moist for at least seven days after placement, or cure with membrane curing materials, or other acceptable curing method.
 - 5. Grout-in posts set into sleeved holes, concrete constructions, or rock excavations with non-shrink Portland cement grout, or other acceptable grouting material.
- D. Concrete Strength: Refer to Section 03315, Concrete.
- E. Top Rails: Run rail continuously through post caps or extension arms, bending to radius for curved runs. Provide expansion couplings as recommended by fencing manufacturer.
- F. Brace Assemblies: Install braces so posts are plumb when diagonal rod is under proper tension.

-
- G. Tension Wire: Install tension wires by weaving through the fabric and tying to each post with not less than 9 gauge galvanized wire, or by securing the wire to the fabric.
 - H. Fabric: Leave approximately three-inches between finish grade and bottom salvage, except where bottom of fabric extends into concrete. Pull fabric taut and tie to posts, rails, and tension wires. Install fabric on security side of fence, and anchor to framework so that fabric remains in tension after pulling force is released.
 - I. Repair damaged coatings in the shop or during field erection by recoating with manufacturer's recommended repair compounds, applied per manufacturer's directions.
 - J. Stretcher Bars: Thread through or clamp to fabric four-inches o.c., and secure to posts with metal bands spaced 15-inches o.c.
 - K. Barbed Wire: Install three parallel wires on each extension arm; on security side of fence, unless otherwise indicated. Pull wire taut and fasten securely to each extension arm.
 - L. Tie Wires: Use U-shaped wire, conforming to diameter of pipe to which attached, clasp pipe and fabric firmly with ends twisted at least two full turns. Bend ends of wire to minimize hazard to persons or clothing.
 - M. Fasteners: Install nuts for tension band and hardware bolts on side of fence opposite fabric side. Peen ends of bolts or score threads to prevent removal of nuts.
 - N. Electrical Grounding: Provide grounding rods every 100 feet along the fence. Requirements for grounding are specified in Section 16170.

*** * END OF SECTION * ***

SECTION 02920

GRASSING

PART 1 – GENERAL

1.01 Description

- A. Scope:
 - 1. CONTRACTOR shall furnish all labor, materials and incidentals required to establish a permanent stand of warm season grass as provided by the warranty specified herein. Grassing shall be established in all areas disturbed by CONTRACTOR during construction.
 - 2. If the Contractor fails to establish a warm season grass before a cool season grass becomes necessary then regrassing with a warm season grass as specified in Part 3.07 of this section will be required. A cool season grass may be required on the disturbed areas.
 - 3. The types of grassing work required include the following.
 - a. Topsoil stockpiled for reuse under Section 02200, Excavation and Backfill.
 - b. Seeded areas
 - c. Mulch seeded areas
 - d. Maintenance until completion of contract
 - e. Fertilizers
 - f. Guarantees
- B. Coordination: Review installation procedures under other Sections and coordinate the installations of items that must be installed with the grassing.
- C. Site Investigation: CONTRACTOR shall visit the job site and familiarize himself with the nature and location of the work, existing site conditions and conditions under which he will be obligated to perform the work listed herein.
- D. Related Work Specified Elsewhere:
 - 1. Section 02200, Excavation and Backfill

1.02 Quality Assurance

- A. Landscape Subcontractor Qualifications: Must be a licensed Landscape Contractor who will employ only experienced personnel who are familiar with the required work and will provide adequate supervision by a qualified foreman.
- B. Source Quality Control:
 - 1. General: Ship landscape materials with certificates of inspection as required by governmental authorities. Comply with governing regulations of the State of Mississippi and U.S. Department of Agriculture, circular No. 156 applicable to landscape materials.
 - 2. Analysis and standards: Package standard products with manufacturers certified analysis. For other materials, provide analysis by recognized laboratory made in

accordance with methods established by the Association of Official Analytical Chemists, wherever applicable or as further specified.

- C. Reference Standards: Comply with applicable provisions and recommendations of the following, except where otherwise shown or specified:
1. Mississippi Fertilizer Law: Rules and Regulations – MS Department of Agriculture and Commerce.
 2. Mississippi Pure Seed Law and Regulations – MS Department of Agriculture and Commerce.
 3. Association of Official Analytical Chemists, Official Methods of Analysis.
 4. American Joint committee on Horticultural Nomenclature, Standardized Plant Names.
 5. ASTM C 602, Agricultural Liming Materials.
 6. ASTM D 2487, Classification of Soils for Engineering Purposes.
 7. FSO-F-241D, Fertilizer, Mixed Commercial.
 8. FSO-P-166E, Peat Moss; Peat, Humus; and Peat. Reed-sedge.
 9. Official Seed Analysis of North America, Standards of Quality.

1.03 Submittals

- A. Shop Drawings: Submit for approval the following:
1. Planting schedule for landscape installation showing scheduled planting dates for each type of seed.
 2. Manufacturer's specifications and installation instructions for all materials required.
- B. Certificates: Submit for approval the following:
1. Certificates of inspection as may be required by governmental authorities to accompany shipments, and manufacturer's or vendors certified analysis for soil amendments and fertilizer materials. For standard products submit other data substantiating that materials comply with specified requirements.
 2. Certificates from seed vendors for each seed mixture required, stating botanical and common name, percentage by weight and percentages of purity, germination, and weed seed for each species.

1.04 Product Delivery, Storage and Handling

- A. Delivery of Materials: Do not deliver seed until site conditions are ready for planting.
1. Deliver packaged materials to the site in containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery.
 2. Furnish seed in sealed, standard containers each bearing the manufacturer's guaranteed analysis.
 3. Notify ENGINEER of delivery schedule in advance so landscape material may be inspected upon arrival at job site.
 4. Remove damaged and other unacceptable material immediately from job site.

-
- B. Storage of Materials:
 - 1. Store and cover materials to prevent deterioration. Remove packaged materials which have become wet or show deterioration or water marks from the site.
 - 2. Seed that is wet or moldy or that has been otherwise damaged in transit or storage is not acceptable. Replace at no further cost to OWNER.

1.05 Job Conditions

- A. Environmental Requirements:
 - 1. Proceed with and complete the work as rapidly as portions of the site become available, working within the seasonal limitations for each type of material required.
 - 2. Do not spread seed when wind velocity exceeds 5 miles per hour.
- B. Scheduling: Plant or install materials only during normal planting seasons. Correlate planting with specified maintenance periods to provide maintenance until occupancy by the OWNER.

1.06 Alternatives

Do not make substitutions. If specified landscape material is not obtainable, submit to ENGINEER proof of non-availability and proposal for use of equivalent material.

PART 2 – PRODUCTS

2.01 Materials

- A. Topsoil:
 - 1. Both on-site and off-site topsoil shall be approved by ENGINEER prior to use.
 - 2. If off-site topsoil is required a representative sample will be tested in accordance with on-site samples as shown in Appendix C.
 - 3. Fertile, friable, natural loam, surface soil, capable of sustaining vigorous plant growth, free of any admixture of subsoil, clods of hard earth, plants or roots, pests or pests larvae, sticks or other extraneous material harmful to plant growth.
 - 4. Organic content shall not be less than 5 percent, as determined by ignition loss.
- B. Grass Materials:
 - 1. Grass Seed Mixture: Provide fresh, clean, new-crop seed complying with the tolerance for purity and germination established by the Official Seed Analysts of North America. Provide seed of the grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified.
 - 2. Seed shall be delivered in bags as required by law. Each bag shall be tagged showing the percentage of germination, purity of the seed and percentage of noxious weeds and litter.
 - 3. Seed shall be free of wild onion, Canadian thistle and Johnson grass. One pound of seed shall not contain more than 300 noxious seeds.
 - 4. Seed older than 1 year will not be accepted.

5. The "Schedule of Grass Seed Requirements" is as follows:

Name of Grass	Purity	Germination	Application		Per Acre	
			May 1 to Aug. 15	Aug 15 to Sept 15	Sept. 15 to Feb 15	Feb 15 to May 1
Bermuda Grass	95%	90%	60 lbs (hulled)	30 lbs		60 lbs
Rye	95%	90%	--	60 lbs	60 lbs	30 lbs

6. Bermuda Grass shall be hulled Sunstar Improved Hybrid Bermuda as manufactured by LESCO or approved equal. Certification of seed required.
7. Rye Grass shall be an annual Rye Grass.

C. Solid Sod:

1. Type: Tifway (419) Hybrid Bermuda. Certification of sod required.
2. Sod shall be provided in large blocks or in rolls acceptable in size to the ENGINEER, free from ragged edges and with a minimum of 1-1/2 inch soil adhering firmly to the roots. Rolls shall be 30 to 42 inches in width.
3. Sod shall be free from obnoxious weeds and other grasses and shall not contain matter deleterious to its growth.
4. Sod shall be mowed within 24 hours proceeding cutting, and transplant with 24 hours from time of cutting, unless stacked in a manner acceptable to ENGINEER. **IN NO** event shall more than 3 days elapse between cutting and planting of sod.

D. Soil Amendments: Agricultural Lime: Natural limestone containing not less than 85 percent of total carbonates, ground so that not less than 90 percent passes a 10-mesh sieve and not less than 50 percent passes a 100-mesh sieve.

E. Fertilizers:

1. Commercial Fertilizer: Complete fertilizer of neutral character, with a minimum of 75 percent nitrogen derived from natural organic sources or urea form; 40-50 percent of the nitrogen shall be water soluble. Available phosphoric acid derived from superphosphate, bone, or tankage. Potash derived from muriate of potash, containing 60 percent potash. Uniform in composition, free flowing and suitable for application with approved equipment.
2. Provide the following types of fertilizers:
 - a. Combination Fertilizer: Minimum chemical analysis of nitrogen, phosphorus and potash of 13-13-13
 - b. Manufactured Fertilizer having a minimum chemical analysis of nitrogen, phosphorus and potash of 34-0-0:
 - 1) Ammonia nitrate 34-0-0
 - 2) Muriate of Potash 0-0-60

F. Mulch: Anti-Erosion Mulch: Provide clean, seed-free salt hay or threshed straw of wheat, rye, oats or barley, free from noxious weeds. Materials which are low grade and unfit for farm use such as "U.S. Sample Grade" are acceptable.

G. Water: Water shall not contain chemical or toxins which may be harmful.

PART 3 – EXECUTION

3.01 Soils Analysis

- A. Prior to planting grass seeds the Contractor shall make soil samples. One soil sample shall be obtained for every 10,000 square feet of area to be planted. Soil samples shall be tested for pH and nutrient deficiencies as tested in Appendix C. The Contractor shall use the results of the analysis and recommendations for applying fertilizers and agricultural lime, preplant and post plant.
- B. When off-site top soil is required, provide soil analysis prepared from samples taken from the excavation site. Provide two (2) samples per 1,000 cubic yards and have samples tested in same manner as on-site analysis shown in Appendix C.

3.02 Topsoil

- A. CONTRACTOR and his installer must install previously stripped topsoil if it meets the quality requirements listed in Part 2.01 and meets the Engineer's approval.
- B. When off-site topsoil is required, the Contract will collect samples taken from the site and have samples analyzed by the local county extension service prior to using on-site. If topsoil deficiencies are extreme, the Engineer may reject the off-site topsoil.

3.03 Soil Preparation

- A. Apply ground limestone, by machine, over all areas to receive seed, as required, at the rate required by the soil analysis, to bring the soil to a neutral pH. Work lightly into the top 3 inches of topsoil at least five days before applying the commercial fertilizers.
- B. Apply fertilizer by machine; over areas to receive turf at the rate determined in the soil analysis.
- C. Apply commercial fertilizers within 10 days of planting.
- D. Thoroughly and evenly incorporate fertilizer with the soil to depth of 3 inches by disking, or other approved method.
 - 1. In areas inaccessible to power equipment, use hand tools.
 - 2. Adjacent to existing trees, adjust depth to avoid disturbing roots.
- E. Grade planting areas to smooth, even surface with loose, uniformly fine texture. All finish grades shall be plus or minus 1" or .10 of a foot. Remove all stones and extraneous foreign material in excess of 1-inch diameter. Roll and rake and remove ridges and fill depressions, as required to meet finish grades. Limit fine grading to areas which can be planted immediately after grading.
- F. Moisten prepared planting areas before seeding if soil is dry. Water thoroughly and allow surface moisture to dry before planting. Do not create a muddy soil condition.

-
- G. Restore planting areas to specified condition if eroded or otherwise disturbed after fine grading and prior to seeding.

3.04 Installation

- A. General: Maintain grade stakes until removal is mutually agreed upon by all parties concerned.
- B. Seeding:
 - 1. Sow seed using a spreader or seeding machine.
 - 2. Distribute seed evenly over entire area by sowing equal quantity in 2 directions at right angles to each other. Do not sow seeds in windy weather.
 - 3. Sow not less than the quantity of seed specified.
 - 4. Cultipacker, or approved similar equipment, may be used to cover the seed and to firm the seedbed in one operation. In areas inaccessible to cultipacker:
 - a. Rake the seed lightly into top 1/8 inch of soil, roll in two directions with a water ballast roller, weighing not less than 100 pounds per linear foot.
 - b. Take care during raking that seed is not raked from one spot to another.
 - 5. Protect seeded areas against erosion by spreading specified lawn mulch after completion of seeding operations.
 - a. Spread anti-erosion mulch at a rate of 1-1/2 tons per acre to form a continuous blanket over seeded areas.
 - b. Place mulch with equipment that will punch controlled quantities of the mulch in a uniform pattern over the specified area. A mulch stabilizer shall be used, consisting of dull blades or disks without camber and approximately 20 inches in diameter. A farm disk will not be allowed as a replacement for a mulch stabilizer.
 - 6. Do not leave seeded areas unmulched for longer than 3 days. Reseed areas which remain without mulch for longer than 3 days.
 - 7. Prevent damage or staining of construction or other plantings adjacent to mulched areas.
 - 8. Prevent foot or vehicular traffic, or the movement of equipment, over the mulched area.
 - 9. Water seeded areas thoroughly with a fine spray.
- C. Sodding:
 - 1. Place on the approved prepared surface with edges in close contact, and starting at the lowest point and working upward.
 - 2. Close cracks between blocks of sod small pieces of fresh sod. Fill cracks too small for sod with a light dressing of approved soil.
 - 3. Compact and water sod area to the satisfaction of the Landscape Architect. Compact with light rollers, hand tamps or other approved equipment.
 - 4. Excavate so that the soil elevation of the sod meets flush with the seeded soil elevations where seeded areas join sodded areas.
 - 5. Peg with wooden pegs driven through the sod into firm earth at intervals deemed suitable to hold the sod in place, in areas where the sod may slide (due to the height and slope of the surface or nature of the soil).

-
- D. Reconditioning Existing Turf:
 - 1. Recondition existing turf areas damaged by CONTRACTOR'S operations including storage of materials or equipment and movement of vehicles. Also reconditioning existing turf areas where minor regrading is required.
 - 2. Water newly planted areas and keep moist until new turf is established.

3.05 Plant Establishment

- A. Seeding and Overseeding: Consists of protection of areas and operations of maintenance including watering, mowing, weeding, repairing, and reseeding of areas damaged or eroded as a result of the Contractor's operations, negligence, or by normal rains or storm, prior to acceptance.
- B. Sodding: Consists of preserving, protecting, replacing, watering, and maintenance necessary to keep the sod in satisfactory condition until acceptance.

3.06 Project Completion

- A. Clean-Up: Refer to Section 1710.
- B. Maintenance:
 - 1. Begins immediately after each plant and/or seeding is planted and continues until planting has passed final inspection and acceptance.
 - 2. Includes watering, weeding, cultivating, mowing, removal of dead materials, resetting plants to proper grades and other necessary operations. Lawn areas to receive watering at the rate of 1-1/2 inch per week.
 - 3. Fertilize lawn areas with specified fertilizers, pre-plant fertilizer (13-13-13), mid-post plant (34-0-0). After 14 days of pre-plant application and final post plant (13-13-13) 14 days after mid-post plant application, apply 1 lb. of Nitrogen per 1,000 sq. ft. per application.
 - 4. Mowing shall begin twenty-one days after planting and continue every seven days until final acceptance. Perform mowing with rotary or reel mowers – no bushhogs or flail mowers allowed. Mow and trim to a height of 1-1/2 inch.
 - 5. Provide protection to lawn areas. Repair damage resulting from construction operations promptly.
 - 6. Control weeds in lawn areas during maintenance period.
 - 7. Roll all lawn areas for smoothness.
- C. Maintenance by Owner:
 - 1. Owner will provide adequate maintenance during the guarantee period; however, Contractor shall fully explain the watering, and mowing needs of the work to the Owner in writing, submitted with the closeout documents.
 - 2. Contractor is responsible for planting until the guarantee period is up, unless the Owner is grossly negligent in his maintenance of the work.
 - 3. Maintenance by Owner shall not begin until final acceptance.

3.07 Guarantee, Inspection and Acceptance

- A. Inspection:
 - 1. Notify Engineer:
 - a. Prior to the days on which grassing operations are performed, and
 - b. To request final inspection.
 - 2. Made by Engineer at the conclusion of planting to determine completion, exclusive of replacement of plants.
- B. Final Acceptance:
 - 1. Final acceptance will be made by Owner following final inspection and approval by the Engineer.
 - 2. Where seeding is included, will not be made for a minimum period of 21 calendar days after permanent grass seeding and until seed have germinated and are growing in a satisfactory stand.
 - 3. A satisfactory stand of grass is a cover of living grass (limited to the species of seed or sod which is expected to germinate in the current season), in which no gaps greater than 6 inches occur in seeded areas and no gaps occur in sodded areas.
 - 4. If an acceptable stand of grass is not established within 45 calendar days from date of planting, the area shall be reseeded or repaired (at no cost to the Owner) until an acceptable stand is established. Deficiencies in the work must be corrected before final acceptance will be made.
- C. Guarantee:
 - 1. Period – 60 days, BEGINNING at the time of FINAL acceptance.
 - 2. Grass shall be alive, in a satisfactory condition, and growth for each specified species of plant at the end of the guarantee period, unless the plant material has suffered from direct damage or negligence by the Owner.
 - 3. Grass damaged directly or indirectly as a result of the Work prior to final acceptance of the complete project, shall be replaced.
 - 4. Refer to warranty requirements of sod (paragraph 2.04C).
- D. Reports by Landscape Contractor:
 - 1. Beginning at final acceptance and during the guarantee period, make periodic inspections of the work to verify minimal maintenance by Owner.
 - 2. Inspections shall be made once every 30 days. File a written report with the Owner and the Engineer.
 - 3. Failure to do so shall relieve the Owner of his maintenance requirements during the guarantee period.
- E. Replacement – Warranty:
 - 1. Grassing required under this contract which is dead or not in satisfactory condition during, or at the end of the guarantee period, as determined by the Engineer, shall be removed and replaced, at the Contractor's expense, provided that:
 - a. Owner has complied with the instructions for maintenance provided by the Contractor, and
 - b. The 30-day reports by the Contractor are on file with the Engineer.
 - 2. Notify the Engineer when planning to replace the grass so that the Engineer or Owner may be present.

-
3. Replacement plants shall be of the same variety and species installed, unless directed otherwise by the Engineer.

3.08 Re-Grassing Requirement

- A. This requirement is for the purpose of installing the desired stand of warm season grass, which could not be established if planted in the period of August 16 to May 1.
- B. This requirement is not covered under the specified construction period and does not provide for liquidated damages; however the Owner reserves the right to assess applicable damages to the Contractor if the re-grassing operation has not been completed by June 1 of the succeeding grassing season, following the completion of other components of this project.
- C. Grassing operations performed in the period beginning August 16, and continuing to May 1:
 1. Re-seed and re-fertilize project area designated to be seeded, if an acceptable stand of warm season grass has not been achieved, as determined by the Owner and Engineer on or around May 1.
 2. Re-grassing operations shall require fill as required due to erosion, scarifying, fertilization, and grassing, all as per this Section. Mulch bare areas greater than 3 feet by 3 feet.

**** END OF SECTION****

SECTION 03315-1

CONCRETE

PART 1 - GENERAL

1.01 Description

- A. Scope: CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and install cast-in-place concrete reinforcement and related materials.
- B. Coordination: Review installation procedures under other Sections and coordinate the installation of items that must be installed in the concrete.

1.02 Quality Assurance

- A. Source Quality Control:
 - 1. Concrete Testing Service:
 - a. CONTRACTOR shall employ acceptable testing laboratory to perform materials evaluation, testing and design of concrete mixes.
 - b. CONTRACTOR'S laboratory shall also evaluate concrete delivered to and placed at the site.
 - 2. Certificates, signed by concrete producer and CONTRACTOR, may be submitted in lieu of material testing when acceptable to ENGINEER.
 - 3. Quality Control: Perform sampling and testing during concrete placement, as follows:
 - a. Sampling: ASTM C 172.
 - b. Slump: ASTM C 143, one test for each load at point of discharge.
 - c. Air Content: ASTM C 31, one for each set of compressive strength specimens.
 - d. Compressive Strength: ASTM C 39, first load and then one set for each 50 cubic yards or fraction thereof for each class of concrete; 1 specimen tested at 7 days, 2 specimens tested at 28 days.
 - 4. Report test results in writing to ENGINEER on same day tests are made.
- B. Reference Standards: Comply with the applicable provisions and recommendations of the following, except as otherwise shown or specified.
 - 1. ACI 301, Specifications for Structural Concrete for Building (includes ASTM Standards referred to herein except ASTM A 36).
 - 2. ACI 347, Recommended Practice for Concrete Formwork.
 - 3. ACI 304, Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete.
 - 4. ACI 315, Manual of Standard Practice for Detailing Reinforced Concrete Structures.
 - 5. ACI 305, Recommended Practice for Hot Weather Concreting.
 - 6. ACI 306, Recommended Practice for Cold Weather Concreting.
 - 7. ASTM A 36, Structural Steel.
 - 8. Concrete Reinforcing Steel Institute, Manual of Standard Practice, include ASTM Standards referred herein.

