KENTUCKY ENGINEERING GROUP, PLLC

RECEIVED
OCT 20 2009
PUBLIC SERVICE COMMISSION

October 20, 2009

Mr. Jeff R. Derouen
Executive Director
Kentucky Public Service Commission
P.O. Box 615
211 Sower Blvd.
Frankfort, Kentucky 40602

Re: Sandy Hook Water District
Case No. 2009-00401

Dear Mr. Derouen:

Pursuant to your letter dated October 16, 2009 on the above referenced project, I have enclosed the following:

- Two (2) copies of the stamped (signed & dated) plans and specifications for Contract 8 – Water System Improvements, and Contract 9 – Administration Building.
- Ten (10) copies of the plat for the KY 750 Hydropnuematic Pump Station.
- The Sandy Hook Water District is the sole provider of water in Elliott County. The City of Sandy Hook only provides sewer service to its customers.

I have also included other items of documentation that may be beneficial to your review that were not in the original submittal. Please pardon my inadvertent omission of the following:

- Ten (10) copies of the General Assembly House Bill No. 608 – Executed Grant Assistance Agreement. This is the agreement for the 1.1 million granted to the Sandy Hook Water District.
- Ten (10) copies of correspondence from the Sandy Hook Water District with regard to the purchase of the adjoining property needed for the new administration building and shop.
- Ten (10) copies of the correspondence from C & K Contracting, LLC requesting that their low bid on Contract Nine (9) be withdrawn from the project due to a deletion in a line item that was required to get the project within the money available. It must also be noted that this contractor did not have any building experience.

- Ten (10) copies of the correspondence from O'Brien & Gere Engineers, Inc. accepting on behalf of the Sandy Hook Water District, C & K Contracting bid withdrawal request.

Once C & K Contracting had removed itself from the bid review process, O'Brien & Gere negotiated with the second low bidder on Contract 9, Standafer Builders, Inc. Several items were removed from the building contract as stated in the correspondence dated, September 4, 2009 and were included in the original submittal. These items were deleted from the project in order to have the project placed within the project monies available. It must also be stated that Contract 8 required the deletion of three separate water lines and two tank inspections to provide the project with the funds needed. The details of these negotiations with Contract 8 contractor, Southern Backhoe, Inc. were documented in the correspondence dated September 2, 2009 and were part of the original submittal. Both contractors have agreed to the changes, and they will be reflected in a change order for each contract. Please note the lines that were deleted from the contract did not affect new water lines and potential new customers, but those water lines that were going to be **replaced** for various reasons.

Due to the delays caused by the low bidder C & K Contracting on Contract Nine, Sandy Hook Water District has had to request an additional thirty (30) day extension on the bid prices from both Southern Backhoe, Inc. and Standafer Builders, Inc. The new bid hold deadline is November 13, 2009. It would be very much appreciated if your office can expedite this review in order for the contracts to be signed prior to this deadline.

If you have any questions, please contact me at (859) 684-7480 or rsumner@kyengr.com, at your earliest convenience.

Sincerely,

Riley Sumner
Project Manager

C: Ms. Judy Stinson, SHWD
File w/encl.

O'BRIEN & GERE

September 1, 2009

Mr. Paul Caskey
C & K Contracting, LLC
5689 Laurel Creek Road
Vanceburg, Kentucky 41179

Re: Contract 9 – Administration Building
Sandy Hook Water District

Dear Mr. Caskey:

The Sandy Hook Water District has accepted C & K Contracting, LLC's request to withdraw their low bid on the above referenced project per your letter dated August 17, 2009. The Sandy Hook Water District has agreed to return your attached bid bond at no penalty to C & K Contracting, LLC.

If you have any questions, please contact me at your earliest convenience.

Sincerely,

Riley Sumner
Project Associate

C: Ms. Judy Stinson, SHWD
File

C & K CONTRACTING, LLC.
5689 Laurel Creek Road
Vanceburg, Ky 41179
candkcontracting@windstream.net
Phone & Fax: (606)796-2565

August 17, 2009

O'Brien & Greer Engineering
1019 Majestic Drive
Suite 110
Lexington, Ky 40513

Re: Contract 9 – Administration Building
Sandy Hook Water District

Dear Mr. Riley Sumner

Due to the deletion of line item No.4 on the bid forms and unforeseen incidental items that was overlooked prior to the bid opening we do not want to proceed with this project. We are requesting for our bid bond to be returned to us without any penalty. We are truly sorry for any inconvenience.

Thank you,

Paul Caskey

Sandy Hook Water District

P.O. Box 726, Sandy Hook, KY 41171
(606) 738-6282 Fax (606) 738-6292 shwd@mrtc.com

October 19, 2009

Dear Mr. Sumner,

Per your request, the property where the new administration building will be built was bought from Oral & Jessica Moore, July 11, 2009. This property is located between our present office and the main road.

There is no family connection between any board member or employee to the previous owners If there is any other information needed please advise.

Sincerely,

Judy Stinson, Manager

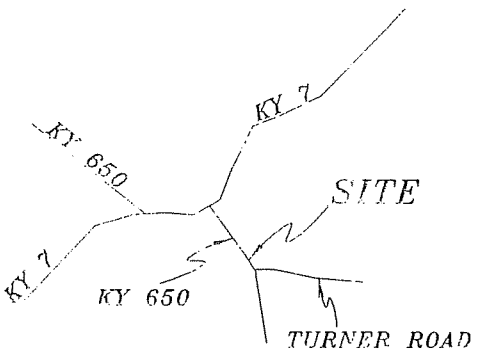
SURVEYORS CERTIFICATE

I HEREBY CERTIFY THAT THIS PLAT DEPICTS A SURVEY, MADE BY ME, BY THE METHOD OF RANDOM TRAVERSE, THE BEARINGS AND DISTANCES SHOWN HEREON HAVE NOT BEEN ADJUSTED FOR CLOSURE. THIS SURVEY AND PLAT MEETS OR EXCEEDS THE MINIMUM STANDARDS OF GOVERNING AUTHORITIES FOR A CLASS "A" SURVEY. CLOSURE = 1:42,749