1.03 Submittals

-
- A. Samples: Submit samples of materials as specified and may be requested by the ENGINEER including names, sources and descriptions.
 - B. Shop Drawings: Submit the following for approval in accordance with Shop Drawing Procedures Section 01340 and the General Requirements and with additional requirements as specified.
 - 1. Copies of manufacturer's specifications with application and installation instructions for proprietary materials and items, including admixtures and bonding agents.
 - 2. Drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315, Chapters 1 thru 8. For walls, show elevations to a minimum scale of 3 inch to 1 foot. Show bar schedules, stirrup spacing, diagrams of bent bars, arrangements and assemblies, as required for the fabrication and placement of concrete reinforcement.
 - 3. List of concrete materials and concrete mix designs proposed for use. Include the results of all tests performed to qualify the materials and to establish the mix designs in accordance with ACI 301, 3.9. Submit written report to ENGINEER for each proposed concrete mix at least 15 days prior to start of Work. Do not begin concrete production until mixes have been reviewed and are acceptable to ENGINEER. Mix designs may be adjusted when material characteristics, job conditions, weather, test results or other circumstances warrant. Do not use revised concrete mixes until submitted to and accepted by ENGINEER.
 - C. Laboratory Test Reports: Submit copies of laboratory test reports for concrete cylinders, materials and mix design tests. Production of concrete to comply with specified requirements is the responsibility of the CONTRACTOR.

1.04 Product Delivery, Storage and Handling

- A. Deliver concrete reinforcement materials to the site bundled, tagged and marked. Use metal tags indicating bar size, lengths, and other information corresponding to markings shown on placement diagrams.
- B. All materials used for concrete must be kept clean and free from all foreign matter during transportation and handling and kept separate until measured and placed in the mixer. Bins or platforms having hard clean surfaces shall be provided for storage. Suitable means shall be taken during hauling, piling and handling to insure that segregation of the coarse and fine aggregate particles does not occur and the grading is not affected.

PART 2 - PRODUCTS

2.01 Concrete Materials

- A. Portland Cement: ASTM C 150, Type I/II.
- B. Aggregates: ASTM C 33.
 - 1. Fine Aggregate: Clean, sharp, natural sand free from loam, clay, lumps or other deleterious substances. Dune sand, bank run sand and manufactured sand are not acceptable.
 - 2. Coarse Aggregate: Clean, uncoated, processed aggregate containing no clay, mud,

loam, or foreign matter, as follows:

- a. Crushed stone, processed from natural rock or stone.
- b. Washed gravel, either natural or crushed. Use of slag and pit or bank run gravel is not permitted.

- C. Coarse Aggregate Size: Size to be ASTM C 33, Nos. 57 or 67, unless permitted otherwise by ENGINEER.
- D. Water: Clean, potable.
- E. Air-Entraining Admixture: ASTM C 260.
- F. Water-Reducing Admixture: ASTM C 494. Only use admixtures which have been tested and accepted in mix designs.
- G. Slump Limits: Proportion and design mixes to result in concrete slump at the point of placement of not less than one inch and not more than four inches.

2.02 Form Materials

- A. Provide Form materials with sufficient stability to withstand pressure of placed concrete without bow or deflection.
- B. Exposed Concrete Surfaces: Acceptable panel-type to provide continuous, straight, smooth, as-cast surfaces. Use largest practical sizes to minimize form joints.
- C. Unexposed Concrete Surfaces: Suitable material to suit project conditions.
- D. Provide : 3/4 inch chamfer at all exposed corners.

2.03 Reinforcing Materials

- A. Reinforcing Bars: ASTM A 615, Grade 60.
- B. Welded Wire Fabric: ASTM A 185.
- C. Steel Wire: ASTM A 82.
- D. Fiber Reinforced Concrete: ASTM C 116.
- E. Supports for Reinforcement: Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcement in place.
 - 1. Use wire bar type supports complying with CRSI recommendations, except as specified below. Do not use wood, brick, or other unacceptable materials.
 - 2. For slabs on grade, use supports with sand plates or horizontal runners where base materials will not support chair legs.
 - 3. For all concrete surfaces, where legs of supports are in contact with forms, provide supports complying with CRSI, Manual of Standard Practice as follows:
 - Either hot-dip galvanized, plastic protected or stainless steel legs.

2.04 Grout

-
- A. Non-metallic, 100 percent solids, high strength epoxy grout.
 - 1. Use clean well graded sand with epoxy resins suitable for use on dry or damp surfaces.
 - 2. Product and Manufacturer: Provide one of the following:
 - a. Euco High Strength Grout by the Euclid Chemical Company.
 - b. Sikadur 42 Grout by Sika Chemical Company.
 - c. Five Star Epoxy Grout by U.S. Grout Corporation.
 - d. Or equal.
 - B. Nonshrink, Nonmetallic Grout:
 - 1. Premixed nonstaining cementitious grout requiring only the addition of water at the job site.
 - 2. Product and Manufacturer: Provide one of the following:
 - a. Euco N-S by the Euclid Chemical Company.
 - b. Masterflow 713 by Master Builders Company.
 - c. Five Star by U.S. Grout Corporation.
 - d. Or equal.
 - C. Ordinary Cement-Sand Grout: Except where otherwise specified use 1 part cement to 3 parts sand complying with the following:
 - 1. Cement: ASTM C 150, Type II.
 - 2. Sand: ASTM C 33.
 - D. Concrete Grout for Riprap:
 - 1. Cement: ASTM C150, Type II
 - 2. Sand: ASTM C33
 - 3. Coarse Aggregate: ASTM C33, Size No. B.
 - 4. The Concrete Grout design mix shall be as follows:
 - a. Cement.....564 lb. Per C.Y.
 - b. Fine Aggregate.....1,616 lb. Per C.Y.
 - c. Coarse Aggregate.....1,248 lb. Per C.Y.
 - d. Water.....4 gal. per C.Y.
 - 5. Where water repelling and shrinkage reducing requirements are shown or specified, use admixtures.
 - 6. Product and Manufacturer: Provide one of the following:
 - a. Integral Waterpeller by the Euclid Chemical Company
 - b. Omicron, Type OM by Master Builders Company.
 - c. Hydrocide Powder by Sonneborn-Contech
 - d. Or equal.

2.05 Expansion Joints

- A. Expansion joint filler shall be preformed expansion joint filler complying with ASTM D1752, Type II cork.
- B. Expansion joint sealer:
 - 1. Exterior and Interior Joints in Horizontal Planes: Two-Component Polyurethane Sealant:
 - a. Polyurethane-based, 2-part elastomeric sealant complying with the following:

-
- (1) FS TT-S-00227, Type 1 (self-leveling) Class A.
 - (2) Water Immersion Bond, FS TT-S-00227; Elongation of 25 percent with no adhesive failure.
 - (3) Hardness (Standard Conditions), ASTM C 661: 30-40.
 - (4) Stain and Color Change, FS TT-S-00227 and ASTM C 510: No discoloration or stain.
 - (5) Accelerated Aging, ASTM C 793: No change in sealant characteristics after 250 hours in weatherometer.
- b. Product and Manufacturer: Provide one of the following:
- (1) Sonolastic Paving Joint Sealant by Sonneborn Division of Contech Incorporated.
 - (2) Vulkem 255 by Mameco International.
 - (3) Or equal.

PART 3 - EXECUTION

3.01 Inspection

CONTRACTOR and his installer shall examine the substrate and the conditions under which Work is to be performed and notify ENGINEER of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to ENGINEER.

3.02 Formwork

- A. Formwork: Construct so that concrete members and structures are correct size, shape, alignment, elevation and position, complying with ACI 347.
- B. Provide openings in formwork to accommodate Work of other trades. Accurately place and securely support items built into forms.
- C. Clean and adjust forms prior to concrete placement. Apply form release agents or wet forms, as required. Retighten forms during and after concrete placement if required to eliminate mortar leaks.

3.03 Reinforcement, Joints, and Embedded Items

- A. Comply with the applicable recommendations of specified codes and standards, and CRSI, Manual of Standard Practice, for details and methods of reinforcement placement and supports.
- B. Clean reinforcement to remove loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.
- C. Position, support, and secure reinforcement against displacement during formwork construction or concrete placement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.
 - 1. Place reinforcement to obtain the minimum concrete converges as shown and as specified in ACI 318. Arrange, space, and securely tie bars and bar supports together with 16 gage wire to hold reinforcement accurately in position during

-
- concrete placement operations. Set with ties so that twisted ends are directed away from exposed concrete surfaces.
2. Reinforcing steel shall not be secured to forms with wire, nails or other ferrous metal. Metal supports subject to corrosion shall not touch formed or exposed concrete surfaces.
- D. Provide sufficient numbers of supports of strength required to carry reinforcement. Do not place reinforcing bars more than 2 inches beyond the last leg of any continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.
- E. Splices: Provide standard reinforcement splices by lapping ends, placing bars in contact, and tying tightly with wire. Comply with requirements shown for minimum lap of spliced bars.
- F. Install welded wire fabric in as long lengths as practical, lapping at least one mesh.
- G. Concrete shall not be placed until the reinforcing steel is inspected and permission for placing concrete is granted by ENGINEER. All concrete placed in violation of this provision will be rejected.
- H. Joints: Provide construction, isolation, and control joints as indicated or required. Locate construction joints so as to not impair the strength and appearance of the structure. Place isolation and control joints in slabs on ground to stabilize differential settlement and random cracking.
- I. Installation of Embedded Items: Set and build into the Work anchorage devices and embedded items required for other Work that is attached to, or supported by cast-in-place concrete. Use setting diagrams, templates and instructions provided under other Sections and other contracts for locating and setting. Refer also to Paragraph 1.01.B., Coordination, above.

3.04 Concrete and Placement

- A. Proportioning and Design of Mix:
1. Concrete shall meet the requirements of Class "B" Concrete as specified in Section 804 of the *"Mississippi Standard Specifications for Road and Bridge Construction"*, 2017 Edition
 2. Calcium Chloride: Do not use calcium chloride in concrete, unless otherwise authorized in writing by ENGINEER. Do not use admixtures containing calcium chloride.
- B. Job-Site Mixing: Use drum type batch machine mixer, mixing not less than 12 minutes for one cubic yard or smaller capacity. Increase mixing time at least 15 seconds for each additional cubic yard or fraction thereof.
- C. Ready-Mixed Concrete: ASTM C 94.
- D. Concrete Placement: Comply with ACI 304, placing concrete in a continuous operation within planned joints or sections. Do not begin placement until work of other trades affecting concrete is completed.
- E. Consolidate placed concrete using mechanical vibrating equipment with hand rodding and
-

tamping, so that concrete is worked around reinforcement and other embedded items and into all parts of forms.

- F. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placement, and curing.
 - 1. In cold weather comply with ACI 306.
 - 2. In hot weather comply with ACI 305.

3.05 Quality of Concrete Work

- A. Make all concrete solid, compact and smooth, and free of laitance, cracks and cold joints.
- B. Cut out and properly replace to the extent ordered by the ENGINEER, or repair to the satisfaction of the ENGINEER, surfaces which contain cracks or voids, are unduly rough, or are in any way defective. Patches or plastering will not be acceptable.
- C. Repair, removal, and replacement of defective concrete as ordered by the ENGINEER shall be at no additional cost to the OWNER.

3.06 Curing

Begin initial curing after placing and finishing concrete as soon as free water has disappeared from exposed surfaces. Where possible, keep continuously moist for not less than 72 hours. Continue curing use of moisture-retaining cover or membrane-forming curing compound. Cure formed surfaces by moist curing until forms are removed. Provide protection as required to prevent damage to exposed concrete surfaces.

3.07 Finishes

- A. Finish:
 - 1. After placing concrete slabs, do not work the surface further until ready for floating. Begin floating when the surface water has disappeared or when the concrete has stiffened sufficiently. Use a wood float only. Check and level the surface plane to a tolerance not exceeding 3 inch in 10 feet when tested with a 10 foot straightedge placed on the surface at not less than 2 different angles. Cut down high spots and fill all low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat the surface to a uniform, smooth, granular texture.
 - 2. After floating, begin the first trowel finish operation using a trowel. Begin final troweling when the surface produces a ringing sound as the trowel is moved over the surface.

-
3. Consolidate the concrete surface by the final hand troweling operation. Finish shall be free of trowel marks, uniform in texture and appearance, and with a surface plane tolerance not exceeding 1/8 inch in 10 feet when tested with a 10 foot straight edge. Grind smooth surface defects.
 4. Use trowel finish for the following: Interior exposed slabs unless otherwise shown or specified.
 5. Apply non-slip broom finish to exterior concrete slab and elsewhere as shown on the Drawings.

3.08 Grout Placement

- A. General:
 1. Place grout as shown and in accordance with manufacturer's instructing. If manufacturer's instructions conflict with the Specifications do not proceed until CONTRACT OFFICER provides clarification.
 2. Drypacking will not be permitted.
 3. Manufacturers of proprietary products shall make available upon 72 hours notification the services of a qualified, full-time employee to aid in assuring proper use of the product under job conditions.
 4. Placing grout shall conform to the temperature and weather limitations described in Article 3.04 above.

*** * END OF SECTION * ***

SECTION 16010

GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 Governing Clause

The phrase "CONTRACTOR shall furnish and install" unless specified or indicated otherwise, shall be omitted for the sake of brevity in these specifications. However, these phrases are implied. Any mention of material and/or operations in the specifications or drawings will require CONTRACTOR to furnish and install such materials and perform each and every operation required for a complete and operable system and to the complete satisfaction of the ENGINEER. The drawings are diagrammatic and may not necessarily show each and every wire, conduit, conduit routing, junction electrical box and/or final connection required for all pieces of equipment. However, the intent of this paragraph is to require that the CONTRACTOR furnish labor and materials to make all required final electrical power connections whether or not shown to all equipment shown on the drawings issued as bidding documents for this project.

1.02 General Conditions

- A. General Conditions, Supplementary General Conditions, Information to Bidders, General Requirements, Special Conditions, Addenda, Wage Rates, and other pertinent documents issued under these specifications and shall be complied with in every respect as though fully written herein.
- B. Notwithstanding Any Reference in the Specifications to Any Article, Device, Product, material, fixture, form or type of construction by name, make or catalog number, such reference shall be interpreted as establishing a standard of quality and performance and shall not be construed as limiting competition; and in such cases, may at his option use any article, device, product, material, fixture, form or type of construction which in the final judgment of the ENGINEER expressed in writing, is an approved equal to that specified.

1.03 Record Drawings and Operating and Maintenance Manuals

Furnish to the ENGINEER at job acceptance and completion, the following in compliance with Section 01720:

- A. Record Drawings: One set of blue line prints marked in black, showing an accurate location of all variations of the work actually installed related to the original drawings. The drawings shall include all approved and installed Change Orders, field condition changes, and other variations from the original plans and specifications.
- B. Operation and Maintenance Manuals: Furnish three copies of an operation and maintenance manual for each electrical system and for each piece of equipment. Three copies of the complete manuals bound in a 3-inch, 3-ring black binder with color coded tabs as directed by the ENGINEER labeling all shop drawings, approved manufacturers brochures, control diagrams, maintenance instructions and other data required by the contract documents

reflecting the record fabrication and installation of all systems or equipment installed. One manual shall be furnished prior to the time that the system or equipment tests are performed. The remaining two manuals shall be furnished to the ENGINEER before the contract is closed out.

- C. The following identification shall be inscribed in minimum : "-high alphabet type letters on the outside front corner: The words "OPERATING AND MAINTENANCE MANUAL", the name and location of the project and the contract number. The manual shall include the names, addresses, and telephone number of each subcontractor. Installing equipment and systems, the local manufacturer's representative for each item of equipment and each system. This information shall be contained on the first page of the binder. Lettering shall be permanent signage and not stick-on type.
- D. The manual shall have a typewritten table of contents with the tab sheets placed before instructions covering the subject. The instruction sheets shall be legible with large sheets of drawings folded in. The manual shall include a system layout showing circuits, devices, and controls; control diagrams with explanation of operation and control of each component; start-up control sequence, and operation; a detailed description of the function of each principal component of the system; the procedure for starting; the procedure for operating; shut-down instructions; installation instructions, maintenance and overhaul instructions; lubrication schedule including type, grade, illustrations; test procedures; performance data; and parts list. The parts list for equipment shall indicate the sources of supply, recommended spare parts, and the service organization which is reasonably convenient to the site. The manual shall be complete in all respects for all equipment, controls, and accessories provided.

1.04 Tests and Inspections

The complete job shall be, during actual construction, and for the warranty provision period, subject to the supervision of the ENGINEER and will have the following tests and inspections conducted without any additional cost to the contract.

- A. By ENGINEER'S inspections and tests conducted by him or for him in his presence. Upon written notice, CONTRACTOR shall furnish not to exceed two men, one to include the job foreman and tools to assist and be directed by the ENGINEER for a reasonable amount of time to make such tests and inspections as are requested by the ENGINEER pertaining to the safety and operation of any device or system installed.
- B. By complete insulation break-down tests with a megger of each and every branch circuit, and service entrance. All 600 volt conductors shall meet a minimum of resistance of 1,000,000 OHMS. Tests shall be performed prior to any connections to overcurrent devices, devices or equipment. All readings shall be made in the ENGINEER'S presence or his authorized representative and a type-written report of same submitted to him before the job is subject to his approval. The manufacturer, cat. no. and type or megger shall be noted on the report.
- C. By any federal, state or local authority having jurisdiction of the project.

-
- D. By the Mississippi State Rating Bureau. After inspection by this agency, corrections of any deficiencies shall be made which were found adversely affecting the insurance to be carried by the OWNER. Acceptance of the Rating Bureau's report or subsequent reports lie with the ENGINEER or OWNER. Electrical contractor/subcontractor shall pay all cost for this work.
 - E. Properly phase out the entire electrical system to balance all loads as close as possible.
 - F. Certified Test Reports: Before any equipment or materials are delivered to the project site, certified copies of all test reports specified in the individual sections of this specification shall be submitted to the ENGINEER for his approval.

1.05 Guarantee

- A. Guarantee to the OWNER all work performed and all equipment installed under this contract shall be free from defects in workmanship and materials for a period of one year unless noted otherwise from date of final written acceptance by the ENGINEER and the OWNER.
- B. Defects shall be corrected arising during this one year period at the CONTRACTOR'S own expense, upon written notice of the OWNER or his authorized representative.

1.06 General Information

- A. Plans are diagrammatic. Judgment and care shall be exercised to install all electrical work in a practical manner which shall function properly and fit the construction and finishes. Electrical devices not shown or specified which shall be required or any device or system to produce a complete and operative system shall be brought to the ENGINEER'S attention at least five days prior to the bid date in order for such devices to be noted or clarified in an addendum, otherwise furnished at his own expense.
- B. Cooperate with others in laying out work so that the electrical phase of the work will properly fit the construction and finishes. Space requirements, etc. other than that shown on the plans required to facilitate the electrical construction, shall be brought to the ENGINEER'S attention prior to commencing any work so that proper action may be taken to remedy this.
- C. Exact location of equipment shall be determined on the job. Do not scale electrical drawings for exact location of any equipment. All mounting heights shall be verified prior to rough-in.
- D. ENGINEER reserves the right to change the location of any equipment improperly installed and to change the exact location of any equipment connection location up to twenty feet prior to rough-in with no additional cost to the contract.
- E. Circuit grouping, conduit or cable runs are indicated diagrammatically with number of conductors shown in each raceway to clarify the operation and function of various systems. Provide the proper number of conductors and conduits or cables to produce an operative system as specified herein. Where conductors not shown, consult manufacturer's recommendations.

-
- F. Branch circuit shall be indicated as 2 or 3 wire circuits unless otherwise noted. No two ungrounded conductors will be connected to the same ungrounded main in any panel. There shall be no splicing of branch circuit conductors in any panel, safety switch or non-automatic circuit breaker in separate enclosures.
 - G. All materials shall be new (unless otherwise noted on the drawings or specified herein) and of approved equal or superior quality to those specified. All equipment or materials shall conform to the latest requirements of Underwriter's Laboratories, National Electrical Code, National, State or local agency having jurisdiction, American National Standards Institute (ANSI), National Electrical Safety Code and National Fire Protection (NFPA) Codes.
 - H. All conductors shall be color coded as specified herein. All conductors not complying with the specified color code shall be removed and replaced solely at the electrical subcontractor's expense.
 - I. All materials, devices, equipment, etc. shall be installed, tested and connected in strict compliance with manufacturer's recommendations.
 - J. Install all materials, equipment, devices, etc. in a neat and workmanlike manner. Use only experienced labor or employ appropriate subcontractor to do all cutting and patching necessary for the installation of his materials.
 - K. Protect from damage all apparatus and equipment furnished on this project. Equipment and materials shall be properly stored and adequately protected and carefully handled to prevent damage before and during installation. Equipment and materials shall be handled, stored and protected in accordance with the manufacturer's recommendations and as approved by the ENGINEER. Electrical conduit shall be stored to provide protection from the weather and accidental damage. Plastic conduit shall be stored on even supports and in locations not subject to direct sun rays or excessive heat. Cables shall be sealed, stored and handled carefully to avoid damage to the outer covering or insulation and damage from moisture and weather. Any piece of equipment or material marred or damaged shall be repaired, repainted and/or replaced to the complete satisfaction of the ENGINEER.
 - L. Any piece of equipment, switch, device, etc. shown mounted on and/or adjacent to any installed equipment which, if installed, may impair the proper operation of that equipment, shall be removed by the electrical contractor/subcontractor as required in order that installed equipment shall function properly. ENGINEER shall be notified immediately if any such condition exists.

1.07 Removal of Salvage Material and Debris

It shall be the responsibility of the CONTRACTOR to have all trash, salvage material, etc. related to the electrical work completely removed from the project site at all times during construction.

1.08 Trenching and Backfilling

- A. All trenching shall be done by mechanical means and all sides straight and vertical. Width of trenches shall not exceed eight inches on either side of placed equipment.

-
- B. All backfill shall be made with red sand (unless otherwise specified) and packed by mechanical means every six inches and left with a six-inch layer above finish grade to allow settling unless asphalt or concrete topping is to be provided.
 - C. Where required by safety or recommended standards and where any excavated trench or hole is more than five feet deep, install shoring on all sides to protect against sides caving in. Shoring method and material shall be the CONTRACTOR's responsibility.

1.09 Cutting, Patching, Finishing and Painting

- A. The CONTRACTOR shall be responsible for all cutting required to install his work. All existing walls shall be carefully trenched, cut, etc. to depths required to completely recess conduit and boxes. Where masonry walls are encountered, blocks and/or brick shall be carefully saw cut to exact box dimensions and conduit shall be routed in cavities, air spaces, etc.
- B. It shall be the responsibility of the CONTRACTOR to have all patching, finishing, painting, etc. done by qualified personnel related to his work.
- C. It shall be the responsibility of the CONTRACTOR to have all exposed conduit, piping and wireways painted where exposed in any space or location.

1.10 Corrosion Protection

It is the intent of these specifications to have all joints, connections, etc. exposed to climatic conditions to be completely watertight using the following:

- A. Nylon gland rings on all Liquid-tite conduit connectors.
- B. Nylon gland rings on all locknuts installed in boxes subject to moisture.
- C. Insulated throat connectors on all compression connectors.
- D. Corrosion inhibitors shall be placed in all environmental, control panels, exposed to damp or wet locations. Inhibitors shall be an approved equal to "Hoffman" A-HCI-1, A-HCI-5 and A-CI-40 and shall be sized in accordance with volume content of the device to be protected.
- E. Where equipment is exposed to severe conditions such as salts, acids, alkalies, sewer gases, etc., all equipment shall be sprayed inside and out with two coats of General Electrical Glyptal No. 1201-A or an approved equal.

1.11 Project Site Inspection

It shall be the responsibility of the CONTRACTOR to visit the proposed sites and make his own observation of the work to be done under the plans and specifications and same shall be contained in his bid proposal. Failure to do so will not relieve him of any responsibility and will not be justification for requesting additional money from the OWNER.

1.12 Coordination of Existing Utilities

It shall be the responsibility of the CONTRACTOR to coordinate all existing utilities location both overhead and underground and verify their locations with the various utilities prior to commencing any work. CONTRACTOR shall call Mississippi One Call 811 and obtain a utility location request number and refer to this number each time a utility company is notified of diggings or trenching near their utilities. Failure to do this shall not relieve him of any responsibility and will not be justification for requesting additional money from the OWNER due to damage of any of these utility lines.

1.13 Construction Tools, Utilities and Buildings

The CONTRACTOR shall furnish all tools, utilities, job office and storage buildings required for his use and to protect all electrical equipment as directed by the ENGINEER.

1.14 Payment Items

Progress payments shall be made to the CONTRACTOR based on the percentage of work performed on various payment items. The electrical payment items shall be included with the preliminary schedule of values and payment requests submitted by the CONTRACTOR.

1.15 Manufacturer's Recommendations

Where installation procedures are specified to be in accordance with the recommendations of the manufacturer of the material or equipment being installed, printed copies of these recommendations shall be furnished to the ENGINEER by the CONTRACTOR prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

1.16 Submittals

Specific items requiring submittals shall be as specified herein. Shop drawings shall be submitted and approved before procurement, fabrication or delivery of such items to the project site. Partial submittals are not acceptable; such submittals will be returned without review.

- A. Manufacturer's Data: Submittals for each manufactured item shall be manufacturer's descriptive literature, equipment drawings, diagrams, performance and characteristic curves and catalog cuts. Each submittal shall include the manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, specification reference, applicable federal, military and industry specification references and all other information necessary to establish contract compliance.
- B. Shop drawings shall show types, sizes, accessories, elevations, plans, sectional view, installation details, elementary diagrams and wiring diagrams. Wiring diagrams shall identify circuit terminals and shall indicate the internal wiring for each item of equipment and the interconnection between the items. Drawings shall also indicate adequate clearance for operation, maintenance and replacement of operating equipment devices. If any equipment is disapproved, the drawings shall be revised to show acceptable equipment and be resubmitted.

-
- C. Standards Compliance: When materials or equipment must conform to the standards of organizations such as the American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturer's Association (NEMA) and Underwriters' Laboratories (UL), proof of such conformance shall be submitted to the ENGINEER for approval. If any organization uses a label or listing to indicate compliance with a particular standard, the label or listing will be acceptable evidence, unless otherwise specified in the individual sections. In lieu of the label or listing, the CONTRACTOR shall submit a certificate from an independent testing organization, which is competent to perform acceptable tests and is approved by the ENGINEER. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's standard. For materials and equipment whose compliance with organizational standards or specifications is not regulated by an organization using its own listing or label as proof of compliance, a certificate of compliance from the manufacturer shall be submitted for approval. The certificate shall identify the manufacturer, the product and the referenced standard and shall simply state that the manufacturer certifies that the product conforms to all requirements of the project specification and of the referenced standards listed.

PART 2 - PRODUCTS

2.01 Materials and Equipment

All materials, equipment and devices shall, as a minimum standard, meet the requirements of UL where UL standards are established for those items and the requirements of NFPA 70. All items shall be new unless specified or indicated otherwise.

2.02 Nameplates

Fed. Spec. L-P-387. Provide laminated plastic nameplates for each panel, transformer, relay, contactor, starter, safety switch and device. Each nameplate inscription shall identify the equipment and serving panel, and when applicable, the location. Nameplates shall be melamine plastic, 0.125-inch thick, white with black center core. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the black core. Minimum size of nameplates shall be as follows:

- A. Style No. 1: 1.0 inch by 2.5 inches for panelboard and terminal cabinet enclosures.
- B. Style No. 2: 0.5 inch by 1.5 inches for safety switches, enclosed individually mounted circuit breakers, small junction/terminal boxes, etc.

2.03 Warning Signs

ANSI Z35.1. Provide warning signs for the electric panel boards. Provide signs with the legend "DANGER HIGH VOLTAGE KEEP OUT" printed in three lines of nominal 3-inch high letters.

PART 3 - EXECUTION

3.01 Nameplate Mounting

Provide number, location and letter designation of nameplates. Fasten nameplates to the device or enclosure with a minimum of two oval head stainless steel screws.

3.02 Painting of Equipment

- A. Factory Applied: Electrical equipment shall have factory-applied painting systems which shall, as a minimum, meet the requirements of NEMA ICS 6 corrosion-resistance test.
- B. Field Applied: Paint electrical equipment as required to match finish or to meet safety criteria. Painting shall be a minimum of three coats consisting of primer and two finish coats. Touch-up paint of all equipment shall be required where equipment has become damaged as a result of handling, rusting, etc. Paint shall be applied in even three coats, consisting of prime coat and two finish coats. See plans for special PVC applications.

END OF SECTION

SECTION 16020

CODES AND STANDARDS

PART 1 - GENERAL

1.01 Description

The following codes and standards shall be complied with as though fully written herein in these specifications and shall be applicable to CONTRACTOR, supplier, and manufacturer. Dates and amendments shall be the latest edition thereof in force at time of project bid date. Bidders shall be responsible for obtaining their own copies of these codes and standards and pay all cost thereof. Bidders may request addresses of codes and standards issuing agency from ENGINEER in writing in sufficient time to obtain required copies from issuing standards institute.

- A. National Fire Protection Association (NFPA)
 - NFPA 70 National Electrical Code (N.E.C.)
 - NFPA 78 Lightning Protection Code
 - NFPA 77 Recommended Practice on Static Electricity
- B. American National Standards Institute (ANSI)
 - ANSI B16.11 Forged Steel Fittings, Socket Welding and Threaded
 - ANSI C57.12.01 General Requirements for Dry-Type Distribution and Power Transformers
 - ANSI C57.12.91 Test Code for Dry-Type Distribution and Power Transformers
 - ANSI Z35.1 Accident Prevention Signs
 - C80.1 Specification for Rigid Steel Conduit, Zinc-Coated
- C. Occupational Safety and Health Act (OSHA) Requirements
- D. Underwriters Laboratories (UL)
 - UL 6 Rigid Metallic Conduit
 - UL 50 Cabinets and Boxes
 - UL 360 Liquid-Tite Flexible Steel Conduit
 - UL 467 Grounding and Bonding Equipment
 - UL 486A Wire Connectors and Soldering Lugs for Use with Copper Conductors
 - UL 468C Splicing Wire Connectors
 - UL 489 Molded Case Circuit Breakers
 - UL 508 Enclosures
 - UL 510 Insulating Tape
 - UL 514A Outlet Boxes and Fittings
 - UL 651 Schedule 40 and 80 Rigid PVC Conduit
 - UL 854 Service-Entrance Cables
 - UL 869 Service Equipment
 - UL 943 Ground-Fault Circuit Interrupters
 - UL 1059 Terminal Blocks
 - UL 1449 Transient Voltage Surge Suppressors
 - UL 1561 Dry-Type General Purpose and Power Transformers

-
- | | |
|---------|--|
| UL 1581 | Reference Standard for Electrical Wires, Cables and Flexible Cords |
|---------|--|
- E. National Electrical Manufacturer's Association (NEMA)
- | | |
|------|--|
| WC3 | Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy |
| TC3 | PVC Fittings for Use with Rigid PVC Conduit and Tubing |
| RN1 | PVC Externally Coated Rigid Galvanized Steel Conduit and Electrical Metallic Tubing |
| ICS1 | General Standards for Industrial Control and Systems |
| ICS2 | Standards for Industrial Control Devices, Controllers and Assemblies |
| ICS6 | Terminal Blocks for Industrial Control Equipment and Systems |
| TC2 | Electrical Plastic Tubing (EPT) and Conduit EPC-40 and EPC-80 |
| TR1 | Transformers, Regulators and Reactors |
| WD1 | General Purpose Wiring Devices |
| LA1 | Surge Arrestors |
- F. Institute of Electrical and Electronic Engineers (IEEE): Standard Dictionary of Electrical and Electronics Terms
- G. American Society for Testing and Materials (ASTM)
- | | |
|------|---|
| A53 | Pipe, Steel, Black and Hot-Dipped Zinc-Coated |
| A123 | Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products |
| A153 | Zinc Coating (Hot-Dip) on Iron and Steel Hardware |
| B8 | Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard or Soft |
| A525 | General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process |
| A780 | Repair of Damaged Hot-Dip Galvanized Coatings |

PART 2 - PRODUCT NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION

SECTION 16030

ELECTRICAL SYSTEMS SCHEDULE

PART 1 - GENERAL

1.01 Description

- A. CONTRACTOR to furnish all materials and labor and perform all operations, including, but not limited to, coordination with general construction shop and field drawings, manufacturer's recommendations and installation instructions, to produce a complete and operative system. It is specifically noted that the plans are diagrammatic and the specifications are descriptive and do not show every piece of equipment, conduit, wiring boxes, etc.; however, where any mention of a system or system operation is indicated in the contract documents, CONTRACTOR shall provide material and labor for that system to be fully operational to the satisfaction of the ENGINEER and OWNER.
- B. The following operative systems shall be applicable to this project.
1. Secondary underground 120/208 VAC three phase service and distribution system, complete with conduit, conductors, termination lugs, trenching and backfill, and testing.
 2. Site power system (600-volt and below) complete with final electrical connections to all panels, auxiliary equipment controls, distribution equipment, transformers, lights, etc.
 3. Lighting systems complete with fixtures, accessories, mounting hardware, lamps, poles, etc.
 4. Grounding protection system complete with wiring, connectors, ground rods, exothermic connections, compression connectors and certification from supplier.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION

INTENTIONALLY LEFT BLANK

SECTION 16040

BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 Description

- A. Equipment and materials specified by manufacturer's name and catalog number or an approved equal by the ENGINEER unless otherwise specifically stated herein.
- B. CONTRACTOR shall submit to the ENGINEER in triplicate, typewritten copies of all electrical materials and equipment proposed for use on the project within ten (10) days after award of contract. If this list is not received prior to fifteen (15) days after award of contract, CONTRACTOR is required to furnish specified items by manufacturer and catalog number.
- C. Verbal or written requests by sales agents, manufacturer's agents, CONTRACTOR'S or subcontractors for substitutions of specified equipment by manufacturer and catalog number prior to opening of bids will not be considered or approved. In no case will prior approval be given verbally or in writing of any equipment whether specified by manufacturer and catalog or not prior to opening of bids.
- D. CONTRACTOR shall not place any orders or release shipment of any piece of equipment or materials until all formal submittals have been approved by ENGINEER including any supplemental submittal requirements requested by the ENGINEER.
- E. Samples of any equipment or materials may be required at the ENGINEER's request. This shall apply to specified items and substituted items. Samples shall be made available to the ENGINEER at his designated location. Special equipment such as motor control centers, generators, automatic transfer switch, radio equipment, fire alarm or intrusion alarm systems would be required to be set up and inspections made available at the manufacturer's plant locations. All expenses for travel, per diem, etc. will be paid for by the CONTRACTOR. This expense may include an OWNER'S representative.
- F. The ENGINEER's opinion shall be final and binding on the approved equal status for equality of any substituted item from that listed by manufacturer and/or manufacturer catalog number.
- G. Submittals for approval by ENGINEER shall include shop drawings, manufacturer's brochures and data sheets, samples where required such as paint, waterproofing, marking tape, wiring and cable; test reports, testing procedures, finishes, etc. Refer to Section 01340.
- H. Submittals shall be required, but not limited to, the following:
 - 1. Transformers.
 - 2. Wire and cable
 - 3. Conduit and fittings
 - 4. Boxes, covers and plates
 - 5. Branch circuit compression connectors

-
6. Marking and identification devices
 7. Grounding system
 8. Paint
 9. Lighting fixtures
 10. Panelboards
 11. Metering Equipment
 12. Miscellaneous as shown on drawings
 13. Lamps
 14. Poles

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION

SECTION 16050
UTILITY SERVICE

PART 1 - GENERAL

1.01 Description

- A. Scope: Furnish all labor materials, equipment and incidentals required to provide electric utility service for the project from the serving utility. The services consist of one 4-wire services, 120/208-volt 3-Phase Services. In general, the following work shall be performed by the Contractor.
 - 1. Tennis court complex secondary wiring from pad mounted transformer to panel.
 - 2. Contractor shall install power service secondary structure with all components, all conduit and conductors to all lighting, building and miscellaneous components and make final connections.
- B. Coordination: Contractor shall make all arrangements with regard to the service connections required. It shall be the responsibility of the Contractor to fully coordinate with the serving utility requirements.
- C. Work performed by others: The following work will be performed by the serving utility: Supply of pad mounted transformer and primary lines.

1.02 Quality Assurance

Work in connection with electric utility shall be done in strict conformance with the requirements of the serving utility.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

INTENTIONALLY LEFT BLANK

SECTION 16111
CONDUIT AND FITTINGS

PART 1 - GENERAL

1.01 Description

- A. Metal conduit.
- B. Flexible metal conduit.
- C. Liquid-Tite flexible metal conduit.
- D. Non-metal conduit.
- E. PVC-coated metal conduit.
- F. Fittings and conduit bodies.

1.02 Related Sections

- A. Section 16130, Boxes.
- B. Section 16170, Grounding and Bonding.
- C. Section 16190, Supporting Devices.
- D. Section 16195, Electrical Identification.

1.03 References

- A. ANSI C80.1 – Rigid Steel Conduit, Zinc Coated
- B. ANSI/NEMA PB 1 – Fittings, Cast Metal Boxes and Conduit Bodies for Conduit and Cable Assemblies.
- C. ANSI/NFPA 70 – National Electrical Code.
- D. NECA "Standard of Installation".
- E. NEMA RN 1 – Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- F. NEMA TC 2 – Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80)
- G. NEMA TC 3 – PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.04 Design Requirements

Conduit Size: ANSI/NFPA 70 (unless noted otherwise on the drawings and contained herein.

1.05 Submittals

- A. Submit under provisions of Section 16010 and Section 01340, Shop Drawings, Project Data and Samples.
- B. Product Data: Provide for metallic conduit, Liquid-tite flexible metal conduit, non-metallic conduit, conduit bodies and fittings.

1.06 Project Record Documents

- A. Submit under provisions of Section 16010.
- B. Accurately record actual routing of all underground conduits and mark on record drawings.

1.07 Field Samples

- A. Provide under provisions of Section 16040.
- B. Provide field sample of PVC-coated steel conduit, one each at two feet long.
- C. Provide field sample of connectors and fittings.

1.08 Delivery, Storage and Handling

- A. Deliver, store, protect and handle products to site.
- B. Accept conduit on site. CONTRACTOR shall, prior to acceptance, inspect for damage.
- C. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- D. Protect PVC conduit from sunlight.

1.09 Project Conditions

- A. Verify all field measurements as required or shown on drawings.
- B. Verify routing and termination locations of conduit prior to rough-in.
- C. Conduit routing is shown on drawings in approximate locations unless dimensioned. Route as required parallel and perpendicular to structures.

PART 2 - PRODUCTS

2.01 Conduit Requirements

- A. All wiring shall be installed in conduit, including power and low voltage unless otherwise noted on drawings as Direct Burial.
- B. Minimum size conduit shall be as follows: 1 inch for power and branch circuit wiring, unless noted otherwise on the drawings.
- C. Conduit shall be installed in accordance with the following schedule:
 - 1. In all poured construction concrete, **thick** wall galvanized rigid steel conduit (GRC) or Schedule 80 PVC.
 - 2. In exposed locations outdoors: Galvanized thick wall rigid steel (GRC).
 - 3. Underground installations: Schedule 40 PVC.

2.02 Fittings

- A. Where conduits enter junction boxes, pullboxes, panels, cabinets, gutters, etc. use insulated throat connectors, Racor Cat. #1003 and 1004, Locknuts #1133 and 1134, insulated throat bushing and #1222, 1223, and 1224, insulated throat ground bushings for rigid conduit, Racor Cat. #2912, 2913, 2914, for EMT. Racor Cat. #3302, 3303, 3304 for flexible metal conduit. Racor Cat. 3512, 3513 and 3514 for Liquid-Tite connectors. Conduits entering junction boxes, pullboxes, panels, cabinets, gutters, etc. shall have insulated throat grounding bushings equal to Racor Cat. #1225, 1226, 1228, 1230, 1232, 1234 and 1236.
- B. Only threaded joint connectors and malleable iron no thread compression box connectors shall be used on rigid conduit. No fittings requiring set screws or indoor type applications, including BM connectors, will be allowed.

2.03 Conduit Straps and Hangers

Two-hole push-on stamped straps Racor Cat. #2232, 2233, 2234, 2235, 2236 and 2238 for rigid conduit. These anchors shall be used on surface areas such as concrete, masonry, wide flange beams, columns and wood. All screws shall be stainless steel.

2.04 Expansion and Seal off Fittings

Install seal-off fittings where required by code or shown on the drawings for the job. Fittings shall be Crouse-Hinds Type EYS for vertical runs, Type EZS for horizontal and vertical runs, or Type EYS elbow seals, or approved equal in Killark or Appleton. All seals shall be properly installed using a non-hardening sealing compound and shall be sealed as soon as cable is installed.

2.05 Rigid Metal Conduit

- A. Manufacturers:
 - 1. Allied
 - 2. Wheatland
 - 3. Republic

-
- 4. Approved equal
 - B. Rigid Galvanized Steel Conduit (GRC): ANSI C801. UL 6.

2.06 PVC-Coated Metal Conduit

- A. Manufacturers:
 - 1. Robroy
 - 2. Approved equal.
- B. Description: NEMA RN1; rigid steel conduit with external and internal PVC coating, 20 mil, 0.05 mm thick.
- C. Fittings and Conduit Bodies: ANSI/NEMA FB1; steel fittings with external and internal PVC coating to match conduit.

2.07 Liquid-tight Flexible Metal Conduit

- A. Manufacturers:
 - 1. Alflex
 - 2. Anamet
 - 3. AFC
 - 4. Approved equal
- B. Description: Interlocked aluminum construction with PVC jacket.
- C. Fittings: ANSI/NEMA FB1.

2.08 Non-metallic Conduit

- A. Manufacturers:
 - 1. Carlon
 - 2. Approved equal
- B. Description: NEMA TC2; Schedule 40 PVC.
- C. Fittings and Conduit Bodies: NEMA TC3.

PART 3 - EXECUTION

3.01 Installation

- A. Install conduit in accordance with NECA "Standard of Installation".
- B. Install non-metallic conduit in accordance with manufacturer's instructions.
- C. Arrange supports to prevent misalignment during wiring installation.