R. A. Wright — 9-30-08

ROY A. WRIGHT, P.L.S. 2808 — DATE

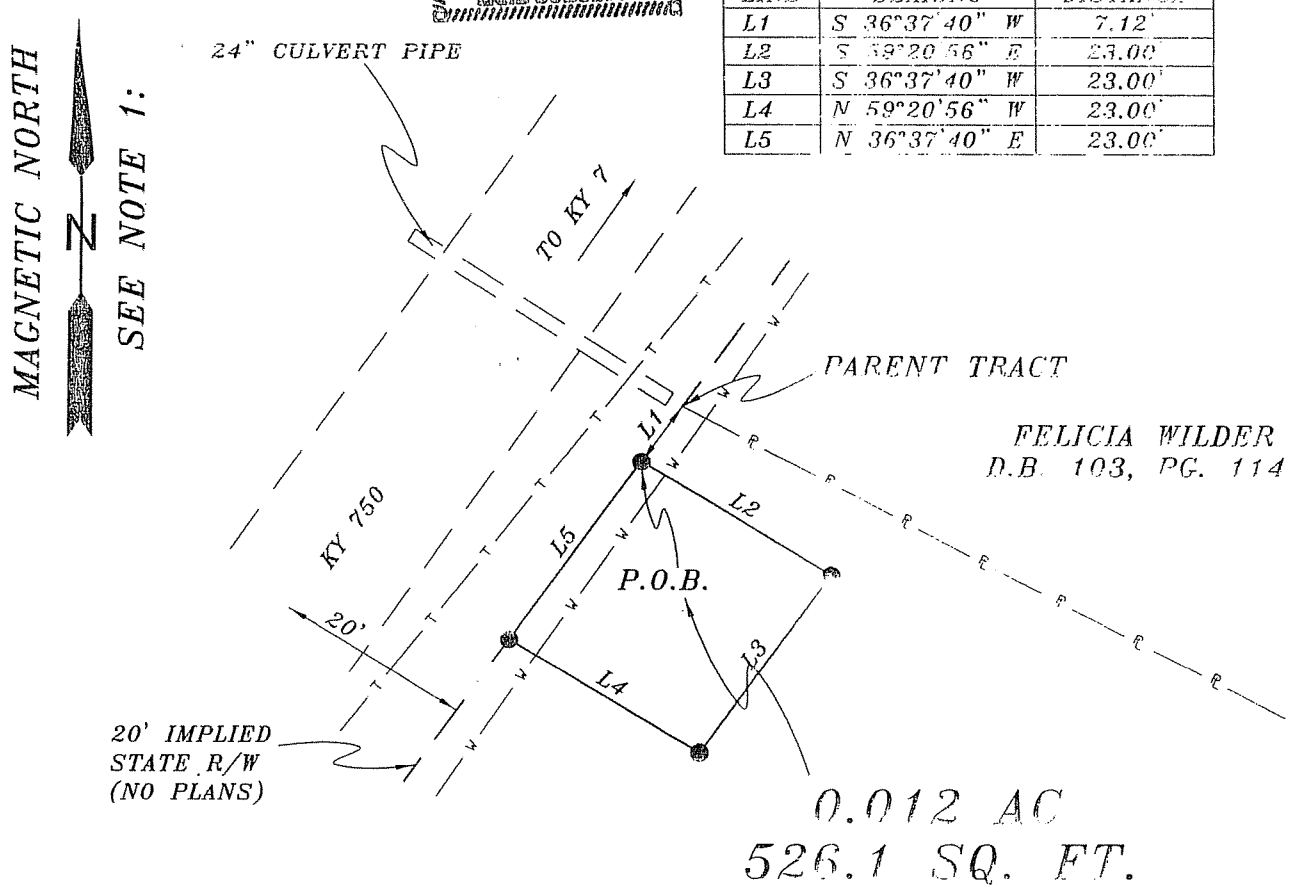
STATE of KENTUCKY
ROY A. WRIGHT
2808
LICENSED
PROFESSIONAL
LAND SURVEYOR



VICINITY MAP

NOT TO SCALE

LINE	BEARING	DISTANCE
L1	S 36°37'40" W	7.12'
L2	S 59°20'56" E	23.00'
L3	S 36°37'40" W	23.00'
L4	N 59°20'56" W	23.00'
L5	N 36°37'40" E	23.00'



0.012 AC
526.1 SQ. FT.

THE 0.012 ACRE TRACT SHOWN HEREON IS A PORTION OF THE SAME PROPERTY CONVEYED TO FELICIA WILDER, SINGLE, APRIL 4, 2006 BY JOHNNY WILDER, SINGLE, AS RECORDED IN DEED BOOK 103, PAGE 118 OF THE ELLIOTT COUNTY CLERKS OFFICE.

FELICIA WILDER
(PORTION REMAINING)
D.B. 103, PG. 118

LEGEND

—— ℄ —— ℄ —— EXISTING PROPERTY LINE

● 1/2" x 18" STEEL RE-BAR (SET THIS SURVEY) WITH ORANGE PLASTIC CAP STAMPED "PROPERTY CORNER, R.A. WRIGHT, P.L.S. 2808"

P.O.B. POINT OF BEGINNING

0' 20' 40' 60'

NOTE 1: THE BEARINGS SHOWN HEREON ARE BASED ON MAGNETIC NORTH AS TAKEN BY MAGNETIC READING ALONG A RANDOM TRAVERSE LINE ON DATE OF SURVEY.

NOTE 2: PROPERTY SHOWN HEREON IS SUBJECT TO ANY AND ALL RECORDED OR UNRECORDED EASEMENTS AND RIGHT OF WAYS, IF ANY, WHETHER SHOWN HEREON OR NOT.

SURVEY DATE 9-26-08

SURVEY OF A PORTION OF

FELICIA WILDER

ELLIOTT COUNTY, KY
KY 650
D.B. 103, PG. 118

SURVEY PERFORMED BY
ROY A. WRIGHT SURVEYING, LLC
P.O. BOX 49, FARMERS, KY 40319

DRAWN RAW	DATE 09/29/08	SURVEY PERFORMED FOR
APPROVED	DATE	SANDY HOOK WATER DISTRICT 100 HOWARDS CREEK ROAD SANDY HOOK, KY 41171
SCALE 1" = 20'	SHEET 1 OF 1	PROJECT NO. SANDY HOOK 08-051

GENERAL ASSEMBLY
COMMONWEALTH OF KENTUCKY

2008 REGULAR SESSION

HOUSE BILL NO. 608

AS ENACTED

TUESDAY, APRIL 15, 2008

VETO MESSAGE FROM THE
GOVERNOR OF THE COMMONWEALTH OF KENTUCKY
REGARDING HOUSE BILL 608 OF THE
2008 REGULAR SESSION

I, Steven L. Beshear, Governor of the Commonwealth of Kentucky, pursuant to the authority granted under Section 88 of the Kentucky State Constitution, do hereby veto the following part:

Page 13, line 3, of House Bill 608: "Waste" and "(SX21177010)".