-
- D. Support conduit using coated steel straps with stainless steel screws.
 - E. Fasten conduit supports to structures and surfaces under provisions of this section.
 - F. Do not support conduit with wire or perforated pipe straps in any type structure. Remove wire used for temporary supports.
 - G. Route all conduit, whether exposed or concealed, parallel and perpendicular to structures, etc.
 - H. Route conduit in and under slab or above ceiling from point-to-point.
 - I. Maintain 12-inch (300 mm) clearance between conduit and surfaces with temperatures exceeding 104E F. (40E C.).
 - J. Bring conduit to shoulder of fittings, fasten securely.
 - K. Join non-metallic conduit using cement as recommended by manufacturer. Wipe non-metallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.
 - L. Use conduit hubs for sealing locknuts to fasten conduit to cast boxes. All conduit entering top or sides of all junction boxes, pullboxes, wiring gutters, etc., exposed to weather shall have myers hub connectors.
 - M. Install no more than equivalent of four 90-degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use factory elbows for bends in metal conduit larger than 2-inch (50 mm) size. All bends shall be long radius. All field bends on conduit shall be made in accordance with tables in Article 346, NFPA 70.
 - N. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
 - O. Provide suitable fittings to accommodate expansion and deflection where conduit crosses control and expansion joints.
 - P. Provide suitable nylon pull string or No. 14 AWG steel wire in each conduit except sleeves and nipples.
 - Q. Use suitable caps to protect installed conduit against entrance of dirt and moisture.
 - R. Ground and bond conduit under provision of Section 16170.
 - S. Identify conduit under provisions of Section 16195.
 - T. All conduit male threads shall be coated with "General Electric" RTV silicone sealer where conduit is installed outdoors, in contact with concrete or earth.
 - U. All feeders shall be run in galvanized or sheradized thick wall rigid steel (GRC), or IMC.

-
- V. All conduits shall be sized as noted on the drawings and contained therein. Where size is not shown, consult ENGINEER.
 - W. All upturned conduits shall be capped during construction rough-in to prevent moisture or debris from entering. Pull through each and every conduit a dry swab of sufficient size to remove any and all moisture. Seal all conduit terminations with GE Silicone or duct putty prior to final acceptance of the project.
 - X. Maximum length of flexible liquid-tite conduit shall not exceed 5 feet.
 - Y. Assure ground continuity on all branch circuitry conduits with two locknuts, one inside and one outside of all boxes, cabinets and gutters for rigid conduit.
 - Z. Conduit Curb:
 - 1. In concrete slabs or floors, provide a 2-inch high curb extending 2-inches from the outer surface of the conduit penetrating the floor, to prevent corrosion.
 - 2. Terminate conduit stub-ups in couplings, slightly above the finished concrete curb.
 - 3. Paint the stub-up with Scotch-Clad Protective Coating #1706 or equal, a minimum of 6-inches above and below the finished surface of the concrete.

3.02 Conduit Supports

Support conduits as follows:

- A. Galvanized rigid thick wall conduit (GRC), IMC and EMT, within three (3) feet of all outlet boxes, junction boxes, cabinets, gutters or fittings. Horizontally anchored at 10'-0" maximum intervals. Other spacings are noted on the plans.
- B. Liquid-tite flexible conduit (Sealtite), within 12 inches of all outlet boxes, junction boxes, cabinets, gutters or fittings and bends or turns. Horizontally anchored at 2-foot intervals. Minimum size permitted is 3/4-inch.

END OF SECTION

SECTION 16120
WIRE AND CABLE

PART 1 - GENERAL

1.01 Description

- A. Building wire.
- B. Cable including instrumentation, control, etc.
- C. Wiring connections and terminations.

1.02 References

- A. NEMA WC 3 – Rubber-insulated wire and cable for the transmission and distribution of electrical energy.
- B. NEMA WC 5 – Thermoplastic-insulated wire and cable for the transmission and distribution of electrical energy.

1.03 Submittals

- A. Submit manufacturer's product data under the provisions of Section 16010, Shop Drawings Submittal.
- B. Submit manufacturer's instructions.

PART 2 - PRODUCTS

2.01 Conductors

- A. Thermoplastic insulated building wire: NEMA WC5.
- B. Rubber insulated wire: NEMA WC3.
- C. Feeders and branch circuits: copper, stranded conductor, 600 volt insulation THHN-THWN in conduit.
- D. Service entrance cable: copper, stranded conductor, 600 volt insulation, THHN-THWN in conduit.

PART 3 - EXECUTION

3.01 General Wiring Methods

- A. Use no wire smaller than #12 AWG for power circuits and no smaller than #14 AWG for control wiring.
- B. Place an equal number of conductors for each phase of a circuit in same raceway or cable.
- C. Splice only in junction or outlet boxes.
- D. Neatly train and lace wiring inside boxes, equipment and panelboards.

3.02 Wiring Installation in Raceways

- A. Pull all conductors into a raceway at the same time. Use UL listed wire pulling lubricate for pulling #4 AWG and larger wires.
- B. Completely and thoroughly swab raceway system before installing conductors.

3.03 Cable Installation

Provide protection for exposed cables where subject to damage.

3.04 Wiring Connections and Terminations

- A. Splice only in accessible junction boxes.
- B. Thoroughly clean wires before installing lugs and connectors.
- C. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.
- D. Terminate spare conductors with electrical tape and wire nut.
- E. Splices in all junction boxes shall be made by the compression method. Crimp connectors shall be "Buchanan" Cat. #2006S, #2008S or #2011S with #2007, #2014 or #3007B caps or approved equal.

3.05 Field Quality Control

- A. Field inspection and testing will be performed under provisions of Section 16010.
- B. Inspect wire and cable for physical damage and proper connection.
- C. Torque test conductor connections and terminations to manufacturer's recommended values.
- D. Perform continuity test on all power and equipment branch circuit conductors. Verify proper phasing connections.

3.06 Wire and Cable Installation Schedule

- A. Exterior Locations: Conductors in raceways.
- B. Underground Locations: Conductors in raceways.
- C. Color Coding (Power System): The following conductor color coding shall be used:

480Y/277-Volt System

Phase A – Brown
Phase B – Orange
Phase C – Yellow
Neutral – Gray
Equipment Ground – Green

240/120-V, 3-Wire, Single-Phase System

One Hot Leg – Black
One Hot Leg – Red
Neutral – White
Equipment Ground Green

208Y/120-Volt System

Phase A – Black
Phase A – Switch Leg – Gray
Phase B – Red
Phase B – Switch Leg – Pink
Phase C – Blue
Phase C – Switch Leg – Purple
Travelers – Yellow
Neutral – White
Equipment Ground – Green

END OF SECTION

INTENTIONALLY LEFT BLANK

SECTION 16130

BOXES

PART 1 - GENERAL

1.01 Description

- A. Wall and ceiling outlet boxes.
- B. Pull and junction boxes.

1.02 Related Sections

- A. Section 16111, Conduit and Fittings.
- B. Section 16141, Wiring Devices.
- C. Section 16160, Cabinets and Enclosures.
- D. Section 16180, Equipment Wiring Systems.

1.03 References

- A. ANSI/NEMA FB 1 – Fittings and Supports for Conduit and Cable Assemblies.
- B. ANSI/NEMA OS 1 – Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- C. ANSI/NEMA OS 2 – Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.
- D. ANSI/NFPA 70 – National Electrical Code.
- E. NEMA 250 – Enclosures for Electrical Equipment (1000 Volts Maximum).

1.04 Project Record Documents

- A. Submit under provisions of Section 01720.
- B. Accurately record actual locations and mounting heights of outlet, pull, and junction boxes.

1.05 Regulatory Requirements

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.06 Project Conditions

- A. Verify field measurements as shown on Drawings.
- B. Verify locations of boxes and outlets in plant laboratory, offices and work areas prior to rough-in.
- C. Electrical boxes are shown on Drawings in approximate locations unless dimensioned. Install at location required for box to serve intended purpose. Include installation within 20 feet of location shown.

PART 2 - PRODUCTS

2.01 Outlet Boxes

- A. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1, galvanized steel.
 - 1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 1/2-inch or 3/4-inch male fixture studs where required.
 - 2. Only 4-inch square boxes with raised gang covers will be allowed.
- B. Cast Boxes: NEMA FB 1, Type FD, aluminum. Provide gasketed cover by box manufacturer. Provide threaded hubs as required.

2.02 Pull and Junction Boxes

- A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.
- B. Surface-Mounted Cast Metal Box: NEMA 250, Type 3R; flat-flanged, surface-mounted junction box.
 - 1. Material: Cast aluminum.
 - 2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.
- C. In-Ground or Concrete Cast Metal Box: NEMA 250, Type 6, inside flanged, recessed cover box for flush mounting.
 - 1. Material: Galvanized cast iron.
 - 2. Cover: Nonskid cover with neoprene gasket and stainless steel cover screws.
 - 3. Cover Legend: ELECTRIC, COMM.

PART 3 - EXECUTION

3.01 Installation

- A. Install electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
- B. Install electrical boxes to maintain headroom and to present neat mechanical appearance.

-
- C. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
 - D. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches (150 mm) from ceiling access panel or from removable recessed luminaire.
 - E. Install boxes to preserve fire resistance rating of partitions and other elements.
 - F. Align adjacent wall-mounted outlet boxes for switches, thermostats, and similar devices with each other.
 - G. Use flush mounting outlet boxes in finished areas with raised gang covers.
 - H. Do not install flush mounting boxes back-to-back in walls; provide minimum 6 inch (150 mm) separation. Provide minimum 24 inches (600 mm) separation in acoustic rated walls.
 - I. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
 - J. Use stamped steel bridges to fasten flush mounting outlet box between studs. Span between studs.
 - K. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
 - L. Use adjustable steel channel fasteners for hung ceiling outlet box.
 - M. Do not fasten boxes to ceiling support wires.
 - N. Support boxes independently of conduit, except cast box that is connected to two rigid metal conduits both supported within 12 inches of box.
 - O. Use gang box where more than one device is mounted together. Do not use sectional box.
 - P. Use gang box with plaster ring for single device outlets.
 - Q. Use cast outlet box in exterior locations exposed to the weather and wet locations.
 - R. Large Pull Boxes: Boxes larger than 100 cubic inches (1600 cubic centimeters) in volume or 12 inches (300 mm) in any dimension.
 - 1. Interior Dry Locations: Use hinged enclosure under provisions of Section 16160.
 - 2. Other Locations: Use surface-mounted cast metal box.

3.02 Interface with Other Products

- A. Coordinate installation of outlet box for mechanical equipment furnished under Division 15.
- B. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening. Use raised gang square covers.

-
- C. Coordinate mounting heights and locations of outlets mounted above counters, benches and backsplashes.
 - D. Position outlet boxes to locate luminaires as shown on drawings.

3.03 Adjusting

- A. Adjust flush-mounting outlets to make front flush with finished wall material. Maximum tolerance is 1/8-inch recess in finished wall.
- B. Install knockout closure in unused box opening.

END OF SECTION

SECTION 16140
WIRING DEVICES

PART 1 - GENERAL

1.01 Description

Furnish and install wiring devices as shown or noted on plans, including all required mounting hardware, etc.

PART 2 - PRODUCTS

2.01 Safety Switches

- A. Type: Horsepower rated, heavy-duty, single throw, three pole with visible blade and safety handle. Fused and/or unfused as specified elsewhere and/or designated on the Drawings and/or as required by NEC. Sized as required by NEC and/or as shown on the Drawings.
- B. Each switch shall have indented plastic phenolic sign (minimum 1/8-inch lettering) identifying load served with voltage and horsepower attached to switch with stainless steel screws.
- C. Enclosure: Painted Steel NEMA 3R for outdoor locations.
- D. Manufacturers:
 - 1. Square D Co.
 - 2. General Electric Co.
 - 3. Westinghouse.
 - 4. Or equal.

2.02 Receptacle

- A. Indoor Locations:
 - 1. Duplex grounding receptacle, two pole, three wire, 125 volt AC, 20 ampere, stainless steel cover plates. Products and Manufacturers:
 - a. Cat. #5362-CR, by Arrow-Hart Inc.
 - b. Cat. #53CM62, by Harvey Hubbell Inc.
 - c. Or equal.
 - 2. Single grounding receptacle, corrosion resistant, two pole, three wire, 125 volt AC, 20 ampere, stainless steel cover plates. Products and Manufacturers:
 - a. Cat. #5361-CR, by Arrow-Hart Inc.
 - b. Cat. #53CM61, by Harvey Hubbell Inc.
 - c. Or equal.
- B. Ground Fault Receptacle Where Designated on the Drawings:
 - 1. Type: UL listed, 20 ampere, 125 volt AC, sensitivity of 5 mA, three wires, and weather-proof cover plates.

-
- 2. Manufacturer:
 - a. Hubbell, No. 6F-5362-GY with a 5221 cover plate.
 - b. Or equal.
 - C. Weatherproof Receptacle where Designated on the Drawings: Type UL listed duplex grounding receptacle, corrosion resistant, two pole, three wire, 20 ampere, 125 volt AC, weather-proof cover plates.

2.03 Switches

- A. Indoor Non-Hazardous Locations:
 - 1. Single pole AC toggle switch, quiet type, 120/277 volt AC, 20 ampere, Brown, specification grade with stainless steel cover, screws and grounding terminal. Products and Manufacturers:
 - a. Cat. #20AC1 by Pass & Seymour, Inc
 - b. Cat. #CS 120 by Hubbell.
 - c. Or equal.
 - 2. Toggle switches of the three-way type shall be quiet type, 120/277 volt AC, 20 ampere, specification grade with stainless steel cover, screws and grounding terminal. Products and Manufacturers:
 - a. Cat. #20AC3 by Pass & Seymour, Inc.
 - b. #CS 320 by Hubbell.
 - c. Or equal.
 - 3. Toggle switches of the four-way type shall be of the same grade and manufacture as the single pole and three-way type.
 - 4. Toggle switches of the two-pole, single throw type shall be of the same grade and manufacturer as above.
- B. Horsepower-Rated Switches:
 - 1. Type: Toggle operated, horsepower rated with thermal overload protection.
 - 2. Enclosure: NEMA 1 for dry, indoor locations and NEMA 4 for outdoor and damp or wet indoor locations.
 - 3. Products and Manufacturers: Provide one of the following:
 - a. Type 609T by Allen-Bradley.
 - b. Class 2510 by Square D Co.
 - c. Or equal.

2.04 Fuses

- A. Type: Dual-element, current-limiting, UL Class RK5, 600 volts, unless otherwise noted or specified.
- B. Interrupting Capacities (UL Listed): 200,000 RMS amperes.
- C. Coordination:
 - 1. Coordinated for installation in existing and new equipment.
 - 2. Properly coordinated for size, type and rating as required for equipment and circuits to be protected.

-
- D. Repair Parts: One replacement fuse for each and every fuse installed under this Contract.
 - E. Manufacturers: Provide products from one of the following:
 - 1. Bussman Division, McGraw Edison Company.
 - 2. Gould Inc., Circuit Protection Division.
 - 3. Or equal.

2.05 Surge Protection Device

Surge protection device shall be Surge Suppression SDLB3 Series rated for 180KA or approved equal.

PART 3 - EXECUTION

3.01 Mounting

- A. Safety switches shall be mounted on structural frame with minimum of four points of attachment using stainless or galvanized steel hardware.
- B. Install one spare set of fuses inside fused switch enclosure attached to side.
- C. In non-hazardous locations, install wiring devices in outlet or device boxes.
- D. Mount wall switches four feet, zero inches above finished floor unless otherwise noted.

END OF SECTION

INTENTIONALLY LEFT BLANK

SECTION 16160
CABINETS AND ENCLOSURES

PART 1 - GENERAL

1.01 Description

- A. Hinged cover enclosures
- B. Cabinets
- C. Mounting panel
- D. Terminal blocks and accessories

1.02 References

- A. NEMA 250 – Enclosures for electrical equipment (1,000 volts maximum).
- B. ANSI/NEMA ICS 1 – Industrial control and systems.
- C. ANSI/NEMA ICS 4 – Terminal blocks for industrial control equipment and systems.
- D. ANSI/NEMA ICS 6 – Enclosures for industrial control equipment and systems.
- E. UL 50 – Enclosures.

1.03 Submittals

- A. Submit shop drawings and product data under provisions of Sections 16010 and 01340, Shop Drawings Submittal.
- B. Shop Drawings for Equipment and Enclosure Panels: Include wiring schematic diagram, wiring diagram, outline drawings and construction diagram as described in ANSI/NEMA ICS 1.

PART 2 - PRODUCTS

2.01 Hinged Cover Enclosures

- A. Construction: NEMA 250; Type 3, steel, for indoor, NEMA 3R for outdoor installation.
- B. Finish: Dark gray, rust inhibitor.
- C. Covers: Continuous hinge, held closed by hasp and staple for padlock.

2.02 Cabinets

- A. Construction:
 - 1. 14-gauge G-90 grade galvanized steel
 - 2. Drip shield top and seam-free sides, front and back
 - 3. 16-gauge galvanized steel continuous hinge with stainless steel pin
 - 4. Cover fasteners with captive plated steel screws
 - 5. Hasp and staple for padlocking
 - 6. Knockouts in bottom
 - 7. Collar studs with back mounting panel
 - 8. Dark gray epoxy finish.
 - 9. Corrosion inhibitors
 - 10. Electric heater with thermostat where located outdoors
 - 11. Size: Verify size required with equipment to be housed or as noted on drawings.
- B. Manufacturer and Catalog No.: Hoffman Cat. No. scheduled with back panel or approved equal.

2.03 Terminal Blocks and Accessories

- A. Terminal Blocks: ANSI/NEMA ICS 4; UL listed.
- B. Power Terminals: Unit construction type, closed-back type, with tubular pressure screw connectors, rated 600 volts.
- C. Signal and control Terminals: Modular construction type, channel mounted; tubular pressure screw connectors, rated 300 volts.

PART 3 - EXECUTION

3.01 Installation

- A. Install cabinets and enclosures plumb; anchor securely to structural supports at each corner with galvanized bolts, nuts and Belleville washers.
- B. Install trim plumb.

END OF SECTION

SECTION 16170

GROUNDING AND BONDING SYSTEMS

PART 1 - GENERAL

1.01 Description

- A. Power system grounding.
- B. Electrical equipment and raceway grounding and bonding.
- C. Building ground grids.

1.02 System Description

- A. Ground the electrical service system neutral at service entrance equipment to grounding electrode.
- B. Bond together system neutrals, service equipment enclosures, exposed non-current carrying metal parts of electrical equipment, metal raceway systems, grounding conductor in raceways and cables, receptacle ground and connectors.

1.03 Submittals

- A. Submit maintenance and grid layout data and shop drawings under provisions of Sections 16010 and 01340.
- B. Indicate location of system grounding electrode connections and routing of grounding electrode conductor.

PART 2 - PRODUCTS

2.01 Materials

- A. Ground Rods: Copper-encased steel, 5/8-inch diameter, minimum length 10 feet.
- B. Ground Electrode Conductor: Size as noted on drawings with THHN-THWN insulation.
- C. Exothermic welds shall be as scheduled on the drawings.

PART 3 - EXECUTION

3.01 Installation

- A. Provide a separate, insulated equipment grounding conductor in branch circuits. Terminate each end on a grounding lug, bus or bushing.

-
- B. Connect grounding electrode conductors to ground electrode by exothermic weld using cable to rod connection.
 - C. Grounding Electrode: Use driven ground rod as shown on plans.
 - D. Use minimum #6 AWG copper conductor for communications service grounding conductor. Leave six feet (3 m) slack conductor at terminal cabinet or backboard.
 - E. Provide grounding and bonding at utility company's metering equipment.
 - F. Refer to drawings for schedule of exothermic connections.

3.02 Field Quality Control

- A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.
- B. Measure ground resistance from system neutral connection at service entrance to convenient ground reference point using suitable ground testing equipment. Resistance shall not exceed 5 ohms. Where resistance exceeds 5 ohms, additional ground rods shall be driven. Top of all rods shall be minimum of 2'-0" below finish grade elevation.

END OF SECTION

SECTION 16180
EQUIPMENT WIRING SYSTEMS

PART 1 - GENERAL

1.01 Description

Make all final electrical connections to all equipment shown on drawings or required for a complete and operable system.

All final electrical connections shall be made in strict compliance with NPFA-70 National Electrical Code, latest edition.

1.02 Related Sections

- A. Section 16010, General Provisions.
- B. Section 16020, Codes and Standards.
- C. Section 16111, Conduit and Fittings.
- D. Section 16120, Wire and Cable.
- E. Section 16130, Boxes.
- F. Section 16170, Grounding and Bonding Systems.

1.03 Project Record Documents

Submit documents in accordance with provisions of Section 01720.

PART 2 - PRODUCTS

Products are listed under related sections of the specifications.

PART 3 - EXECUTION

3.01 Instructions

- A. Shall be installed in conduit where and as shown on the drawings and in accordance with drawings and specifications.
- B. Power connections shall be as follows:
 - 1. Run all conduits and wiring for all control systems specified on this project.
 - 2. Run circuits from Panel boards to all equipment and make final electrical connections.

END OF SECTION

INTENTIONALLY LEFT BLANK

SECTION 16190
SUPPORTING DEVICES

PART 1 - GENERAL

1.01 Description

- A. Conduit and equipment supports.
- B. Fastening hardware.

1.02 Related Work

Refer to Sections 03200, 03250, 03300 and 03600.

1.03 Coordination

Coordinate size, shape and location of concrete pads with details on drawings and manufacturer's recommendations.

1.04 Quality Assurance

Support systems shall be adequate for weight of equipment and conduit, including wiring, which they carry.

PART 2 - PRODUCTS

2.01 Material

- A. Support Channel: Galvanized.
- B. Hardware: Corrosion-resistant.

PART 3 - EXECUTION

3.01 Installation

- A. Fasten hanger rods, conduit clamps and outlet and junction boxes to structure using stainless steel screws and galvanized bolts, nuts and Bellville washers. Do not use spring steel clips and clamps.
- B. Do not fasten supports to conduit.
- C. Fabricate supports from steel angle and steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with Bellville washers under all nuts.

END OF SECTION

SECTION 16195
ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.01 Description

- A. Nameplates.
- B. Wire and cable markers.

1.02 Related Work

Section 16010, General Requirements.

1.03 Submittals

- A. Submit shop drawings under provisions of Sections 16010 and 01340.
- B. Include schedule for nameplates.

PART 2 - PRODUCTS

2.01 Materials

- A. Nameplates: Engraved three-layer laminated plastic, white letters on a black background.
- B. Wire and Cable Markers: Cloth markers, split sleeve or tubing type.

PART 3 - EXECUTION

3.01 Installation

- A. Degrease and clean surfaces to receive nameplates.
- B. Install nameplates parallel to equipment lines.
- C. Secure nameplates to equipment fronts and panels using stainless steel screws.

3.02 Wire Identification

Provide wire markers on each conductor in enclosures and at load connection. Identify with branch circuit number for power circuits and with control wire number as indicated on equipment manufacturer's shop drawings for control wiring.

3.03 Nameplate Engraving Schedule

Provide nameplates to identify all electrical distribution and control equipment and loads served. Letter Height: 1/8 inch (3 mm) for individual switches and loads served and 1/4 inch (6 mm) for control equipment panel identification unless noted otherwise.

END OF SECTION

SECTION 16402

UNDERGROUND ELECTRICAL SERVICE

PART 1 - GENERAL

1.01 Description

Underground secondary service.

1.02 Related Sections

- A. Section 16010, General Requirements.
- B. Section 16111, Conduit and Fittings.

1.03 System Description

This section defines the method and manner by which the underground service shall be installed.

1.04 Project Record Documents

- A. Submit documents under provisions of Section 16020.
- B. Accurately record all underground electrical service routing, showing dimensions from curbs, buildings, etc.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 Trenching and Backfilling

Refer to Section 16010.

3.02 Laying Conduit

- A. Make bends with sweeps of not less than 48-inch radius or 5° angle couplings.
- B. Make a transition from non-metallic duct to rigid steel conduit ten feet from where duct banks enter structures, other than manholes or turn upward for continuation above grade.
- C. Install a warning ribbon approximately 18-inches below finished grade over all underground conduit carrying cables of 120 volts and higher. The identifying ribbon shall be a polyvinyl chloride tape, 3-inches wide, yellow color, permanently imprinted with "CAUTION BURIED ELECTRIC LINE BELOW" in black letters.

END OF SECTION

SECTION 16470

LIGHTING AND POWER PANELBOARDS

PART 1 - GENERAL

1.01 Description

Lighting and power panelboards.

1.02 Related Sections

- A. Section 16010, General Provisions.
- B. Section 16170, Grounding and Bonding Systems.
- C. Section 16195, Electrical Identification.

1.03 Submittals

- A. Submit under provisions of Section 01340.
- B. Submit manufacturer's data indicating bussing, enclosure, circuit numbering, sizes, etc.

PART 2 - PRODUCTS

2.01 Panelboards

- A. Shall be dead-front construction with solderless pressure terminals.
- B. Main and neutral busses shall be of capacity scheduled on drawings. Bussing shall be tin-plated, copper-based on maximum current density in accordance with UL Standard 891.
- C. Complete typewritten directory with transparent plastic cover inside of door. All panels shall be identified as they are designated on the drawings by 3/4-inch plastic phenolic sign with 1/4-inch indented letters on front face of panel attached with minimum of two (2) screws.
- D. Trim and door with lock and catch with two (2) keys. Keys shall be common to all panelboards.
- E. Circuit Breakers:
 - 1. Circuit breakers shall be quickmake and quickbreak on manual or automatic operation, with minimum interrupting capacity of 10,000 amps RMS symmetrical.
 - 2. Breakers shall be trip-free. Each breaker shall have trip indication independent of the ON or OFF positions.
 - 3. All breakers shall be UL listed and meet NEMA Standards Publication No. AB1 and

Federal Specification No. WOCO375a and any amendments to the above where applicable.

4. All breakers shall be calibrated for operation in an ambient temperature of 40E C.
5. All two- and three-pole breakers shall be common trip.
6. Automatic operation of the circuit breaker shall be obtained by means of thermal and/or magnetic tripping devices located in each pole. Thermal devices shall provide the time-delay tripping on overloads and the magnetic device shall provide instantaneous tripping on short circuits.
7. All breakers shall be bolt-on type.

PART 3 - EXECUTION

3.01 Installation

- A. Panels shall be securely mounted with through bolts, anchors or other approved means.
- B. Mount all panelboards with top breaker handle not more than 6'-6" above finish floor.
- C. Connect the phase wires of three (and/or four) wire home runs to breakers connected to separate phase busses of the panelboard. Panelboard circuits shall be numbers in sequence vertically and all circuits shall appear in the panel exactly as they are shown on the drawings.
All branch circuit neutral connections shall be identified by adhesive number tags to identify with their branch circuit phase conductors where neutral connections connect to the panel neutral bus.
- D. Neutrals and equipment ground conductors shall not be connected together in any panel beyond service entrance main.
- E. No two ungrounded conductors shall be connected to the same circuit breaker terminal.
- F. There shall be no splicing of conductors in panelboards.
- G. Panelboards shall be as scheduled on the drawings and as manufactured by Square D Company, Type NQOD, or approved equal.

END OF SECTION

SECTION 16501

LAMPS

PART 1 - GENERAL

1.01 Description

Lighting fixture lamps.

1.02 Related Sections

- A. Section 16010, General Requirements.
- B. Section 16510, Exterior Lighting System.

1.03 Submittals

- A. Submit under provisions of Section 01340.
- B. Submit manufacturer's data sheets showing manufacturer, wattage, type, lumens and general characteristics of each type lamp.

PART 2 - PRODUCTS

2.01 Drivers For LED Fixtures

- A. Electronic Driver for LED Fixtures: Comply with UL 1310 Class 2 requirements for dry and damp locations. Include the following features unless otherwise indicated:
 - 1. Rated for 50,000 hours of life, unless otherwise noted.
 - 2. Sound Rating: Class A.
 - 3. Total Harmonic Distortion Rating: 15 percent or less.
 - 4. Current Crest Factor: 1.5 or less.

2.02 LED Fixtures

- A. Except as otherwise indicated, provide LED luminaires, of types and sizes indicated on fixture schedules.
- B. Include the following features unless otherwise indicated:
 - 1. Each Luminaire shall consist of an assembly that utilizes LEDs as the light source. In addition, a complete luminaire shall consist of a housing, LED array, and electronic driver (power supply).
 - 2. Each luminaire shall be rated for a minimum operational life of 50,000 hours utilizing a minimum ambient temperature of (25°C).
 - 3. Light Emitting Diodes tested under LM-80 Standards for a minimum of 12,000 hours.
 - 4. Color Rendering Index (CRI) of 82 at a minimum.
 - 5. Color temperature 3500 K, unless otherwise indicated.

-
6. Fixture efficacy of 60 Lumens/Watt, minimum.
 7. 25 year luminaire warranty, minimum.
 8. Photometry must comply with IESNA LM-79.
 9. The individual LEDs shall be constructed such that a catastrophic loss of the failure of one LED will not result in the loss of the entire luminaire.
- C. Technical Requirements
1. Luminaire shall have a minimum efficacy of 60 lumens per watt. The luminaire shall not consume power in the off state.
 2. Operation Voltage: The luminaire shall operate from a 50 HZ to 60 HZ AC line over a voltage of 480 VAC. The fluctuations of line voltage shall have no visible effect on the luminous output.
 3. Power Factor: The luminaire shall have a power factor of 0.9 or greater.
 4. THD: Total harmonic distortion (current and voltage) induced into an AC power line by a luminaire shall not exceed 15 percent.
 5. Operational Performance: The LED circuitry shall prevent visible flicker to the unaided eye over the voltage range specified above.
- D. Thermal Management
1. The thermal management (of the heat generated by the LEDs) shall be of sufficient capacity to assure proper operation of the luminaire over the expected useful life.
 2. The LED manufacturer's maximum thermal pad temperature for the expected life shall not be exceeded.
 3. Thermal management shall be passive by design. The use of fans or other mechanical devices shall not be allowed.
 4. The luminaire shall have a minimum heat sink surface such that LED manufacturer's maximum junction temperature is not exceeded at maximum rated ambient temperature.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Lighting fixtures: Set level, plumb, and square with ceilings and walls. Install lamps in each fixture.
- B. Comply with NFPA 70 for minimum fixture supports.
- C. Suspended Lighting Fixture Support:
1. Pendants and Rods: Where longer than 48 inches (1200 mm), brace to limit swinging.
 2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.
 3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.

END OF SECTION

SECTION 16503

LIGHTING POLES AND STANDARDS

PART 1 - GENERAL

1.01 Description

Lighting poles and standards for parking and drive lighting.

1.02 Related Sections

- A. Section 16170, Grounding and Bonding Systems.
- B. Section 16501, Lamps.

1.03 Submittals

- A. Submit under provisions of Section 01340.
- B. Submit shop drawings showing dimensional data, wind load, size, painting process, anchor bolts, etc.

PART 2 - PRODUCTS

2.01 Poles

- A. Poles shall be as indicated on drawings.
- B. Wind Loading: Poles and fixtures shall withstand basic wind speed up to 110 mph.
- C. The Contractor shall be responsible for providing engineered foundation embedment design by a registered engineer in the state of Mississippi meeting the following parameters:
 - 1. Wind Loads: Wind loads shall be based on the 2009 International Building Code. Wind loads to be calculated using ASCE 7-05, a design wind speed of 120 mph, exposure category C, and wind importance factor of 1.0.
 - 2. Pole Structural Design: The stress analysis and safety factor of the poles shall conform to 2009 AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (LTS-5).
 - 3. Foundation Design: The foundation design shall be based on soil parameters as outlined in the geotechnical report. If no geotechnical report is provided, foundation designs shall be based on soils that meet or exceed those of a Class 5 material as defined by 2009 IBC Table 1806.2.
 - 4. Foundation Drawings: The foundation drawings must list the moment, shear (horizontal) force, and axial (vertical) force at ground level for each pole.

2.02 Luminaire

- A. Listing: Fixture shall be listed and labeled by Underwriters Laboratories, Inc.
- B. Lens Frame Assembly: Lens frame assembly shall consist of a 3/16-inch thick impact resistant clear tempered glass lens enclosed by a one-piece molded high temperature gasket. Lens and gasket shall interlock in an extruded aluminum frame which shall hinge at the pole end and shall close and tightly seal the optical chamber by four gasketed vibration-proof quarter-turn fasteners. Lens frame shall be removable without tools by means of quick-disconnecting hinges.
- C. Electrical Components: Electrical components shall be UL approved and be an integral part of the fixture. Ballasts and related components shall be integrated onto a single-mounting plate as a self-contained subassembly. Ballast assembly shall attach to fixture with quick-disconnect no-tool hinges and latches. Fast field wiring shall be provided for by prewiring all electrical components with quick-disconnect plugs. All ballasts shall be the component type capable of providing lamp starting down to -20 degrees F. with power factor of 90% or better (high power factor).
- D. Finish: Fixture and arm shall be factory finish in semi-gloss dark bronze baked enamel applied over a satin polish.

PART 3 - EXECUTION

3.01 Installation

Poles shall be set straight and plumb using a level.

END OF SECTION

SECTION 16520

COURT LIGHTING SYSTEM

PART 1 - GENERAL

1.01 Description

A. Instructions

1. The courts shall be lighted with 464-watt LED fixtures at 20 feet above grade on steel poles.
2. Lighting levels shall be as given below and are average maintained values assuming yearly cleaning of fixtures and a LLF of 0.95.
Courts – 50 FC Class III per Recommended Illumination for Tennis Facilities
Levels shall have average to minimum ratios not to exceed 1.4 for the courts.
3. The quantities indicated on the drawings shall be minimum required. If successful manufacturer determines additional fixtures are required to meet criteria, the fixtures will be furnished including all mounting and electrical service necessary.
4. Manufacturer shall supply with shop drawings a complete court layout with aiming diagram and FC plot.
5. Fixtures shall be NLS or equal.
6. Manufacturer will supply all drivers and supporting electrical equipment.
7. Painted steel poles to be round tapered, designed to withstand 120-mph basic wind speed (3-second gust). Pole height to be as required to establish minimum fixture mounting height. Manufacturer to be approved by Engineer. Poles to have manufacturer-furnished wiring hubs and mounting screw holes for equipment shown on the drawings. The poles shall comply with ASTM C 1089 and AASHTO LTS-5, 2009.
8. After final installation, a footcandle plot shall be made by Contractor using approved meter. This plot to be given to Engineer. After Engineer determines all is ready, a final check shall be made by Engineer to verify all values.
9. Final aiming may be required to be done with Engineer present and may occur at night. Contractor shall include these costs in his bid.
10. All components of the poles, including cross arms and fixtures, shall be rated for 120-mph basic wind speed (3-second gust).
11. The lighting control panel shall contain the following items for operation of the field lighting:
 - a. Instant On/Off Capabilities: System shall provide for instant on/off of luminaires by toggle switch.
 - b. Lighting contactor cabinet(s) constructed of MEMA Type 4 aluminum, designed for easy installation with contactors, labeled to match field diagrams and electrical design. Manual off-on-auto selector switches shall be provided.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 03315-2

POST TENSION CONCRETE TENNIS COURT

1.0 Purpose

The preferred method of concrete court construction is the post-tensioned concrete slab. This system allows for a much larger single monolithic pour, eliminates the need for expansion joints and minimizes reflective and surface cracking.

2.0 Slope and Elevation Requirements

All excavating, filling and grading requirements and compacting work of the subbase should be performed so that the finished subgrade is 4"-6" above the surrounding ground and slopes not less than 0.83% (1:120) and not more than 0.1% (1:100). Each court must slope in a true plane, preferably from side to side (but from end to end or from corner to corner also are acceptable), or in the shortest direction for good drainage and water runoff. The court should never be sloped from the net line to the baseline, from the baseline to the netline, from the sides to the centerline or from the centerline to the sides.

3.0 Base Preparation

Refer to Construction Plans.

4.0 Concrete Construction

A. Apron

The overall dimension of an individual court should be 61' x 121' to provide a 6" apron around the court or 62' x 122' to provide a 1' apron around the court. This additional footage helps prevent vegetation intrusion, facilitates landscape maintenance and adds to the overall cosmetics. Fencing should remain at 60' x 120'. Fence posts, net posts, sleeves and center anchor should be installed prior to or during concrete placement. Fencing should be completed prior to surfacing.

B. Moisture/Vapor Barrier

As with all concrete construction, a moisture/vapor barrier, consisting of polyethylene (10 mil. minimum thickness) should be installed prior to installation of any steel and/or cables. Overlap polyethylene sheets at least 6" and tape joints. Once in place no vehicular traffic should be allowed on the moisture/vapor barrier nor any other object which could puncture the barrier or otherwise compromise the integrity of the surface. All concrete should be pumped, not driven onto the court. Excessive loads at any time are unacceptable.

C. Cement

Cement (Type 1 or 1A) should conform to one of the Standard Specifications for Portland Cement, ASTM C 150 or Specifications for Blending Hydraulic Cements, ASTM C 595, excluding slag cements Types S and SA. Do not use curing compounds.

D. Air Entrainment

Air entrainment by total volume of concrete should be:

4 to 6% for 1 1/2" maximum size coarse aggregate, 5 to 7% for 3/4" or 1" maximum size coarse aggregate, 6 1/2 to 8 1/2% for 3/8" or 1/2" maximum size coarse aggregate.

E. Aggregate

Aggregate should conform to Standard Specifications for Concrete Aggregates ASTM C 33. For concrete work that is 5" thick, the nominal size of the coarse aggregate should not exceed 1 1/2" and for concrete work that is 4" thick, the nominal size of the coarse aggregate should not be greater than 1". Fly ash or other additives are not acceptable.

F. Thickness of Concrete

Concrete work should be 5" thick.

G. Post-Tensioning

Post-tensioning material should consist of seven wire stress-relieved strands, conforming to ASTM A 416, with an ultimate strength of 270 KSI. Strands should be coated with a permanent rust preventative lubricant and wrapped with plastic sheathing. If strand sheathing is damaged or removed, it is to be repaired by taping. A maximum of 6" exposed strand is permitted at the anchor. End anchorage devices will conform to Post-

Tensioning Institute (PTI) specifications. All dead end anchorages must be power seated. All strands are to be supported on chairs and tied at all intersections or securely supported in beams to prevent vertical and horizontal movement during concrete placement. Cables should be laid out in grids at 3.5' on center. Concrete must be well consolidated, especially in the vicinity of strand anchorages. Strands should be anchored at 28.9 KIPS, but may be initially stressed at 33 KIPS. A 9" diameter centered on the strand axis by a 36" length should be allowed for stressing equipment clearance. The stressing process generates tremendous pressures and extreme care should be taken to prevent injury from operator error or failure of equipment or materials.

Slabs should be designed using acceptable engineering practices in accordance with the American Concrete Institute Building Code Requirements for reinforced concrete and the Post-Tensioning Institute's tentative specifications for post-tensioning materials. The soil condition and plasticity index of the court site should be considered in determining strand spacings and beam requirements.

H. Forms

Forms should be set accurately to the lines and grades indicated on drawings and secured to prevent settlement or movement during placing of concrete. Forms should remain in place until concrete has taken its final set.

I. Joints

1. Courts should be poured as a monolithic slab.
2. For multi-court banks, an accepted alternative expansion joint method would be to construct a common expansion joint between every two courts with a T-joint method. The cabling system can be continued through the system to allow for tension to be applied at the end of the total slab distance.

J. Concrete Proportioning and Mixing

The concrete should have a compressive strength of not less than 3,000 psi at 28th day after casting. Ready-mixed concrete should be mixed and delivered in accordance with ASTM C 94, Specification for Ready-Mixed Concrete with a 4" maximum slump.

K. Placing and Finishing

Concrete should be placed by pumping method. At least a full court should be placed in one continuous operation without intervening joints of any kind. Concrete should be spread, consolidated, screeded, bull-floated and finished in accordance with Section 7.2 of ACI (American Concrete Institute) Standard 302, Recommended Practice for Concrete Floor and Slab Construction. When concrete is sufficiently set to withstand foot pressure with only about 1/4" indentation and the water sheen has left the surface, the slab should be uniformly finished by power floating and troweling. The final finish texture should be a medium broom finish unless otherwise specified by the surface manufacturer. No curing compounds should be used at any time.

L. Surface Tolerances

The finished surface of the court should not vary more than 1/8" in 10' when measured in any direction.

M. Curing

Immediately after finishing, the concrete should be kept continuously moist for 7 days by covering with polyethylene film or waterproof curing paper, or by sprinkling or ponding or other acceptable coverings. No curing compounds should be used at any time. Curing time should be in accordance with surfacing system manufacturer's recommendations. Timing is critical on all of the above due to the possibility of disturbing the finished surface.

SECTION 13000

SHADE SHELTER

GENERAL: Shade Systems (or approved equal) products are designed and manufactured to the most exacting specifications by skilled craftsmen and certified by Professional Engineers for structural soundness of designs. All Shade Systems (or approved equal) are shipped knocked-down, with complete assembly instructions, and ready for easy in-field installation.

MATERIAL: All materials shall be structurally sound and appropriate for safe use. Product durability shall be ensured by the use of corrosion-resistant metals such as stainless steel, and coatings such as zinc-plating, galvanizing, and powder-coating on steel parts, subject to the Project-Specific requirements below. Fabrics used shall include UV-stabilizers and fire retardants for longevity and safety.

WELDMENTS: All tubing members are factory-welded by Certified Welders to American Welding Society (AWS) specifications and to the highest standards of quality workmanship. Weldments are finished with a zinc-rich galvanized coating. No field welding is required in the assembly of Shade Systems products (or approved equal).

POSTS, STRUCTURAL FRAME TUBING, AND HARDWARE: All tubing used shall be cold-formed and milled per ASTM A-135 and ASTM A-500. Material testing is in accordance with ASTM E-8. Minimum yield is 40,000 psi with a minimum tensile strength of 45,000 psi on all posts. All tubing shall be pre-cut to appropriate lengths, and where applicable all outside surfaces shall be galvanized, with an interior corrosion-resistant zinc-rich coating. Where required, support pipes shall be schedule 40 hot-dip galvanized or powder-coated black steel. All fastening hardware shall be stainless steel.

POLYESTER POWDER-COATING PROCESS: All powder-coated parts are completely cleaned and a hot zinc phosphate pretreatment with non-chromic sealer is applied. Powder-coating is then

electrostatically applied and oven-cured at 375 to 425 degrees Fahrenheit. Polyester powders shall meet or exceed ASTM standards for Adhesion, Hardness, Impact, Flexibility, Overbake Resistance, and Salt Spray Resistance. Colors shall be specified.

STANDARD FOOTINGS: Footings shall be designed per stringent International Building Code (IBC) for the specific structure. Columns will be provided as standard direct embedment. Other footing designs are available.