I am vetoing this part because, according to the Representative and Senator for the district covering Central City, Kentucky, this language was erroneously included in House Bill 608 as a result of a technical drafting error which essentially changed the project from a "water treatment plant expansion" to a "wastewater treatment plant expansion". The Kentucky Infrastructure Authority is being directed to work with the affected community to determine what is needed.

This the 28th day of April, 2008

Steven L. Beshear, Governor

RECEIVED AND FILED
DATE April 28, 2008
10:59 am

TREY GRAYSON
SECRETARY OF STATE
COMMONWEALTH OF KENTUCKY
BY K. Adkins

AN ACT relating to projects and declaring an emergency.

Be it enacted by the General Assembly of the Commonwealth of Kentucky:

➔Section 1. The following Infrastructure for Economic Development Fund for Coal-Producing Counties projects shall be funded from the $75,000,000 Bond Pool authorization identified in Part II, A., 4., 004., of 2008 Regular Session HB 406 as amended by 2008 Regular Session HB 410 and 514:

Fiscal Years	**2008-09**	**2009-10**
Bell County		
001. Bell County Fiscal Court - IP Sewer and Water Infrastructure		
Bond Funds	1,000,000	-0-
002. City of Middlesboro - Noetown Sewer Rehabilitation/Binghamtown Ps Rehabilitation (SX21013148)		
Bond Funds	450,000	-0-
003. Pineville Utility Commission - Rehabilitation - Replacement and/or Extension of Waterlines		
Bond Funds	900,000	-0-
Boyd County		
001. Big Sandy Water District - Fire Hydrant - Purchase and Rehab in Big Sandy and East Fork District Area - Upgrade to Interconnect with City of Ashland		
Bond Funds	200,000	-0-
002. Boyd County Fiscal Court - Phase IV Sewer Infrastructure - Improvements - Marsh Hill Pump Station and Force Main Project and Other Sewer System Upgrades		
Bond Funds	250,000	-0-
003. Boyd County Fiscal Court - Sewer Infrastructure - Improvements - Marsh Hill Pump Station and Force Main Project and Other Sewer System Upgrades		
Bond Funds	750,000	-0-

004.	Boyd County Sanitation District II - Sewer System - Line Extension - Improvements		
	Bond Funds	150,000	-0-
005.	Boyd County Sanitation District II - Sewer System - Line Extension - Improvements		
	Bond Funds	350,000	-0-
006.	Cannonsburg Water District - Water Tank Upgrade/Refurbish and Other Waterline - System Improvements		
	Bond Funds	250,000	-0-
Breathitt County			
001.	Breathitt County Fiscal Court - Hwy 30 West Project		
	Bond Funds	750,000	-0-
002.	Breathitt County Water District - Hwy 15 South (Watts) Extension (WX21025004)		
	Bond Funds	1,600,000	-0-
Carter County			
001.	Carter County Fiscal Court - Rattlesnake Ridge - Water and Sewer Lines		
	Bond Funds	300,000	-0-
002.	City of Grayson - US 60 East to Damron Mayo Subdivision (SX21043005)		
	Bond Funds	550,000	-0-
003.	City of Olive Hill - Blueberry Ridge Road (SX21043010)		
	Bond Funds	450,000	-0-
004.	City of Olive Hill - Facility Plan Update and Feasibility Study to Serve Pleasant Valley (SX21043026)		
	Bond Funds	85,000	-0-
005.	City of Olive Hill - Line Extensions and Upgrades (WX21043025)		
	Bond Funds	415,000	-0-

Clay County

001. City of Manchester - Muddy Gap Sewer Extension

Bond Funds 125,000 -0-

002. City of Manchester - Pennington Hill Tank (WX21051049)

Bond Funds 800,000 -0-

003. City of Manchester - Sewer or Water Plant Expansion (WX21051542)

Bond Funds 500,000 -0-

004. City of Manchester - Water Treatment Plant Expansion Project (WX21051542)

Bond Funds 1,000,000 -0-

005. Clay County Fiscal Court - Countywide Waterline Extensions (WX21051541)

Bond Funds 250,000 -0-

006. Clay County Fiscal Court - Gilberts Creek/Elisha Creek Waterline Extension (WX21051541)

Bond Funds 100,000 -0-

Crittenden County

001. City of Marion - Wastewater Extension Phase I (SX21055002)

Bond Funds 600,000 -0-

002. City of Marion - Water and Sewer Repairs and Extensions

Bond Funds 500,000 -0-

003. City of Marion - Water Distribution Upgrade 2 (WX21055003)

Bond Funds 450,000 -0-

004. Crittenden-Livingston County Water District - Debt Retirement

Bond Funds 300,000 -0-

Daviess County

001. City of Whitesville - Edge Road Waterline Extension (WX21059029)

Bond Funds 12,000 -0-

002.	City of Whitesville - Sewer Rehabilitation (SX21059018)		
	Bond Funds	42,000	-0-
003.	City of Whitesville - Sewer System Upgrade		
	Bond Funds	225,000	-0-
004.	City of Whitesville - Treatment Plant Upgrade (SX21059008)		
	Bond Funds	32,000	-0-
005.	East Daviess County Water Association - Operations Center		
	Bond Funds	225,000	-0-
006.	Owensboro Municipal Utilities - Replace Undersized and Aging Water Mains		
	Bond Funds	225,000	-0-
007.	Regional Water Resource Agency - Subdivision Sewer Extensions		
	Bond Funds	151,000	-0-
008.	Southeast Daviess County Water District - Water Tank Construction Project		
	Bond Funds	225,000	-0-
009.	West Daviess County Water District - Water Tank Construction Project		
	Bond Funds	225,000	-0-
010.	West Daviess County Water District - West Louisville Tank Replacement (WX21059022)		
	Bond Funds	488,000	-0-
Elliott County			
001.	Rattlesnake Ridge Water District - Phase VIII Waterline - Water System - Line Extensions - Upgrades and Other Additions - Enhancements and Upgrades		
	Bond Funds	500,000	-0-
002.	Sandy Hook Sewer District - Sewer System Upgrades - Line Extensions and Maintenance		
	Bond Funds	250,000	-0-