ROOFING: Structural frames are designed by Shade Systems (or approved equal) only for use with CoolNet™ polyethylene shade fabric (or approved equal). Fabric is attached to frame using a vinyl covered minimum 1/4" diameter stainless steel and clear vinyl coated cable. Cable fasteners are zinc-plated copper for maximum corrosion resistance.

ENGINEERING DATA: Structures are engineered to meet or exceed the requirements of International Building Code (IBC), and the following *standard* specifications:

- **Wind Speed (Frame only):**
- **Wind Speed (Frame w/canopy):**
- **Live Load:**
- **Snow Load:**
- 150 m.p.h.
- 90 m.p.h.
- None
- None

Optional designs with greater wind speeds, live loads, and snow loads are available.

FASTENING SYSTEM: CoolNet Shade Fabric (or approved equal) shall be delivered complete with independent cables pre-inserted in fabric hems. Each cable shall be looped and clamped at each end. Fastening System to consist of the Turn-N-Slide (or approved equal) fastening device factory installed at each roof rafter corner. The Turn-N-Slide (or approved equal) features a concealed mechanism which allows the attachment hook and sleeve at each rafter corner to move along a track in the rafter. Cables are attached to hook which is welded to the moving sleeve, thereby distributing tension evenly over rafters and not directly onto the mechanism. Rafters are sealed with no penetrations on the top side, thereby preventing water from entering. Such moving sleeve with hook allows the looped ends of each cable to slide over the hook when the sleeve is at its upper position, and then by turning the concealed fastener within the rafter, moves the sleeve with hook outward (toward end of the rafter), thereby tensioning the cables and securing the fabric at the proper tautness. A locking cap is secured at the end of each rafter with a vandal-resistant bolt (special wrench provided by the manufacturer) to prevent unauthorized access to the Turn-N-Slide (or approved equal) mechanism. To remove the canopy, the cap is removed, and the mechanism rotated counter-clockwise. The sleeve with hook moves inward (toward peak of roof), thereby de-tensioning the cables, and allows fast removal of the canopy. Continuous one-piece cables, cables which are not independent per side and pre-looped and clamped at the factory, and/or cables which must be tensioned with the use of turnbuckles or tools not provided by the manufacturer (other than a common deep socket) are not acceptable. Structures which do not feature the Fastening System on each and every rafter, or fastening mechanisms which do not feature a sealed top rafter and moving outer sleeve such as the Turn-N-Slide, are not acceptable.

FASTENING SYSTEM INSTRUCTIONAL VIDEO: Product must be delivered complete with a minimum 4-minute instructional video on USB Flash Drive. Video must show the viewer the exact

procedure for removing and re-attaching canopy using an actual shade structure in the field. Submittals which do not include the video on USB Flash Drive are not acceptable.

CoolNet™ SHADE FABRIC (or approved equal): Knitted of monofilament and tape construction high density polyethylene with Ultra Violet (U.V.) stabilizers and flame retardant. UV-Block Factor varies by standard color offered from 91% to 99%.

- **Nominal Thickness:**
- **Light Fastness:**
- **Weather Fastness:**
- **Tear Resistance:**
- **Breaking Force:**
- **Bursting Pressure:**
- **Bursting Force:**
- 0.057 inches
- Min. 337 g/m²
- 7-8 (Blue Wool Scale)
- 4-5 (Grey Scale Test)
- Warp 210N, Weft 276N
- Mean 3125kPa
- Mean 1775N

All hems and seams are double row lock stitched using exterior grade UV-stabilized polyethylene GORE TENARA (or approved equal) sewing thread (GORE and TENARA are trademarks of W. L. Gore & Associates).

FLAMMABILITY: CoolNet Shade Fabric (or approved equal) is treated with fire retardants, and passes the requirements established under the NFPA 701 Test Method 2 test standards for flammability, including the accelerated water leaching protocol. Written evidence of compliance with this standard, including the accelerated water leaching protocol, must be furnished with bid proposal.

[Click Here to See the Colors](#)

COLOR	WEIGHT (g/m ²)	SHADE FACTOR %	UVR BLOCK %
Canary Yellow	342	77	93
Eggshell White	342	79	95
Lime Green	400	87	94
Fire Orange	400	82	94
Hot Pink	400	89	95
Grape Purple	400	82	90
Desert Sand	322	84	95
Rivergum Green	318	86	93
Bright Red	342	81	91
Brick Red	340	95	94
Silver Grey	318	92	97
Light Blue	348	95	97
Navy Blue	316	96	99
Aquatic Blue	348	88	94
Forest Green	340	96	97

PLEASE NOTE: Because of our commitment to continuous product development and improvement, Shade Systems reserves the right to change specifications at any time without notice.

WARRANTY: Shade Systems, Inc. (or approved equal) warrants that the equipment sold will conform in kind and quality to the specifications listed in the Order Acknowledgment and will be free of defects in workmanship or materials. Shade Systems (or approved equal) further warrants:

- LIMITED 20 YEAR WARRANTY on all upright posts and support structure frames against failure due to rust-through corrosion. This warranty excludes any cosmetic issues.

-
- LIMITED 10 YEAR WARRANTY on all CoolNet (or approved equal) fabrics and GORE TENARA (or approved equal) stitching thread against degradation, cracking or material breakdown resulting from ultra-violet exposure, mold, or mildew, as well as on Turn-N-Slide (or approved equal) fastening device and cables. This warranty excludes failure of fabric or threads due to chemical erosion.
 - LIMITED 1 YEAR WARRANTY for structural failure of moving parts, powder-coat finish, or any other product or part not covered by one of the above warranties.

The above warranties are not pro-rated. Please refer to the full text of our complete Limited Warranty for additional details and other important warranty information.

INSURANCE: Manufacturer shall show evidence of Commercial Product Liability/Completed Operations insurance coverage on its products in an amount of no less than \$2,000,000 aggregate written on the Occurrence Form.

MANUFACTURER EXPERIENCE: Bidder must show evidence of at least six (6) public municipal installations where manufacturer's product as proposed pursuant to this bid has been installed and has been in continuous use for a minimum of five (5) years each.

ALTERNATE PRODUCT APPROVAL PROCEDURE: Ten (10) day prior approval required for substitution of product design, materials and features specified above. Submittals must include plans, drawings, cut sheets, material data sheets, testing results and samples. Bids failing to meet this requirement will be deemed non-responsive.

SECTION 312300
EXCAVATION AND BACKFILL

PART 1 - GENERAL

1.01 Description

Scope:

- A. The CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to perform all excavating, backfilling and disposing of earth materials as shown, specified, and required for the purpose of constructing conduits, pipelines, roads, ditches, grading, and other facilities required to complete the Work in every respect.
- B. All necessary preparation of subgrade for slabs and pavements is included.
- C. All temporary means needed to prevent discharge of sediment to water courses because of dewatering systems or erosion is included.
- D. Excavation includes all materials regardless of type, character, composition, moisture, or condition thereof.

1.02 Quality Assurance

- A. Tests:
 - 1. The CONTRACTOR shall retain the services of a qualified testing laboratory to make tests and determine acceptability of the soil as listed below.
 - 2. The CONTRACTOR shall give full cooperation to the testing lab personnel so that the required soil tests can be taken in an efficient and timely manner.
 - 3. Required Tests:
 - a. Select Fill and Backfill Samples:
 - (1) Gradation, ASTM D 422.
 - (2) Liquid Limit, ASTM D 423.
 - (3) Plastic Limit and Plasticity Index, ASTM D 424.
 - b. Compacted Select Fill and Backfill: Compaction, ASTM D 698.
- B. Permits and Regulations:
 - 1. The CONTRACTOR shall obtain all necessary permits for work in roads, rights-of-way, railroads, etc.
 - 2. The CONTRACTOR shall obtain permits as required by local, state and federal agencies for discharging water from excavations to rivers and streams.
 - 3. The CONTRACTOR shall perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.
- C. Reference Standards: The CONTRACTOR shall comply with applicable provisions and recommendations of the following except as otherwise shown or specified.
 - 1. ASTM A 36, Structural Steel.
 - 2. ASTM A 328, Steel Sheet Piling.

3. ASTM D 422, Particle-Size Analysis of Soils.
4. ASTM D 423, Liquid Limit of Soils.
5. ASTM D 424, Plastic Limit and Plasticity Index of Soils.
6. ASTM D 448, Standard Sizes of Coarse Aggregate for Highway Construction
7. ASTM D 698, Moisture-Density Relations of Soils, Using 5.5 lb (2.5 kg) Rammer and 12-in. (304.8 mm) Drop.
8. ASTM D 1556, Density of Soil in Place by the Sand-Cone Method.
9. ASTM D 2487, Classification of Soils for Engineering Purposes.
10. ASTM D 2922, Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

D. Related Work Specified Elsewhere: Geotechnical Report upon request.

1.03 Submittals

The CONTRACTOR shall submit samples of all select backfill, fill, gravel, base, and pipe bedding materials required.

1.04 Job Conditions

A. Subsurface Information:

1. Subsurface investigation report will be available upon request. Data on subsurface conditions is not intended as a representation or warranty of continuity of such conditions between soil borings. The ENGINEER will not be responsible for interpretations or conclusions drawn therefrom by the CONTRACTOR.
2. Additional test borings and other exploratory operations may be made by CONTRACTOR at no cost to OWNER.

B. Existing Structures and Utilities:

1. Shown on the Drawings are certain surface and underground structures adjacent to the Work. This information has been obtained from existing records. It is not guaranteed to be correct or complete and is shown for the convenience of the CONTRACTOR. CONTRACTOR shall explore ahead of the required excavation to determine the exact location of all structures. All structures shall be supported and protected from injury by the CONTRACTOR. If they are broken or injured, they shall be restored immediately by the CONTRACTOR at his expense.
2. The CONTRACTOR shall locate existing underground utilities in the areas of Work. If utilities are to remain in place, the CONTRACTOR shall provide adequate means of protection during earthwork operations. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult the ENGINEER immediately for directions as to procedure. Cooperate with the OWNER and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
3. Do not interrupt existing utilities serving facilities occupied and used by the OWNER or others, except when permitted in writing by the ENGINEER and then only after acceptable temporary utility services have been provided.

C. Use of Explosives: Not permitted on the job site.

D. Protection of Property:

1. Barricade open excavations occurring as part of this Work and post with warning lights.
 2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
 3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
- E. Dust Control: Conduct all operations and maintain the area of activities, including sweeping and sprinkling of roadways, so as to minimize creation and dispersion of dust. Use calcium chloride to control serious or prolonged dust problems.

PART 2 – PRODUCTS

2.01 Soil Materials

- A. Select Bedding and Backfill: Select Bedding shall be size 67 washed gravel as specified in section 703 of the *Mississippi Standard Specifications for Road & Bridge Construction 2017 Edition*. Select backfill shall be granular material, Class 6, Group C as specified in section 703 of the *Mississippi Standard Specifications for Road & Bridge Construction 2017 Edition*.
- B. General Backfill and Fill Material: Unless noted otherwise, provided material shall also meet the following requirements:
1. Free of clay, rock or gravel larger than 6 inches in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter.
 2. Fill shall consist of any non-organic soil, free of debris and capable of being placed and compacted to the specified densities.
- C. Sand Material: Sand material for the drain board system shall be a clean sand having a maximum of 10% passing the No. 200 sieve.
- D. All costs associated with tests required by the ENGINEER to verify that material obtained either on-site or off-site meets the above requirements shall be borne by the CONTRACTOR.
- E. Geotextile Fabric: If required, Geotextile fabric shall be a Type V, Non-woven as specified in Section 714.13 of the “Mississippi Standard Specifications for Road and Bridge Construction”, 2017 Edition.

PART 3 – EXECUTION

3.01 Inspection

The CONTRACTOR will examine the areas and conditions under which excavating, filling, and grading are to be performed and notify the ENGINEER of conditions the CONTRACTOR may

find that are detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in an acceptable manner.

3.02 Site Preparation

The CONTRACTOR shall clear all areas to be occupied by permanent construction of all trees, brush, roots, stumps, logs, wood and other materials and debris. Subgrades for fills shall be cleaned and stripped of vegetation, sod, topsoil and organic matter.

3.03 Test Pits

- A. Where ordered by the ENGINEER, the CONTRACTOR shall excavate and backfill, in advance of construction, test pits to determine conditions or location of existing facilities.
- B. The CONTRACTOR shall perform all work required in connection with excavating, stockpiling, maintaining, sheeting, shoring, backfilling and replacing pavement for the test pits.

3.04 Excavation

- A. General:
 - 1. Scope: Perform all excavation required to complete the Work as shown and specified.
 - 2. Excavated Materials: Earth, sand, clay, gravel, hardpan, boulders not requiring drilling or jackhammering to remove, decomposed rock, pavements, sediment, rubbish and all other materials within the excavation limits.
- B. Structures and Pipelines:
Excavations: Open excavations shall be constructed to prevent damage to new and existing structures or pipelines.
- C. Dewatering:
 - 1. Placement Below Groundwater Table: Use well points, cofferdams or other acceptable methods to permit construction of said structure or pipeline under dry conditions.
 - 2. Pipelines: Maintain dry conditions until the pipelines are properly jointed and backfilled.
 - 3. Water Level: Maintain water level at least one foot below trench bottom at all times.
 - 4. Under no conditions shall water be permitted to stand in the bottom of an excavation for more than 24 hours.
 - 5. The use of sanitary sewers for disposal of water from dewatering operations is prohibited.
- D. Pumping: Pump excavations in such a manner to prevent the carrying away of unsolidified concrete materials and to prevent damage to the existing subgrade.
- E. Size of Excavations: Extend excavation sufficiently on each side of structures, footings, etc., to permit setting of forms, installation of sheeting, the safe sloping of banks, or etc.

F. Subgrades:

1. Subgrade Requirements for Fill Areas, Roadways, and Trench Bottoms:
 - a. Strong, dense, and thoroughly compacted and consolidated.
 - b. Free from mud, muck and other soft or unsuitable materials.
 - c. Remain firm and intact under all construction operations.
2. All subgrades shall be proof-rolled with a loaded dumptruck or other suitable equipment approved by the Engineer. Any area that “pumps” is considered a soft subgrade and shall be corrected as specified in paragraph 3.04.F.3.
3. Soft Subgrades: Subgrades which are otherwise solid, but which become soft or mucky on top due to construction operations, shall be removed and replaced or processed to establish a stable surface. Soft area shall be proof-rolled after corrective action has been taken.
4. Finished Elevation of Stabilized Subgrades: Do not place finished elevation of stabilized subgrades above subgrade elevations shown on the Drawings.

G. Stability of Excavations:

1. Sides of Excavations: Slope sides of excavations to comply with codes and ordinances of agencies having jurisdiction.
2. Shoring and Bracing: Shore and brace excavations where sloping is not possible either because of space restrictions or stability of material excavated.
3. Caving: If caving occurs outside the excavation area, backfill the resulting hole in accordance with the requirements of this section after removing the loose material.

H. Pipe Trench Preparation:

1. No more than 200 feet of trench may be opened in advance of pipe laying.
2. Trench width shall be minimized to greatest extent practical but shall conform to the following:
 - a. Sufficient to provide room for installing, jointing and inspecting piping, but in no case wider than allowed by the typical trench details shown on the Drawings.
 - b. Enlargements at pipe joints may be made if required and approved by the ENGINEER.
 - c. Sufficient for sheeting, bracing, sloping, and dewatering.
 - d. Sufficient to allow thorough compacting of pipe bedding material.
 - e. Excavating equipment which requires the trench to be excavated to excessive width will not be used.
3. Depth of trench shall be as shown on the Drawings.

I. Material Storage:

1. Stockpile satisfactory excavated materials in approved areas, until required for backfill or fill.
2. Place, grade and shape stockpiles for proper drainage.
3. Locate and retain soil materials away from edge of excavation.
4. Dispose of excess soil and waste materials as specified hereinafter.

J. Unsuitable Material: Where the existing material beneath the subgrade is considered unsuitable by the ENGINEER, remove and replace it with sand backfill or bedding material as directed by the ENGINEER.

3.05 Unauthorized Excavation

- A. Limits: All excavation outside the lines and grades shown on the Drawings.
- B. Responsibility: All unauthorized excavation together with the removal and disposal of the associated materials is at the CONTRACTOR'S expense.
- C. Backfill and compact the unauthorized excavation with select backfill and at the CONTRACTOR'S expense.

3.06 Drainage and Dewatering

- A. General:
 - 1. Prevent surface and subsurface water from flowing into excavations and from flooding adjacent areas.
 - 2. Remove water from excavation as fast as it collects.
 - 3. Maintain the ground water level below the bottom of the excavation to provide a stable surface for construction operations, a stable subgrade for the permanent work, and to prevent damage to the Work during all stages of construction.
 - 4. Provide and maintain pumps, sumps, suction and discharge lines and other dewatering system components necessary to convey water away from excavations.
 - 5. Obtain the ENGINEER'S approval before shutting down dewatering system for any reason.
- B. Standby Requirements for Dewatering: Provide standby equipment to ensure continuity of dewatering operations.
- C. Disposal of Water Removed by Dewatering System:
 - 1. Dispose of all water removed from the excavation in such a manner as not to endanger public health, property, or any portion of the Work under construction or completed.
 - 2. Dispose of water in such a manner as to cause no inconvenience to the OWNER, ENGINEER, or others involved in work about the site.
 - 3. Convey water from the construction site in a closed conduit. Do not use trench excavations as temporary drainage ditches.

3.07 General and Select Backfill

- A. General: Furnish, place and compact all backfill required for excavations and trenches as required to provide the finished grades shown and as described herein.
- B. Restrictions: Backfill excavations as promptly as Work permits, but not until completion of the following:
 - 1. Reviewed by ENGINEER of construction below finish grade including dampproofing, waterproofing, and perimeter insulation, where applicable.
 - 2. Inspection, testing, approval, and recording of locations of underground utilities.
 - 3. Removal of concrete formwork.

4. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required.
 5. Removal of trash and debris.
 6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.
- C. Placement:
1. Keep excavation dry during backfilling operations. At no time shall water be permitted to stand in the bottom of an excavation for more than 24 hours.
 2. Bring up backfill evenly on all sides around structures and piping.
 3. It is intended that the elevations, lines, grades and typical sections (after settlement and compaction during construction) shall be those shown on the Drawings.
- D. Pipe Trenches:
1. Place all select backfill in pipe trenches which are below structures, other pipes, roadway areas, or as shown on drawings, in horizontal loose lifts not exceeding 6 inches in depth and thoroughly compacted before the next layer is placed.
 2. Place all general backfill in other pipe trenches in horizontal loose lifts of 6 inches and compact as required.
- E. Rock Excavation:
1. Where pipe is laid in rock excavation, provide a minimum of 4 inches of sand under pipes smaller than 4 inches and a minimum of 6 inches of crushed stone or gravel under piping 4 inches and larger.
 2. After laying pipe, place the balance of the backfill as described herein.
- F. Moisture:
1. In general, maintain the moisture content of the backfill within 5 percent of the optimum moisture content for compaction as determined by laboratory tests.
 2. Perform all necessary work to adjust the water content of the material to within the range necessary to permit the compaction specified.
 3. Do not place backfill material when free water is standing on the surface of the area where the backfill is to be placed.
 4. No compaction of backfill will be permitted with free water on any portion of the backfill to be compacted.
- G. Unacceptable Material:
1. Do not place or compact backfill in a frozen condition or on top of frozen material.
 2. Remove backfill containing organic materials or other unacceptable material and replace with approved backfill material.
- H. Equipment:
1. Compact backfill with equipment suitable for the type of material placed and which is capable of providing the densities required.
 2. Select compaction equipment and submit it and proposed procedure to the ENGINEER for approval.

3. All backfill within one foot horizontally from structural walls shall be compacted to the specified density using hand-operated mechanical tampers.
- I. Coverage:
 1. Compact backfill by at least two coverages of all portions of the surface of each lift by compaction equipment.
 2. One coverage is defined as the condition obtained when all portions of the surface of the backfill material have been subjected to the direct contact of the compactor.
 - J. Compaction:
 1. Minimum Density for Select and Initial Backfill: compact from horizontally-placed loose lifts not exceeding nine (9) inches in thickness to a density which is equal to 95% of maximum density obtained in the laboratory in accordance with ASTM D 698 Method C including Note 2 for cohesive soils or at least 70% relative density in accordance with ASTM D 4254 for granular soils. The top 12 inches of select cohesive backfill shall be compacted to 97% Standard Proctor.
 2. Minimum Standard Proctor Density for General Backfill: Compact to a density of not less than that of the surrounding soil.
 3. If the field and laboratory tests indicate unsatisfactory compaction, provide the additional compaction necessary to obtain the specified degree of compaction.
 - K. Inadequate Compaction:
 1. If the specified densities are not obtained because of improper control of placement or compaction procedures, or because of inadequate or improperly functioning compaction equipment, perform whatever work is required to provide the required densities.
 2. This work includes complete removal of unacceptable backfill areas and replacement and re-compaction until acceptable backfill is provided.
 - L. Settlement:
 1. Repair any settlement that occurs, at CONTRACTOR'S expense.
 2. Make all repairs and replacements necessary within 30 days after notice from the ENGINEER or OWNER.

3.08 General and Select Fill

- A. Locations:
 1. Provide select fill in the following locations:
 - a. Support below and around piping and foundations.
 - b. Subgrade for roadway areas, driveways, and sidewalks.
 - c. Where shown on drawings or directed by the ENGINEER.
 2. Provide general fill material in all other places.
- B. Restrictions:
 1. Make subgrade surface level, dry, firm and subject to the ENGINEER'S approval.
 2. Do not place fill if any water is on the surface of area to receive fill.
 3. Do not place or compact fill in a frozen condition or on top of frozen material.