003.	Sandy Hook Water District - Waterline - Water System - Upgrades and Line Extensions - Including GPS Mapping Mandates and Other Capital Improvements		
	Bond Funds	600,000	-0-
004.	Sandy Hook Water District - Waterline - Water System Upgrades and Line Extensions - Including GPS Mapping Mandates and Other Capital Improvements		
	Bond Funds	500,000	-0-
Floyd County			
001.	Floyd County Fiscal Court - Floyd County Fire Hydrants		
	Bond Funds	30,000	-0-
002.	Floyd County Fiscal Court - Floyd County Waterline Replacement - Harold to Little Mud		
	Bond Funds	30,000	-0-
003.	Floyd County Fiscal Court - Harold KY Area - Sewer Plant and Line Expansion		
	Bond Funds	1,000,000	-0-
004.	Floyd County Fiscal Court - Wheelwright Water Plant - Water Source - Water Line Extension		
	Bond Funds	290,000	-0-
005.	Floyd County Fiscal Court - Wheelwright Water Plant - Water Source and Waterline Extensions		
	Bond Funds	310,000	-0-
006.	Wheelwright Utility Commission - Water Treatment Plant Improvements (WX21071903)		
	Bond Funds	860,000	-0-
Hancock County			

Steven L. Beshear
Governor

KENTUCKY INFRASTRUCTURE AUTHORITY
1024 Capital Center Drive, Suite 340
Frankfort, Kentucky 40601
Phone (502) 573-0260
Fax (502) 573-0157
http://kia.ky.gov

John E. Covington III
Executive Director

March 30, 2009

Judy Stinson, Manager
Sandy Hook Water District
1000 Howards Creek Road
Sandy Hook, Kentucky 41171

RE: Infrastructure for Economic Development Fund for Coal Producing Counties
WX21063009 - Sandy Hook Water District – $1,100,000 - HB608 (2008)
Waterline – Water System Upgrades and Line Extensions – Including GPS Mapping Mandates and Other Capital Improvements

Dear Ms. Stinson:

Enclosed please find a copy of the fully executed Grant Assistance Agreement for the above-referenced line item grant.

I have also attached checklists indicating the status of documents submitted to date for the grant agreement. Please review the checklists for items that must be submitted as the project progresses (Steps 2 and 3).

If you have any questions or need further assistance, please contact me.

Sincerely,

Kelli B. Rice

Kelli B. Rice
Kentucky Infrastructure Authority

C: Holly Nicholas, O'brien & Gere, (w/attachments) ✓

3/30/2009

Grantee:	**Sandy Hook Water District**
WRIS:	**WX21063009**
Project ID#:	**39C-2008**
Project Admin:	**Holly Nicholas**
Email:	**nicholhl@obg.com**

Project Amount: 600,000 of **600,000**

CHECKLIST

Step 1, Before Project is Bid:

1- Executed Grant Assistance Agreement	02/27/2009
2- Exhibit 1 - Project Profile and Estimated Project Budget	02/27/2009
3- Exhibit 2 - Resolution	02/04/2009
4- Exhibit 3 - Schedule for Current (and proposed if applicable) Rates and Charges	02/27/2009
5- Clearinghouse State Applicator Identifier # (SAI)	02/27/2009
6- Application for Electronic Transfer of Funds Form	02/04/2009
7- Capital Projects and Bond Oversight Committee Review	03/17/2009

Step 2, After Project is Bid:

1- Exhibit 4 - Revised Project Profile (if applicable) and Project Budget based on Project Bids	
2- Additional Covenants and Agreements (if applicable)	
3- Other Funding Commitment (if applicable)	
4- Documentation of Clearinghouse Endorsement and Comments	03/05/2009

Step 3, Project Closeout:

1- Final Design Plan is an AutoCAD Drawing File Format (DWG), referenced to the appropriate (North and South) Kentucky State Plane Coordinate System (NAD83-Survey Feet) on a Compact Disc (CD) to be submitted within 3 months of initiation of construction.

2- If there is a significant deviation from the Final Design Plan during construction, As-built Plans shall also be provided to the Authority, within three months of construction completion.

3- Exhibit 5 - Fully executed Certificate of Completion

Note: Administrative Fee
Per Section 7 of the Grant Agreement, the Grantee agrees to pay to the Authority a fee equal to 1/2 of 1% of the principal amount of the Grant. The Administrative Fee shall be and payable on the date the Grantee's initial Request for Payment and Project Status Report submitted to the Authority.

3/30/2009

Grantee:	**Sandy Hook Water District**
WRIS:	**WX21063009**
Project ID#:	**40C-2008**
Project Admin:	**Holly Nicholas**
Email:	**nicholhl@obg.com**

Project Amount: 500,000 of **500,000**

CHECKLIST

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KENTUCKY INFRASTRUCTURE AUTHORITY

2008 GENERAL ASSEMBLY
HOUSE BILL 608

GRANT ASSISTANCE AGREEMENT

WRIS NUMBER:	WX21063009
PROJECT ID #:	39C-2008 & 40C-2008
GRANT AMOUNT:	$1,100,000
GRANTEE:	Sandy Hook Water District
DATE OF AGREEMENT:	2/4/09

RECEIVED
KENTUCKY INFRASTRUCTURE
AUTHORITY
2009 FEB 27 A 10: 17

GRANT ASSISTANCE AGREEMENT

This Grant Assistance Agreement ("Agreement") is made and entered into this date, 2-4, 2009 by and between the KENTUCKY INFRASTRUCTURE AUTHORITY ("Authority"), a body corporate and politic, constituting a public corporation and governmental agency and instrumentality of the Commonwealth of Kentucky, and the Sandy Hook Water District.

WITNESS

WHEREAS, the General Assembly of the Commonwealth of Kentucky, at its 1988 Regular Session, amended Chapter 224A of the Kentucky Revised Statutes (the "Act"), creating the "Kentucky Infrastructure Authority" to serve the public purposes identified in the Act; and

WHEREAS, the Authority, an agency of the Commonwealth attached to the Governor's Office, is charged pursuant to KRS 224A.300 with coordinating the implementation of infrastructure projects and to this end maintains within the Water Resource Information System, a comprehensive database of profiles of each community's water and wastewater projects; and

WHEREAS, the 2008-1010 Budget enacted by the 2008 General Assembly included funding for the Infrastructure for Economic Development Fund – Non-Coal Counties and the Infrastructure for Economic Development Fund – Coal Counties and charged the Authority with administrating the program;

WHEREAS, THE 2008 General Assembly included in the Commonwealth's 2008-2010 biennial Budget funding for the Grantee's Infrastructure project, the subject of this Agreement; and

WHEREAS, the Grantee now seeks to implement the Project as identified in the 2008-2010 Budget of the Commonwealth and the Authority has determined that the Project is a Project within the meaning of the Act, and has been shown to be consistent with the Area Water Management Plan where applicable; and

WHEREAS, the Grantee and the Authority desire to enter into this Agreement which sets forth their respective duties, rights, covenants, and obligations with respect to the acquisition, construction and financing of the Project described in the Grantee's Project Profile.

NOW THEREFORE, in consideration of the mutual covenants and conditions contained herein and for the other good and valuable consideration, the receipt, mutuality and sufficiency of all of which is hereby acknowledged by the parties hereto, the Authority and the Grantee each agree as follows:

SECTION 1 – DEFINITIONS

All terms utilized herein shall have the same definitions and meaning as ascribed to them in the Act, which are hereby incorporated in this Agreement by reference, the same as if set forth hereby verbatim; provided, however, that those definitions utilized in the Act having general application are hereby modified in certain instances to apply specifically to the Grantee and its Project.

Act shall mean Chapter 224A of the Kentucky Revised Statutes, as amended.

Agreement shall mean this Agreement made and entered into by and between the Grantee and the Authority, as authorized by the Act, providing for a Grant to the governmental agency, unit of government, or private, investor-owned water system by the Authority.

Area Water Management Council shall mean the council designated as the planning body for the area, which shall prepare the Area Water Management Plan and approve all Project Profiles for water and wastewater projects.

Area Water Management Plan shall mean the plan that identifies current and future water supply, drinking water, and wastewater service needs of the area.

Authority shall mean the Kentucky Infrastructure Authority created by the Act as amended, a body corporate and politic, constituting a public corporation and a governmental agency and instrumentality of the Commonwealth of Kentucky, or such other designation as may be effected by future amendments to the Act.

Engineer(s) shall mean the professional engineer or firm of professional engineers properly procured by the Grantee in connection with the Project identified in the Project Profile Database.

Grantee shall mean the Sandy Hook Water District or their designee that is a governmental agency or unit of government or any private, investor owned utility within the Commonwealth eligible for funding under the Program in accordance with the Act, now having been or hereafter being granted the authority and power to finance, acquire, construct, or operate a Project, and for the purposes of this Agreement shall mean that Sandy Hook Water District identified in the Project Profile or the 2008 Budget of the Commonwealth.

Grant shall mean the funds effected under this Agreement from the Authority to the Grantee in the principal amount set forth in the 2008-20010 Budget of the Commonwealth, for the purpose of defraying the costs incidental to the Project.

Kentucky Water Management Plan shall mean the guide and strategy that incorporates and analyzes each Area Water Management Plan and provides an assessment of future needs and allocation of funding for water and wastewater services throughout the Commonwealth.

Program shall mean the program authorized by KRS 224A.035 for the Authority to engage in a program of assistance to designated entities with respect to the construction and acquisition of water and wastewater infrastructure projects.

Project shall mean, when used generally, water, wastewater or other infrastructure project authorized pursuant to the Act, and when used in specific reference to the Grantee, the Project described in the Project Profile.

Project Administrator shall mean that individual designated in writing to the Authority by the Grantee, who has the responsibility of supervising the Project and coordinating the preparation of all documentation with respect to the Project.

Project Budget shall mean a list of Project expenses and funding sources, in the form set forth in **Exhibit 1**.

Project Profile shall mean those specific details of the Project, approved by the Area Water Management Council as being consistent with the Area Water Management Plan, as applicable.

Rates and Charges shall mean an approved schedule of charges, based on actual cost of service, to adequately provide for retirement of any related debt obligation and to provide for proper operation of the Project.

System shall mean the utility system owned and operated by the Grantee of which the Project shall become a part and from the earnings of which System shall be operated, maintained and insured.

SECTION 2 - OBLIGATIONS OF THE AUTHORITY

The Authority covenants and agrees, conditioned upon the timely performance by the other party of its respective obligations, to undertake the following obligations:

A. The Authority shall pay to the Grantee the grant sum in an amount not to exceed $1,100,000 subject to the availability of appropriate funding, to complete the Project in accordance with the Project Profile attached hereto as Exhibit 1, which is hereby incorporated herein and made a part of this Agreement. No payments shall be made until after the Project has received Clearinghouse endorsement.

B. The Authority may make periodic reviews of the Project progress and may make inspections of the Project and send inspection reports to the Grantee. Deficiencies identified in the inspection report shall be corrected by the Grantee and the correction reported in writing to the Authority within two weeks of receipt of the Authority's inspection report.

C. The Authority shall cooperate with the Grantee in order to facilitate the obligations set out in this Agreement.

SECTION 3 - OBLIGATIONS OF THE GRANTEE

The Grantee covenants and agrees to undertake the following obligations:

A. The Grantee shall, before any funds are released, sign and submit the Agreement, and complete and include the following Exhibits which are incorporated herein and made a part hereof:

1. **Before the Project is bid**, the Grantee shall complete and submit to the Authority the following:

   a) A Project description in the form of a Project Profile together with the estimated Project Budget, as **Exhibit 1**.

   b) Original copy of the Grantee's resolution, as **Exhibit 2**, accepting the grant award, amending its budget to allow for receipt and expenditures of these funds, and authorizing a designated individual to execute the Agreement and all other documentation related to the Project.

   c) A schedule of current rates and charges, as **Exhibit 3**. If there will be a change in the current rate structure as a result of this project, provide the proposed schedule of rates and charges.

   d) Documentation of Clearinghouse Endorsement.

   e) An Application for Electronic Transfer of Funds, as **Attachment B**.

   f) Any additional covenants or agreements that may be required.

2. **After Project is bid**, the Grantee shall complete and submit to the Authority the following:

   a) A revised Project Budget based on Project bids, as **Exhibit 4**.

   b) Documentation of Clearinghouse Comments.