- C. Thickness of Lifts:
1. Place select fill in horizontal loose lifts of 6 inches maximum thickness.
 2. Place general fill in horizontal loose lifts of 9 inches maximum thickness.
 3. Mix and spread in a manner to assure uniform lift thickness after placing.
 4. Compact each layer of fill before placement of the next lift.
- D. Unacceptable Material:
1. Do not place fill containing lumps, pockets or concentrations of silt or clay, rubble, debris, wood or other organic matter.
 2. Remove and dispose of fill containing unacceptable material.
- E. Moisture:
1. In general, maintain the moisture content of the backfill within 5 percent of the optimum moisture content for compaction as determined by laboratory tests.
 2. Wet or dry the fill materials during placement to achieve water contents needed for effective compaction.
 3. Do not place fill material when free water is standing on the surface of the area where the fill is to be placed.
 4. No compaction of fill will be permitted with free water on any portion of the fill to be compacted.
- F. Equipment:
1. Perform compaction of fill with equipment suitable for the type of fill material being placed.
 2. Select equipment which is capable of providing the densities required and submit the equipment to the ENGINEER for review.
 3. Vibratory rollers or vibratory plate compactors are suitable for compaction of structural fill.
 4. All fill within one foot horizontally from structural walls shall be compacted to the specified density using hand- operated mechanical tampers.
- G. Coverage:
1. Compact each layer of fill material by at least two complete coverages of all portions of the surface of each lift using suitable compaction equipment.
 2. One coverage is defined as the condition reached when all portions of the fill lift have been subjected to the direct contact of the compacting surface of the compactor.
- H. Compaction:
1. Minimum Standard Proctor Density for Select Fill: 95 percent of the maximum density obtained in the laboratory in accordance with ASTM D 698 Method C including Note 2. The top 12 inches of select fill shall be compacted to 97 percent Standard Proctor.
 2. Minimum Standard Proctor Density for General Fill: 85 percent of the maximum density obtained in the laboratory in accordance with ASTM D 698 Method C including Note 2.
 3. If the field and laboratory tests indicate unsatisfactory compaction, provide the additional compaction necessary to obtain the specified degree of compaction.

- I. Inadequate Compaction:
 - 1. If the specified densities are not obtained because of improper control of placement or compaction procedures, or because of inadequate or improperly functioning compaction equipment, perform whatever work is required to provide the required densities.
 - 2. This work includes complete removal of unacceptable fill areas and replacement and re-compaction until acceptable fill is provided.
- J. Disturbed Materials:
 - 1. Provide, place and compact select fill necessary to replace subgrade materials disturbed and softened as a result of the CONTRACTOR's operations.
 - 2. Furnish additional fill at CONTRACTOR's expense.
- K. Settlement:
 - 1. Repair any settlement that occurs, at CONTRACTOR's expense.
 - 2. Make all repairs and replacement necessary within 30 days after notice from the ENGINEER or OWNER.

3.09 Grading

- A. General:
 - 1. Uniformly grade areas within limits of grading under this Section, including adjacent transition areas.
 - 2. Smooth subgrade surfaces within specified tolerances.
 - 3. Compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.
- B. Compaction: After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification.

3.11 Disposal of Excavated Materials

Excess or Unsuitable Material:

- A. Haul away from the project site all material removed from the excavations which does not conform to the requirements for fill or backfill or is in excess of that required for backfill.
- B. Dispose of excess or unsuitable material in compliance with municipal, county, state, federal or other applicable regulations at no additional cost to the OWNER.

3.12 Field Quality Control

- A. Quality Control Testing During Construction:
 - 1. Testing lab will inspect and approve subgrades and fill layers before further construction work is performed thereon.
 - 2. Testing lab will test excavated material for backfill in accordance with paragraph 1.02.A.3 at a rate of one set of tests every 200 feet or as directed by the Engineer.

3. Tests of subgrades, backfill and fill layers shall be taken as follows:
 - a. Pipeline Installation, Roadway and Driveway Crossings: One field density for each crossing for each lift of backfill placed. Placement of test will be as determined by ENGINEER.
 - b. Pipeline Installation, Running in Roadways: One field density for every 200 feet of pipe installed for each lift of backfill placed. Placement will be as determined by ENGINEER.
- B. Unsuitable Compaction: If, based on reports of testing lab and inspection, subgrade, backfills or fills which have been placed are below specified density, provide additional compaction at no additional expense to the OWNER.

*** * END OF SECTION * ***

SECTION 330523.10
BURIED PIPING INSTALLATION

PART 1 – GENERAL

1.01 Description

- A. Scope:
 - 1. CONTRACTOR shall furnish all labor, materials, equipment and incidentals as shown, specified and required to install all buried piping, fittings, and specials.
 - 2. The Work includes, but is not limited to, the following:
 - a. All types of buried piping unless specifically included under other Sections.
 - b. Pipe beneath structures.
 - c. Testing.
 - d. Also included are installation of all jointing and gasketing materials, specials, couplings, and all other Work required to complete the piping installation.
 - e. All appurtenances and specials shown, specified or required shall be incorporated into the piping systems.
- B. Coordination: Review installation procedures under other Sections and coordinate with the Work that is related to this Section.
- C. Related Work Specified Elsewhere: Section: Excavation and Backfill.

1.01 Quality Assurance

- A. Requirements of Regulatory Agencies:
Comply with applicable requirements of UL and other authorities having jurisdiction.
- B. Comply with the requirements of the Mississippi State Department of Health, Division of Water Supply for separation of water and sewer mains.
- C. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
 - 1. C600 AWWA Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances.
 - 2. C111/A21.11 American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
 - 3. C651 AWWA Standard for Disinfecting Water Mains.
 - 4. AWWA M23, PVC Piping.

1.02 Submittals

- A. Shop Drawings: Submit for approval the following:
 - 1. Size, class and other details of pipe to be used.
 - 2. Information on typical joint and harnessing details.

3. Laying schedules and detailed drawings in plan and profile for all piping, except as noted below.
 4. Schedules and drawings for buried piping less than four inches are required only if specifically requested by the ENGINEER.
- B. Tests: Submit description of proposed testing methods, procedures and apparatus. Submit copies of all test reports.

1.03 Product Delivery, Storage and Handling

- A. Delivery, storage and handling of pipe, fittings and specials shall be in complete compliance with the manufacturer's recommendations.
- B. Handle all pipe, fittings and accessories carefully with approved handling devices. Do not drop or roll pipe off trucks. Do not otherwise drop, roll or skid pipe. Materials cracked, gouged, chipped, dented or otherwise damaged will not be approved.
- C. Store pipe and fittings on heavy wood blocking or platforms so they are not in contact with the ground.
- D. Pipe, fittings and specials shall be unloaded opposite to or as close to the place where they are to be laid as is practicable to avoid unnecessary handling. Interiors shall be kept completely free from dirt and foreign matter.

PART 2 – PRODUCTS

2.01 Materials

- A. Pipe materials are specified under each applicable pipe material Specification Section.
- B. Pipe Marking:
 1. General:
 - a. Each piece of pipe or fitting shall be clearly marked with a designation which shall conform with designations shown on the Shop Drawings.
 - b. Class designation shall be cast or painted on each piece of pipe or fitting four inches in diameter and larger.
 2. Underground Warning Tape:
 - a. CONTRACTOR shall place an aluminum core, detectable warning tape approximately 12 to 18 inches below grade in all Plastic Pipe trenches.
 - b. Raw water, settled water, or finished water plastic piping warning tape:
 - (1) Message: "CAUTION – BURIED WATER LINE."
 - (2) Size and Color: 3-inch wide blue background with black lettering.
 - c. Product and Manufacturer: Provide one of the following;
 - (1) Terra Tape Sentry Line by Reef Industries, Inc.
 - (2) Or equal.
 3. Tracer Wire:
 - a. CONTRACTOR shall place a 14 gauge or heavier (smaller AWG number), solid, insulated, copper wire as indicated in the Contract Drawings.

- b. The wire must be one continuous, unbroken length and is to be coiled at meters, valves, and bored crossings.

PART 3 – EXECUTION

3.01 Installation

- A. General:
 - 1. Install piping as shown, specified and as recommended by the manufacturer.
 - 2. Request instructions from ENGINEER before proceeding if there is a conflict between the manufacturer's recommendations and the Drawings or Specifications.
 - 3. Pipe, fittings and accessories that are cracked, damaged or in poor condition or with damaged linings will be rejected.
 - 4. Minimum cover over piping shall be 3 feet unless otherwise shown or approved by ENGINEER.
- B. Maintain separation of sanitary piping from water mains in accordance with the following:
 - 1. Sanitary sewer shall be laid at least 10 feet horizontally and 18" vertically from any water lines with water lines always located above sewer lines.
 - 2. All other scenarios shall be approved on a case by case basis.
- C. Bedding Pipe:
 - 1. Select bedding material used around and under pipes shall have the following properties:
Size 67 washed gravel of Section 703.03 of the *Mississippi Standard Specifications for Road and Bridge Construction*.
 - 2. Bedding Ductile-Iron and Concrete Pipe: As specified in 312300.
 - 3. Bedding PVC and HDPE Pipe: As specified in 312300.
 - 4. Select Backfill Material: Select material for backfilling pipe trenches shall be as specified in 312300.
 - 5. No piping shall be laid until ENGINEER approves the bedding condition.
 - 6. No pipe shall be brought into position until the preceding length has been bedded and secured in its final position.
 - 7. All ledge rocks, boulders, and large stones shall be removed during trench excavation to provide a minimum clearance of four inches below and on each side of all pipe.
- D. Laying Pipe:
 - 1. Comply with manufacturer's instructions and with ASTM D 2321, AWWA C600 or AWWA M9, where applicable.
 - 2. Install all pipe accurately to line and grade shown unless otherwise approved by ENGINEER. Remove and relay pipes that are not laid correctly.
 - 3. Slope piping uniformly between elevations given.
 - 4. Ensure that water level in trench is at least 6 inches below bottom of pipe. Do not lay pipe in water. Maintain dry trench until jointing and backfilling are complete.
 - 5. Start laying pipe at lowest point and proceed towards the higher elevations, unless otherwise approved by ENGINEER.
 - 6. Place bell and spigot pipe so that bells face the direction of laying, unless otherwise approved by ENGINEER.
 - 7. Excavate around joints in bedding and lay pipe so that only the barrel receives bearing pressure from the trench bottom.

8. Permissible deflections at joints shall not exceed the amount allowed by manufacturer.
9. Take every precaution to ensure that no foreign material enters the piping prior to and during installation.
10. All pipe and fittings shall be carefully examined for cracks, damage or other defects while suspended above the trench before installation. Defective materials shall be immediately removed from site.
11. Interior of all pipe and fittings shall be inspected and all dirt, gravel, sand, debris or other foreign materials shall be completely removed from pipe interior before it is moved into the trench.
12. Bell and spigot mating surfaces shall be thoroughly wire brushed and wiped clean and dry immediately before pipe is laid.
13. Every time that pipe laying is not actively in progress the open ends of pipe shall be closed by a watertight plug.
14. Field cutting pipe, where required, shall be made with a machine specially designed for cutting piping. Cuts shall be carefully done, without damage to pipe or lining, so as to leave a smooth end at right angles to the axis of pipe. Cut ends shall be tapered and sharp edges filed off smooth. Flame cutting will not be allowed.
15. Blocking under piping shall be permitted only when accepted by ENGINEER for special conditions.
16. Touch up protective coatings in a satisfactory manner prior to backfilling.
17. All piping shall be inspected by the ENGINEER prior to any backfilling operations. CONTRACTOR shall notify the ENGINEER in advance of any backfilling operation.
18. Joint restraints shall installed as recommended by the manufacturer to restrain the pipe at each fitting as indicated elsewhere in the contract documents.

E. Jointing Pipe:

1. General:
 - a. Clean completely all jointing surfaces and adjacent areas immediately before mating joint.
 - b. Lubricate and adjust gaskets as recommended by manufacturer.
 - c. After gaskets are compressed and before pipe is brought fully home, each gasket shall be carefully checked for proper position around full circumference of the joint.
 - d. Conform to AASHTO MP6, AWWA C111 and to manufacturers recommendations pertaining to jointing pipe.
2. Push-on Joints: Comply with AASHTO MP6, AWWA C111 or to manufacturers recommendations pertaining to jointing pipe.

F. Transitions from One Type of Pipe to Another:

1. Provide all necessary adapters, specials and connection pieces required when connecting different types and sizes of pipe or when connecting pipe made by different manufacturers.
2. Encase all such connecting joints with 6 inches minimum of concrete unless otherwise shown, specified or recommended by manufacturer.

- G. Closures:
 - 1. Provide all closure pieces shown or required to complete the Work.
 - 2. Locate closures in straight runs of pipe.
- H. Backfilling:
 - 1. Conform to applicable requirements of the Division 31 Specifications.
 - 2. Backfill by hand and use hand or pneumatic tamping until pipe is covered by at least one foot of backfill.

3.02 Work Affecting Existing Piping

- A. Location of Existing Piping:
 - 1. Locations of existing piping shown should be considered approximate.
 - 2. CONTRACTOR is responsible for determining exact location of existing piping to which he must make connections, or which he may disturb during earth moving operations, or which may be affected by his work in anyway.
- B. Work on Existing Pipelines:
 - 1. Cut pipes as shown or required with machines specifically designed for this work.
 - 2. Install temporary plugs to keep out all mud, dirt, water and debris.
 - 3. Provide all necessary adapters, fittings, pipe and appurtenances required.

3.03 Testing of Piping

- A. General:
 - 1. Pressure and leakage tests of all piping shall be completed and conform to the current AWWA Standard C600, Section 4.
 - 2. Notify ENGINEER 48 hours in advance of testing.
 - 3. Provide all testing apparatus, including pumps, hoses, gages, and fittings.
 - 4. Pipelines shall hold the specified test pressure for a period of 2 hours.
 - 5. Pipelines which fail to hold specified test pressure or which exceed the allowable leakage rate shall be repaired and retested.
 - 6. Test pressures required are at the lowest elevation of the pipeline section being tested unless otherwise specified.
 - 7. Unless otherwise approved, conduct all tests in the presence of the ENGINEER.
- B. Schedule of Pipeline Testing: Piping shall be tested at least 10 psi greater than its maximum operating pressure. If unknown, 100 psi shall be the pressure utilized during the testing procedure.
- C. Pressure Test Procedure:
 - 1. Backfill and compaction shall be completed at least to the pipe centerline before testing, unless otherwise required or approved by ENGINEER.
 - 2. Allow concrete for blocking to reach design strength before testing.
 - 3. Fill section to be tested slowly with water and expel all air.
 - 4. Test only one section of pipe at a time.
- D. Leakage Testing:
 - 1. Maintain test pressure constantly for a 2 hour period and accurately measure the amount of water which must be added to maintain the test pressure.

2. Allowable Leakage Rates (in gallons per hour per 1,000 feet per inch diameter):
 - a. Ductile-Iron Pipe: 0.1
 - b. PVC and Thermoplastic: No leakage.

3.04 Cleaning and Disinfection

- A. All water main piping shall be thoroughly cleaned and flushed in a manner approved by ENGINEER prior to placing in service.
 1. Piping 24 inches diameter and larger shall be inspected from inside and all debris, dirt and foreign matter removed.
- B. Disinfection:
 1. Disinfect all water mains, filtered water and other potable water piping.
 2. Flush piping prior to disinfection with water at a minimum velocity of 2-1/2 feet per second.
 3. Conform to procedures described in AWWA C651 unless otherwise approved by ENGINEER.
 4. Water for flushing, testing and chlorination shall be furnished and paid for by the CONTRACTOR.
 5. Chlorine will be supplied by CONTRACTOR.
 6. Chlorine concentration in the water entering the piping shall be between 50 and 100 parts per million, such that a minimum residual concentration of 25 mg/l will be left after a 24 hour retention period. The operation shall be repeated as necessary to provide complete disinfection.
 7. Bacteriologic tests will be performed by OWNER. Upon completion of construction and disinfection of water distribution lines, the CONTRACTOR shall arrange for at least one microbiological water sample to be collected by the Certified Operator for the system from every dead-end line and every major looped line. Water being collected shall not have a chlorine residual higher than is normally maintained in other parts of the distribution system. Disposal of highly chlorinated water from disinfection of the water lines may require a permit from the DEQ/Office of Pollution Control. The CONTRACTOR shall be responsible for obtaining any applicable permits. No chlorine shall be present which is a result of line disinfection. A sample showing "No Coliform Present" shall constitute a satisfactory sample when analyzed by the Mississippi Department of Health environmental laboratory or a laboratory certified by the MSDH.

**** END OF SECTION ****

SECTION 331113
PUBLIC WATER UTILITY DISTRIBUTION PIPING

PART 1 – GENERAL

1.01 Description

- A. Scope:
1. Furnish all labor, materials, equipment and incidentals for Public Water Utility Pipe systems.
 2. The Work includes, but is not limited to, the following:
 - a. All types of buried piping unless specifically included under other Sections.
 - b. Pipe beneath structures.
 - c. Supports and restraints.
 - d. Testing.
 - e. Cleaning and disinfecting.
 - f. Also included are installation of all jointing and gasketing materials, specials, couplings, harnessed and flanged adapters, sleeves, tie rods, and all other Work required to complete the piping installation.
 - g. All valves, gates, appurtenances and specials shown, specified or required shall be incorporated into the piping systems. Valves, specials and appurtenances shall be as specified in other sections.
 3. The extent of piping is shown on the Drawings and in the schedules.
- B. Coordination: Review installation procedures under other Sections and coordinate the Work that must be installed with the materials specified herein and which is related to this Section.

1.02 Quality Assurance

- A. Source Quality Control:
1. Obtain pipe from no more than one manufacturer.
 2. Obtain fittings from no more than one manufacturer.
- B. Reference Standards: Comply with the latest editions of the following:
1. AWWA C104 (ANSI A21.4), Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
 2. AWWA C105 (ANSI A21.5), Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids.
 3. AWWA C110 (ANSI A21.10), Gray-Iron and Ductile-Iron Fittings, 3 in. through 48 in., for Water and Other Liquids.
 4. AWWA C111 (ANSI A21.11), Rubber Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
 5. AWWA C150 (ANSI 21.50), Thickness Design of Ductile-Iron Pipe.
 6. AWWA C151 (ANSI A21.51), Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.

7. AWWA C153 (ANSI A21.53), Ductile-Iron Compact Fittings for Water Service.
8. ASTM D 1784, Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
7. ASTM D 2241, Standard Specification for Poly(VinylChloride)(PVC) Pressure-Rated Pipe.
8. ASTM D 3034, Type PSM Poly(Vinyl Chloride) (PVC Sewer Pipe and Fittings).
9. ASTM D 3261, ASTM F 2206, ASTM 2513

1.03 Submittals

- A. Shop Drawings and Product Data: Comply with the general requirements and the supplemental requirements.
- B. Submit for approval the following:
 1. Size, class and other details of pipe to be used.
 2. Information on typical joint and harnessing details.
- C. Tests: Submit description of proposed testing methods, procedures and apparatus. Submit copies of all test reports.
- D. Record Drawings: Comply with the general requirements and the supplemental requirements. During progress of the Work, keep an up to date set of drawings showing field modifications. Submit drawings at a scale satisfactory to the ENGINEER that show the actual in-place installation of all piping and appurtenances installed under this Section. The drawings shall show all piping on plans with all reference dimensions and elevations required for complete record drawings of the piping systems. The drawings shall be furnished not later than 30 days after Substantial Completion of the Work.

1.04 Delivery, Storage and Handling

- A. Delivery, storage and handling of pipe, fittings, and specials shall be in complete compliance with the manufacturer's instructions.
- B. Handle all pipe, fittings and accessories carefully with approved handling devices. Do not drop or roll pipe off trucks. Do not otherwise drop, roll or skid pipe. Materials cracked, gouged, chipped, dented or otherwise damaged will not be approved.
- C. Pipe, fittings and specials shall be unloaded opposite to or as close to the place where they are to be laid as is practicable to avoid unnecessary handling. Interiors shall be kept free from dirt and foreign matter.

PART 2 – PRODUCTS

2.01 General

Specifically construct and install piping systems for the services intended to comply with the design conditions specified or shown in the drawings.