The Grantee may request receipt of Grant funds after completion of items of Exhibits 1-4 by executing a Request for Payment and Project Status Report, as provided by the Authority, and attaching appropriate documentation, concluding, but not limited to, invoices and receipts. The Authority may withhold release of funds until receipt of Administrative Fee pursuant to Section 7.

B. The Grantee agrees to adopt and use the Kentucky Uniform System of Accounting and Cost-Based Rates (KUSoA) and assure that rates and charges for service are based upon the cost of providing such service. If applicable to the Project. These rates and charges shall be in place no later than within 12 months of the end of the Grantee's current fiscal year.

C. The Grantee shall receive Project funds via Electronic Fund Transfer (EFT) with the EFT to be implemented by use of the form provided by the Authority.

D. The Grantee shall perform and/or cause to be performed all necessary acts (consistent with KRS 45A and in accordance with applicable laws) to plan, design and construct the Project including: the procurement of land, easements and rights of way; professional services, including but not limited to architectural and engineering services; construction contractor(s); and equipment and/or materials.

E. The Grantee shall obtain all necessary permits, licenses and approvals from the appropriate federal, state, and/or local governmental entities prior to construction of the Project. Further, the Grantee shall require all construction contractors to pay wages pursuant to applicable prevailing wage rates (federal or state) for all work relating to the subject Project.

F. The Grantee shall utilize the "Fees for Professional Engineering Services – Percentage of Construction Cost", in the engineer's contract for this project, as provided by the Authority.

G. The Grantee shall comply with all applicable federal and state statutes, executive orders, regulatory requirements, and policies relating to the planning and construction of the Project.

H. The Grantee shall provide to the Authority access to all records related to the Project for review in determining compliance with the Grant Agreement and all applicable laws and regulations. The Grantee shall retain all records, including all invoices, relating to the Project for three years after full execution of **Exhibit 5** - Certificate of Completion.

I. The Grantee shall cooperate fully with the Authority and provide any documentation requested by the Authority in order to facilitate the obligations set out in this Agreement.

J. Any unauthorized or improper expenditure of funds, or expenditure of funds other than in accordance with the terms of this Agreement, shall be deemed a default of this Agreement by the Grantee.

K. The Grantee will proceed expeditiously with and complete the Project in accordance with the approved final design, plans and specifications or amendments thereto, prepared by the Project Engineer for the Grantee and as approved by the appropriate state and federal agencies.

L. The Grantee agrees that throughout the reasonable life of the infrastructure facilities developed under this Project it will retain ownership of, operate, and maintain these facilities, and all appurtenances thereto, keeping them in good and sound repair and good operating condition at its own expense so that the completed Project will continue to provide the services for which it was designed. Change of ownership or disposal of the Project facilities may occur only with written approval of the Authority.

M. The Grantee agrees that it will at all times impose, charge and collect sufficient customer Rates and Charges.

N. The Grantee shall, within 3 months of initiation of construction of the Project, submit to the Authority, Final Design Plans in an AutoCAD Drawing File Format (DWG), referenced to the appropriate (North or South) Kentucky State Plane Coordinate System (NAD83-Survey Feet) on a Compact Disc (CD). If there is a significant deviation from the Final Design Plan during construction, As-built plans shall also be provided to the Authority, within three months of construction completion, in the same format.

O. The Grantee shall submit the fully executed Certificate of Completion once all Project construction related activities are complete. **Exhibit 5**.

SECTION 4 - MUTUALITY OF OBLIGATIONS

A. The parties agree that the funds granted by the Commonwealth to the Grantee are to be used solely for the purposes of implementing the Project. Further the parties agree that the obligations imposed upon them are for their respective benefit and the timely fulfillment of each and every obligation in accordance with this Agreement is necessary. The failure of either party to fulfill its obligations under this Agreement shall constitute a breach of same.

B. In the event of default by the Grantee, including the failure to take actions directed herein and/or to comply with time deadlines set out in this Agreement, the Authority may declare this Agreement void from the beginning without further obligation to the Grantee and may commence appropriate legal action to enforce its rights under this Agreement including action for recovery of funds expended hereunder.

C. Except as may otherwise be provided herein, the parties to this Agreement shall be solely responsible for any costs incurred in fulfilling their respective obligations under this Agreement and neither party shall have any claim against the other party for reimbursement of costs whether or not a party is in default.

SECTION 5 - TERMS OF AGREEMENT

A. All funds made available under this Agreement are subject to reauthorization by subsequent General Assemblies of the Commonwealth of Kentucky. Should funding for the Project not be reauthorized this agreement shall terminate.

B. This Agreement shall be valid only after all signatories have signed.

C. This Agreement may be terminated by either party at any time for cause and may be terminated by either party without cause upon 30 days written notice to the other party. Termination of this Agreement shall not diminish or in any other manner affect any other remedy that may be available to the parties for any breach of the Agreement that occurs prior to the termination.

D. If additional financial assistance for this project becomes available to the Grantee after execution of this agreement, the amount of the assistance from the Authority shall be recalculated with the inclusion of the additional assistance, and the Grantee shall pay to the Authority the amount, if any, by which the grant actually made, exceeds the grant as determined by the recalculation.

SECTION 6 - ADVANCE FUNDING FOR PROJECT PLANNING AND DESIGN

A. The Grantee may request, in writing, that a portion of the grant funds be disbursed prior to Project bidding to pay a portion of the cost of Project planning and design directly related to

submission of the Project plans and specifications for review by the Division of Water and the Public Service Commission, as may be required.

B. It is specifically understood and agreed by the Grantee, in the event that the Project has not commenced construction by June 30, 2010, for whatever reason, all grant funds disbursed for Project planning and design are subject to full and immediate repayment to the Authority.

C. Funds disbursed under this Section of the Agreement shall not exceed 50% of the Project planning and design amount.

D. Funds received under provisions of this Section shall be used solely for planning and design costs of the Project.

E. No funds shall be released under this Section until the requirements of Section 3. A. 1. of this Agreement have been met.

SECTION 7 - ADMINISTRATIVE FEE

The Grantee agrees to pay to the Authority an administrative fee (the "Administrative Fee") equal to ½ of 1% of the principal amount of the Grant. The Administrative Fee shall be due and payable on the date the Grantee's initial Request for Payment and Project Status Report is submitted to the Authority. Administrative fees are applicable for Grantees identified under the Sections of the 2008-20010 Budget of the Commonwealth as Coal Producing Counties and Non-Coal Producing Counties only.

SECTION 8 - MISCELLANEOUS PROVISIONS

A. This Agreement may be signed by each party on a separate copy, and in such case one counterpart of this Agreement shall consist of a sufficient number of such copies to reflect the signature of each party hereto. This Agreement may be executed in two or more counterparts each of that shall be deemed an original, and it shall not be necessary in making proof of this Agreement or the terms and conditions hereof to produce or account for more than one of such counterparts.

B. The headings set forth in this Agreement are only for convenience or reference and the words contained therein shall in no way be held to explain, modify, amplify or aid in the interpretation, construction or meaning of the provisions of this Agreement.

C. The terms and conditions of this Agreement shall be binding upon and shall inure to the benefit of the successor and assigns, respectively, of the parties. This provision shall not be construed to permit an assignment by any party of any of its rights and duties under this Agreement which assignment shall be prohibited except with the prior written consent of the parties hereto.

D. This Agreement sets forth the entire understanding of the parties with respect to the subject matter hereof, and may be modified only by a written instrument duly executed by each of the parties hereto.

E. The parties agree that any suit, action or proceeding with respect to this Agreement may only be brought into or entered by, as the case may be, the courts of the Commonwealth of Kentucky situated in Frankfort, Franklin County, Kentucky or the United States District Court for the Eastern District of Kentucky, Frankfort Division.

F. The Authority may audit or review all documentation and records of the Grantee relating to this Project pursuant to the provisions of KRS 45A.150.

G. The Grantee agrees that the Authority, the Finance and Administration Cabinet, the Auditor of Public Accounts, and the Legislative Research Commission, or their duly authorized representatives, shall have access to any books, documents, papers, records, or other evidence, which are directly pertinent to this contract for the purpose of financial audit or program review. Furthermore, any books, documents, papers records, or other evidence provided to the Commonwealth, the Finance and Administration Cabinet, the Auditor of Public Accounts, or the Legislative Research Commission which are directly pertinent to the contract shall be subject to public disclosure regardless of the proprietary nature of the information, unless specific information is identified and exempted and agreed to by the Secretary of the Finance and Administration Cabinet as meeting the provisions of KRS 61.878(1)(c) prior to the execution of the contract. The Secretary of the Finance and Administration Cabinet shall not restrict the public release of any information which would otherwise be subject to public release if a state government agency was providing the services.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their respective duly authorized officers as of the day and year above written.

KENTUCKY INFRASTRUCTURE AUTHORITY

By: _____

Title: Executive Director

ATTEST

By: _____

Title: Secretary

SANDY HOOK WATER DISTRICT

By: _____

Title: Chairman

ATTEST

By: _____

Title: Manager

EXAMINED

LEGAL COUNSEL TO THE
KENTUCKY INFRASTRUCTURE AUTHORITY

By: _____ 31709

KENTUCKY INFRASTRUCTURE AUTHORITY
1024 Capital Center Drive, Suite 340
Frankfort, Kentucky 40601
Phone (502) 573-0260
Fax (502) 573-0157
http://kia.ky.gov

Steven L. Beshear
Governor

John E. Covington III
Executive Director

March 30, 2009

Judy Stinson, Manager
Sandy Hook Water District
1000 Howards Creek Road
Sandy Hook, Kentucky 41171

RE: Infrastructure for Economic Development Fund for Coal Producing Counties
WX21063009 - Sandy Hook Water District – $1,100,000 - HB608 (2008)
Waterline – Water System Upgrades and Line Extensions – Including GPS Mapping Mandates and Other Capital Improvements

Dear Ms. Stinson:

Enclosed please find a copy of the fully executed Grant Assistance Agreement for the above-referenced line item grant.

I have also attached checklists indicating the status of documents submitted to date for the grant agreement. Please review the checklists for items that must be submitted as the project progresses (Steps 2 and 3).

If you have any questions or need further assistance, please contact me.

Sincerely,

Kelli B. Rice

Kelli B. Rice
Kentucky Infrastructure Authority

C: Holly Nicholas, O'brien & Gere, (w/attachments) ✓

3/30/2009

Grantee:	**Sandy Hook Water District**
WRIS:	**WX21063009**
Project ID#:	**39C-2008**
Project Admin:	**Holly Nicholas**
Email:	**nicholhl@obg.com**

Project Amount: 600,000 of **600,000**

CHECKLIST

Step 1, Before Project is Bid:

1- Executed Grant Assistance Agreement	02/27/2009
2- Exhibit 1 - Project Profile and Estimated Project Budget	02/27/2009
3- Exhibit 2 - Resolution	02/04/2009
4- Exhibit 3 - Schedule for Current (and proposed if applicable) Rates and Charges	02/27/2009
5- Clearinghouse State Applicator Identifier # (SAI)	02/27/2009
6- Application for Electronic Transfer of Funds Form	02/04/2009
7- Capital Projects and Bond Oversight Committee Review	03/17/2009

Step 2, After Project is Bid:

1- Exhibit 4 - Revised Project Profile (if applicable) and Project Budget based on Project Bids	
2- Additional Covenants and Agreements (if applicable)	
3- Other Funding Commitment (if applicable)	
4- Documentation of Clearinghouse Endorsement and Comments	03/05/2009

Step 3, Project Closeout:

1- Final Design Plan is an AutoCAD Drawing File Format (DWG), referenced to the appropriate (North and South) Kentucky State Plane Coordinate System (NAD83-Survey Feet) on a Compact Disc (CD) to be submitted within 3 months of initiation of construction.

2- If there is a significant deviation from the Final Design Plan during construction, As-built Plans shall also be provided to the Authority, within three months of construction completion.