2.02 Water Main Piping

- A. PVC Pipe.
 - 1. Material:
 - a. Polyvinyl Chloride (PVC).
 - b. Standard: ASTM D 1784.
 - c. Type: Cell Classification, 12454-B.
 - 2. Standard:
 - a. Class 150 DR 18, AWWA C 900, pipe size 4-inch through 12-inch diameter.
 - b. Pressure Rated 235 DR 18, AWWA C905, pipe size 14-inch through 24-inch diameter.
 - 3. Joints:
 - a. Standard: ASTM D-1869.
 - b. Type: Integral bell and spigot.
 - c. Flexible seals: Elastomeric, conforming to ASTM F-477.
 - d. Lubricant: As recommended by manufacturer.
 - 4. Restrained Joints
 - a. EBBA Iron, Series 1600
 - b. EBBA Iron, Series 2000PV
 - c. EBBA Iron, Series 2800
 - d. Or Equal
- B. Ductile Iron Pipe.
 - 1. Non-Flanged:
 - a. Standard: AWWA C151 (ANSI A21.51).
 - b. Thickness: Pressure Class 350 (unless otherwise noted).
 - 2. Joints:
 - a. Standard: AWWA C111 (ANSI A21.11).
 - b. Gaskets: Plain Rubber.
 - c. Bolts and Nuts: High Strength low alloy steel.
 - d. Restraint Gasket:
 - (1) Fast Grip by American Cast Iron Pipe Company
 - (2) Field Lock by U.S. Pipe
 - (3) Or equal
 - 3. Coatings and Linings:
 - a. Buried Potable Water Piping
 - (1) Inside Wall of Pipe and Fittings:
 - (a) Standard: AWWA C104 (ANSI A21.4)
 - (b) Cement-Mortar Lining Thickness: Standard
 - (2) Outside Wall of Pipe and Fittings:
 - (a) Coating: Bituminous
 - (b) Thickness: 1 mil approximate
 - b. Surface Preparation: Per coating manufacturer recommendations
 - 4. Restraint Gasket:
 - a. Flex Ring by American Ductile Iron Pipe
 - b. TR Flex by U.S. Pipe
 - c. Or Equal
- C. Fittings:

-
1. Standard: ANSI A21.53/AWWA C153.
 2. Pressure Rating: 350 psi.
 3. Material: Ductile iron.
 4. Gaskets: Plain rubber.
 5. Bolts and Nuts: High strength low alloy steel.
 6. Coatings and Linings:
 - a. Buried Potable Water Piping:
 - (1) Inside Wall of Pipe and Fittings:
 - (a) Standard: AWWA C104 (ANSI A21.4)
 - (b) Cement-Mortar Lining Thickness: Standard
 - (2) Outside Wall of Pipe and Fittings:
 - (a) Coating: Bituminous
 - (b) Thickness: 1 mil approximate
 - b. Surface Preparation: Per coating manufacturer recommendations

- D. Pipe shall be continually marked with manufacturer's name, pipe size, cell classification, DR rating, and ASTM D1784 classification and National Sanitation Foundation Seal (Potable Water Only).

2.03 PE Potable Water (Service Line) Pipe and Appurtenances

- A. Water service tubing shall be polyethylene "PE" tubing having copper tube O.D. sizes and complying with ASTM D2737, NSF approved, dimensions to fit standard CTS fittings, SDR 9, 200 psi.
- B. Corporation stops, curb stops, wye fittings, and other required service fittings shall conform to AWWA C800. All connections to service tubing shall be by approved compression type fitting, with stainless steel tubing inserts as recommended by the fitting manufacturer.

Curb valves shall employ a one-piece integral plug with full-opening port and tee head, turning on a plastic thrust washer at the top and sealed by an "O"-ring. Typically, curb valves shall have a CTS x FIP connection for non-metered services. For any existing, metered connection, Contractor shall supply a curb valve having the appropriate fitting to reconnect to the existing meter. Existing meters shall be kept in service until after short/long service connection is complete. See plans for typical installation of water services. The valve body shall be a one-piece brass casting with closed bottom. The inlet and/or outlet port shall be sealed by a second "O"-ring. The design shall include a locking ring designed to permit locking the valve in the closed position, using a standard padlock.

Service saddles are required for all service line connections and shall be ductile iron or brass with double stainless steel bands. Saddles shall be specifically recommended for use with the type of pipe being connected to.

2.04 Marking Requirements

- A. Intervals: 5 feet maximum.
- B. Designation:
 1. Pipe nominal size.

-
2. Pipe schedule or SDR designation.
 3. Designation "Specification AWWA C 900 or ASTM D-2241."
 4. PVC cell classification.
 5. Manufacturer's name or trade name and code.

C. Location of Pipe Marking:

1. General:
 - a. Each piece of pipe or fitting shall be clearly marked with a designation which shall conform with designations shown on the Shop Drawings.
 - b. Class designation shall be cast or painted on each piece of pipe or fitting four inches in diameter and larger.
 - c. Piping, smaller than 4-inch diameter shall be clearly marked by manufacturer as to material, type and rating.
2. Magnetic Underground Warning Tape:
 - a. The CONTRACTOR shall place magnetic warning tape approximately 12 to 18 inches below grade in all pipe trenches.
 - b. Buried water piping warning tape:
 - (1) Message: "CAUTION - BURIED WATER LINE."
 - (2) Size and Color: 3-inch wide and blue background with black lettering.
3. Tracer Wire
 - a. CONTRACTOR shall place a 14 gauge or heavier (smaller AWG number), solid, insulated, copper wire as indicated in the Contract Drawings.
 - b. The wire must be one continuous, unbroken length and is to be coiled at meters, valves, and bored crossings.

PART 3 – EXECUTION

3.01 Installation

See 33523.10

3.02 Work Affecting Existing Piping

See 33523.10

3.03 Testing of Piping

See 33523.10

3.04 Cleaning and Disinfection

See 33523.10

**** END OF SECTION ****

SECTION 333113
PUBLIC SANITARY UTILITY SEWER PIPING

PART 1 - GENERAL

1.01 Description

- A. Scope:
 - 1. The CONTRACTOR shall furnish all labor, materials, equipment and incidentals as shown, specified and required to install all buried piping, fittings, and specials.
 - 2. The Work includes, but is not limited to, the following:
 - a. All types of buried piping unless specifically included under other Sections.
 - b. Pipe beneath structures.
 - c. Testing and cleaning.
 - d. Installation of all jointing and gasketing materials, specials, couplings, and all other Work required to complete the piping installation.
 - e. All appurtenances and specials shown, specified or required shall be incorporated into the piping systems.
- B. Coordination: Review installation procedures under other Sections and coordinate with the Work that is related to this Section.

1.02 Quality Assurance

Reference Standards: Comply with the latest edition of the following:

- A. ASTM D 1784, Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
- B. ASTM D 3034, Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- C. ASTM F 679, Standard Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings
- D. ASTM F 1803, Standard Specification for Poly (Vinyl Chloride) (PVC) Closed Profile Gravity Pipe and Fittings Based on Controlled Inside Diameter

1.03 Submittals

- A. Shop Drawings: Submit for approval the following:
 - 1. Size, class and other details of pipe to be used.
 - 2. Information on typical joint and harnessing details.
- B. Tests: Submit description of proposed testing methods, procedures and apparatus. Submit copies of all test reports.
- C. Record Drawings: Comply with the general requirements of Section 017839 and the supplemental requirements. During progress of the Work, keep an up to date set of

drawings showing field modifications. Submit drawings at a scale satisfactory to the ENGINEER that show the actual in-place installation of all piping and appurtenances installed under this Section. The drawings shall show all piping on plans with all reference dimensions and elevations required for complete record drawings of the piping systems. The drawings shall be furnished not later than 30 days after Substantial Completion of the Work.

1.04 Product Delivery, Storage and Handling

- A. Delivery, storage and handling of pipe, fittings, and specials shall be in complete compliance with the manufacturer's instructions.
- B. Handle all pipe, fittings and accessories carefully with approved handling devices. Do not drop or roll pipe off trucks. Do not otherwise drop, roll or skid pipe. Materials cracked, gouged, chipped, dented or otherwise damaged will not be approved.
- C. Pipe, fittings and specials shall be unloaded opposite to or as close to the place where they are to be laid as is practicable to avoid unnecessary handling. Interiors shall be kept free from dirt and foreign matter.

PART 2 - PRODUCTS

2.01 General

All pipes shall be furnished by a pipe manufacturer having experience in manufacturing the specific type of pipe in the specific sizes required for use on this project.

2.02 Gravity Sewer Main

- A. PVC Pipe
 - 1. Material:
 - a. Polyvinyl Chloride (PVC).
 - b. Standard: ASTM D 1784.
 - c. Type: Cell Classification as specified in ASTM D 3034, ASTM F 679, or ASTM F 1803.
 - 2. Standard:
 - a. ASTM D 3034, SDR-26, sizes 4 inch through 15 inch diameter (single wall).
 - b. ASTM F 679, PS-115, sizes 18 inch through 36 inch diameter (single wall).
 - c. ASTM F 1803, PS-46 psi, sizes 42 inch through 54 inch diameter (closed profile).
 - 3. Joints:
 - a. Standard: ASTM D 3212.
 - b. Type: Integral bell and spigot.
 - c. Flexible seals: Elastomeric, conforming to ASTM F-477.
 - d. Lubricant: As recommended by manufacturer.
 - e. Gaskets shall be factory applied.
 - 4. Fittings:
 - a. Standard: ASTM D 3034 and F 679 and F 1803.
 - b. Joint Standard: ASTM D 3212.

- c. Schedule: SDR-26, sizes 4 inch through 15 inch diameter
PS-115, sizes 18 inch through 36 inch.
 - 5. Lateral Connectors:
 - a. Lateral connectors can be employed in the connection of service line to sewer trunk line in sizes 24-inch and larger.
 - b. Lateral connectors shall consist of a PVC hub, rubber sleeve, and stainless steel band.
 - c. PVC hub shall meet ASTM D 3034 and be SDR 26 and gasket in hub shall meet ASTM F 477. Rubber sleeve shall meet ASTM C 443. Band and housing shall be type 301 stainless steel and screw shall be type 305 stainless steel.
 - d. Model and Manufacturer:
 - (1) Instera Tee by Inserta Fittings Company.
 - (2) Or equal.
- B. Ductile Iron Pipe
 - 1. Non-Flanged:
 - a. Standard: AWWA C151 (ANSI A21.51).
 - b. Thickness: Class 52.
 - c. Type: Cell Classification as specified in ASTM D 3034, ASTM F 679, or ASTM F 1803.
 - 2. Joints:
 - a. Standard: AWWA C111 (ANSI A21.11).
 - b. Gaskets: Plain Rubber.
 - c. Bolts and Nuts: High Strength low alloy steel.
 - d. Restrained gasket:
 - (1) Fast Grip by American Cast Iron Pipe Company.
 - (2) Field Lock by U.S. Pipe.
 - e. Or Equal.
 - 3. Coating and Linings:
 - a. Inside Wall of DI Pipe and Fittings:
 - (1) Standard: AWWA C104 (ANSI A21.4).
 - (2) Cement Mortar Lining Thickness: Standard.
 - (3) Surface Preparation: Per coating manufacturer recommendations.
 - b. Outside Wall of DI Pipe and Fittings:
 - (1) Coating: Bituminous
 - (2) Thickness: 1 mil approximate.
 - (3) Surface Preparation: Per coating manufacturer recommendations.
 - 4. Fittings:
 - a. Standard: ANSI A21.53/AWWA C153.
 - b. Pressure Rating: 350 psi.
 - c. Material: Ductile Iron.
 - d. Gaskets: Plain Rubber.
 - e. Bolts and Nuts: High strength low alloy steel.
 - 5. Pipe shall be continually marked with manufacturer's name, pipe size, cell classification, DR rating and ASTM D1784 classification and National Sanitation Foundation Seal (Potable Water Only). All pipe shall be manufactured in the United States.

2.03 Sewer and Service Lines Couplings

Flexible Pipe Couplings:

- A. Minimum Wall Thickness: Comply with manufacturer's recommendations for service conditions as shown and specified.
- B. Minimum Length: Comply with manufacturer's recommendations for service conditions as shown and specified.
- C. Materials:
 - 1. Coupling - Elastomeric Polyvinyl Chloride
 - 2. Clamps - Series 300 Stainless Steel Clamps
- D. Size: As needed.
- E. Manufacturer:
 - 1. Fernco #1056 Series
 - 2. Or equal.

2.04 Marking Requirements

- A. Intervals: Five feet maximum.
- B. Designation:
 - 1. Pipe nominal size.
 - 2. Pipe stiffness or SDR designation.
 - 3. Designation "Specification ASTM D 3034 or ASTM F 679 or ASTM F 1803.
 - 4. PVC cell classification.
 - 5. Manufacturer's name or trade name and code.
- C. Pipe Marking:
 - 1. General:
 - a. Each piece of pipe shall be clearly marked with a designation which shall conform with designations shown on the Shop Drawings.
 - b. Class designation shall be cast or painted on each piece of pipe or fitting four inches in diameter and larger.
 - c. Piping, smaller than 4-inch diameter shall be clearly marked by manufacturer as to material, type and rating.
 - 2. Magnetic Underground Warning Tape:
 - a. The CONTRACTOR shall place magnetic warning tape approximately 12 to 18 inches below grade in all pressure pipe trenches.
 - b. Buried gravity sewer pipe main warning tape:
 - (1) Message: "CAUTION - BURIED SEWER LINE."
 - (2) Size and Color: 3-inch wide, green background with black lettering.

PART 3 - EXECUTION

3.01 Installation

A. General:

1. Install piping as shown, specified and as recommended by the manufacturer.
2. Request instructions from the ENGINEER before proceeding if there is a conflict between the manufacturer's recommendations and the Drawings or Specifications.
3. Pipe, fittings and accessories that are cracked, damaged or in poor condition or with damaged linings will be rejected.
4. Minimum cover over piping shall be three (3) feet unless otherwise shown or approved by the ENGINEER.
5. Earthwork required is in Division 31 of these specifications.

B. Bedding Pipe:

1. Select bedding material used around and under flexible pipes shall be as specified in Section 312300, paragraph 2.01 A. Select Backfill Material: Select material for backfilling pipe trenches shall be as specified in Section 312300, Paragraph 2.01 A.
2. Select Bedding and Backfill Installation: All pipe shall be laid on a compacted layer of select bedding or on a flat bottom trench as shown in the Contract Drawings. Promptly after the pipe is laid, pipe embedment will continue in all trenches/excavations and compacted until it covers the pipe at least six inches. Select backfill shall be installed in accordance with Section 312300. The select bedding shall be thoroughly compacted to a density at least equal to 95 percent of the maximum density determined by the Standard Proctor in accordance with ASTM D 698 Method C including Note 2.
3. No piping shall be laid until the ENGINEER approves the bedding condition.
4. No pipe shall be brought into position until the preceding length has been bedded and secured in its final position.
5. All ledge rocks, boulders, and large stones shall be removed during trench excavation to provide a minimum clearance of four to six inches below and a minimum clearance of 12" on each side of pipe.

C. Laying Pipe:

1. Comply with manufacturer's instructions, technical specifications, and details on Contract Drawings.
2. Install all pipe accurately to line and grade shown unless otherwise approved by ENGINEER. Remove and relay pipes that are not laid correctly.
3. Slope piping uniformly between elevations given.
4. Ensure that water level in trench is at least six inches below bottom of pipe. Do not lay pipe in water. Maintain dry trench until jointing and backfilling are complete.
5. Start laying pipe at lowest point and proceed towards the higher elevations, unless otherwise approved by ENGINEER.
6. Place bell and spigot pipe so that bells face the direction of laying, unless otherwise approved by ENGINEER.
7. Excavate around joints in bedding and lay pipe so that only the barrel receives bearing pressure from the trench bottom.
8. Permissible deflections at joints shall not exceed the amount allowed by manufacturer.

9. Take every precaution to ensure that no foreign material enters the piping prior to and during installation.
10. All pipe and fittings shall be carefully examined for cracks, damage, or other defects while suspended above the trench before installation. Defective materials shall be immediately removed from site.
11. Interior of all pipe and fittings shall be inspected and all dirt, gravel, sand, debris or other foreign materials shall be completely removed from the pipe interior before it is moved into the trench.
12. Bell and spigot mating surfaces shall be thoroughly wire brushed and wiped clean and dry immediately before pipe is laid.
13. Every time that pipe laying is not actively in progress, the open ends of pipe shall be closed by a watertight plug.
14. Field cutting pipe, where required, shall be made with a machine specially designed for cutting piping. Cuts shall be carefully done, without damage to pipe or lining, so as to leave a smooth end at right angles to the axis of pipe. Cut ends shall be tapered and sharp edges filed off smooth. Flame cutting will not be allowed.
15. Blocking under piping shall be permitted only when accepted by ENGINEER for special conditions.
16. Touch up protective coatings in a satisfactory manner prior to backfilling.
17. All piping shall be inspected by the ENGINEER prior to any backfilling operations. The CONTRACTOR shall notify the ENGINEER in advance of any backfilling operation.
18. Sewer mains shall be laid at least 10' horizontally and 18" vertically from any water main (water over sewer). Where water lines cross over sewer lines, the pipe segments are to be centered to provide maximum spacing of the joints of both water and sewer lines and a vertical separation of at least 18" (water over sewer) is maintained.
19. In addition to Paragraph 3.01.C.18, the CONTRACTOR shall protect water supplies in accordance with Section 28 of the Department of Environmental Quality guidance.

D. Jointing Pipe:

1. Clean completely all jointing surfaces and adjacent areas immediately before mating joint.
2. Lubricate and adjust gaskets as recommended by manufacturer.
3. After gaskets are compressed and before pipe is brought fully home, each gasket shall be carefully checked for proper position around full circumference of the joint.
4. Conform to manufacturers' recommendations pertaining to jointing pipe.

E. Transitions from One Type of Pipe to Another:

Provide all necessary adapters, specials and connection pieces required when connecting different types and sizes of pipe or when connecting pipe made by different manufacturers.

F. Closures:

1. Provide all closure pieces shown or required to complete the Work.
2. Locate closures in straight runs of pipe.

G. Backfilling:

1. Conform to applicable requirements of the Division 31 Specifications.

2. Backfill by hand and use hand or pneumatic tamping until pipe is covered by at least one foot of backfill.
- H. Movable Sheet piling, Trench Boxes or Shields:
1. When using movable trench support, care should be exercised not to disturb the pipe location, jointing or embedment.
 2. Removal of any trench protection below the top of the pipe is prohibited after the pipe embedment has been compacted.
 3. Movable trench supports shall only be used in either wide trench construction where supports extend below the top of the pipe, or on a shelf above the pipe with the pipe installed in a narrow, vertical-wall subditch.
 4. Any voids left in the embedment material by support removal shall be carefully filled with granular material which is adequately compacted.
 5. Removal of bracing between sheet piling shall only be done where backfilling proceeds and bracing is removed in a manner that does not relax trench support.
 6. When advancing trench boxes or shields, prevent longitudinal pipe movement or disjointing.
 7. In those instances where the trench support must extend to the bottom of the ditch, a subditch is impractical or native soils are unstable, a simple alteration to the commonly used trench box may be the best alternative. A section one-half the length of the box, with a depth of approximately two feet, cut from the bottom of the box will allow the trench shield to ride on the bottom of a narrow trench, while allowing undisturbed pipe embedment in the back half. See Figure 10.20 in Uni-Bell PVC Pipe Association's *Handbook of PVC Pipe - Design and Construction*.

3.02 Work Affecting Existing Piping

- A. Location of Existing Piping:
1. Locations of existing piping shown should be considered approximate.
 2. The CONTRACTOR is responsible for determining exact location of existing piping to which connections are to be made, or which may become disturbed during earth moving operations, or which may be affected by the work in anyway.
 3. Conform to applicable requirements of Section 013515, Cutting and Patching.
- B. Work on Existing Pipelines:
1. Cut pipes as shown or required with machines specifically designed for this work.
 2. Install temporary plugs to keep out all mud, dirt, water and debris.
 3. Provide all necessary adapters, fittings, pipe and appurtenances required.

3.03 Testing of Piping

- A. General:
1. The CONTRACTOR shall conduct deflection tests for all gravity sewer piping.
 2. Notify ENGINEER 48 hours in advance of testing.
 3. Provide all testing apparatus.
 4. Unless otherwise approved, conduct all tests in the presence of the ENGINEER.
- B. Deflection Testing:
1. Gravity sewer pipe will be tested for excessive deflection after installation.
 2. Deflection tests shall be performed on all gravity sewer pipe. The tests shall be conducted after the final backfill has been in place at least 30 days.

3. A "go, no-go" mandrel that is sized such that it will not pass a deflection greater than 5% shall be used.
4. No pipe shall exceed a deflection of 5%.
5. If the deflection test is to be run using a rigid ball or mandrel, it shall have a diameter equal to 95% of the inside diameter of the pipe. The test shall be performed without mechanical pulling devices.
6. The mandrel shall be drawn through the pipe by hand. Irregularities or obstructions encountered in the line shall be corrected by the CONTRACTOR.
7. If a section of pipe with excessive deflection is found, the CONTRACTOR shall uncover the pipe for inspection. Damaged pipe will be replaced. If the pipe is undamaged, the CONTRACTOR may reinstall the bedding and backfill and retest the pipe.

C. Infiltration/Exfiltration Test:

1. The CONTRACTOR shall supply needed equipment and personnel to perform the infiltration/exfiltration test on installed gravity sewer pipe 30 inch and larger.
2. Allowable infiltration/exfiltration shall not exceed 50 gallons per inch of nominal diameter per mile of sewer per day.
3. An exfiltration test shall be performed where the crown of the entire reach of sewer being tested lies less than five feet under the existing water table. Minimum upstream testing head shall be five feet above the existing water table.
4. An infiltration test shall be performed where the crown of the entire reach of sewer being tested lies five feet or more under the existing water table.
5. Sections of installed piping shall be tested from manhole to manhole.
6. The CONTRACTOR shall install a calibrated weir at lower end of section being tested and shall measure leakage for a minimum of four hours if infiltration test is performed. Provide bulkhead at upper end of pipe section being tested.
7. The CONTRACTOR shall measure required water to maintain minimum upstream testing head if exfiltration test is performed.

3.04 Cleaning

- A. All piping shall be thoroughly cleaned and flushed in a manner approved by ENGINEER prior to placing in service. Piping 48 inches diameter and larger shall be inspected from inside and all debris, dirt and foreign matter removed.
- B. Water for flushing and testing shall be furnished and paid for by the CONTRACTOR. The CONTRACTOR shall provide all temporary piping, hose, appurtenances, and services required.

**** END OF SECTION ****