3- Exhibit 5 - Fully executed Certificate of Completion

Note: Administrative Fee
Per Section 7 of the Grant Agreement, the Grantee agrees to pay to the Authority a fee equal to 1/2 of 1% of the principal amount of the Grant. The Administrative Fee shall be and payable on the date the Grantee's initial Request for Payment and Project Status Report submitted to the Authority

3/30/2009

Grantee:	**Sandy Hook Water District**
WRIS:	**WX21063009**
Project ID#:	**40C-2008**
Project Admin:	**Holly Nicholas**
Email:	**nicholhl@obg.com**

Project Amount: 500,000 of **500,000**

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KENTUCKY INFRASTRUCTURE AUTHORITY

2008 GENERAL ASSEMBLY
HOUSE BILL 608

GRANT ASSISTANCE AGREEMENT

WRIS NUMBER:	WX21063009
PROJECT ID #:	39C-2008 & 40C-2008
GRANT AMOUNT:	$1,100,000
GRANTEE:	Sandy Hook Water District
DATE OF AGREEMENT:	2/4/09

RECEIVED
KENTUCKY INFRASTRUCTURE
AUTHORITY
2009 FEB 27 A 10: 17

GRANT ASSISTANCE AGREEMENT

This Grant Assistance Agreement ("Agreement") is made and entered into this date, 2-4, 2009 by and between the KENTUCKY INFRASTRUCTURE AUTHORITY ("Authority"), a body corporate and politic, constituting a public corporation and governmental agency and instrumentality of the Commonwealth of Kentucky, and the Sandy Hook Water District.

WITNESS

WHEREAS, the General Assembly of the Commonwealth of Kentucky, at its 1988 Regular Session, amended Chapter 224A of the Kentucky Revised Statutes (the "Act"), creating the "Kentucky Infrastructure Authority" to serve the public purposes identified in the Act; and

WHEREAS, the Authority, an agency of the Commonwealth attached to the Governor's Office, is charged pursuant to KRS 224A.300 with coordinating the implementation of infrastructure projects and to this end maintains within the Water Resource Information System, a comprehensive database of profiles of each community's water and wastewater projects; and

WHEREAS, the 2008-1010 Budget enacted by the 2008 General Assembly included funding for the Infrastructure for Economic Development Fund – Non-Coal Counties and the Infrastructure for Economic Development Fund – Coal Counties and charged the Authority with administrating the program;

WHEREAS, THE 2008 General Assembly included in the Commonwealth's 2008-2010 biennial Budget funding for the Grantee's Infrastructure project, the subject of this Agreement; and

WHEREAS, the Grantee now seeks to implement the Project as identified in the 2008-2010 Budget of the Commonwealth and the Authority has determined that the Project is a Project within the meaning of the Act, and has been shown to be consistent with the Area Water Management Plan where applicable; and

WHEREAS, the Grantee and the Authority desire to enter into this Agreement which sets forth their respective duties, rights, covenants, and obligations with respect to the acquisition, construction and financing of the Project described in the Grantee's Project Profile.

NOW THEREFORE, in consideration of the mutual covenants and conditions contained herein and for the other good and valuable consideration, the receipt, mutuality and sufficiency of all of which is hereby acknowledged by the parties hereto, the Authority and the Grantee each agree as follows:

SECTION 1 – DEFINITIONS

All terms utilized herein shall have the same definitions and meaning as ascribed to them in the Act, which are hereby incorporated in this Agreement by reference, the same as if set forth hereby verbatim; provided, however, that those definitions utilized in the Act having general application are hereby modified in certain instances to apply specifically to the Grantee and its Project.

Act shall mean Chapter 224A of the Kentucky Revised Statutes, as amended.

Agreement shall mean this Agreement made and entered into by and between the Grantee and the Authority, as authorized by the Act, providing for a Grant to the governmental agency, unit of government, or private, investor-owned water system by the Authority.

Area Water Management Council shall mean the council designated as the planning body for the area, which shall prepare the Area Water Management Plan and approve all Project Profiles for water and wastewater projects.

Area Water Management Plan shall mean the plan that identifies current and future water supply, drinking water, and wastewater service needs of the area.

Authority shall mean the Kentucky Infrastructure Authority created by the Act as amended, a body corporate and politic, constituting a public corporation and a governmental agency and instrumentality of the Commonwealth of Kentucky, or such other designation as may be effected by future amendments to the Act.

Engineer(s) shall mean the professional engineer or firm of professional engineers properly procured by the Grantee in connection with the Project identified in the Project Profile Database.

Grantee shall mean the Sandy Hook Water District or their designee that is a governmental agency or unit of government or any private, investor owned utility within the Commonwealth eligible for funding under the Program in accordance with the Act, now having been or hereafter being granted the authority and power to finance, acquire, construct, or operate a Project, and for the purposes of this Agreement shall mean that Sandy Hook Water District identified in the Project Profile or the 2008 Budget of the Commonwealth.

Grant shall mean the funds effected under this Agreement from the Authority to the Grantee in the principal amount set forth in the 2008-20010 Budget of the Commonwealth, for the purpose of defraying the costs incidental to the Project.

Kentucky Water Management Plan shall mean the guide and strategy that incorporates and analyzes each Area Water Management Plan and provides an assessment of future needs and allocation of funding for water and wastewater services throughout the Commonwealth.

Program shall mean the program authorized by KRS 224A.035 for the Authority to engage in a program of assistance to designated entities with respect to the construction and acquisition of water and wastewater infrastructure projects.

Project shall mean, when used generally, water, wastewater or other infrastructure project authorized pursuant to the Act, and when used in specific reference to the Grantee, the Project described in the Project Profile.

Project Administrator shall mean that individual designated in writing to the Authority by the Grantee, who has the responsibility of supervising the Project and coordinating the preparation of all documentation with respect to the Project.

Project Budget shall mean a list of Project expenses and funding sources, in the form set forth in **Exhibit 1**.

Project Profile shall mean those specific details of the Project, approved by the Area Water Management Council as being consistent with the Area Water Management Plan, as applicable.

Rates and Charges shall mean an approved schedule of charges, based on actual cost of service, to adequately provide for retirement of any related debt obligation and to provide for proper operation of the Project.

System shall mean the utility system owned and operated by the Grantee of which the Project shall become a part and from the earnings of which System shall be operated, maintained and insured.

SECTION 2 - OBLIGATIONS OF THE AUTHORITY

The Authority covenants and agrees, conditioned upon the timely performance by the other party of its respective obligations, to undertake the following obligations:

A. The Authority shall pay to the Grantee the grant sum in an amount not to exceed $1,100,000 subject to the availability of appropriate funding, to complete the Project in accordance with the Project Profile attached hereto as Exhibit 1, which is hereby incorporated herein and made a part of this Agreement. No payments shall be made until after the Project has received Clearinghouse endorsement.

B. The Authority may make periodic reviews of the Project progress and may make inspections of the Project and send inspection reports to the Grantee. Deficiencies identified in the inspection report shall be corrected by the Grantee and the correction reported in writing to the Authority within two weeks of receipt of the Authority's inspection report.

C. The Authority shall cooperate with the Grantee in order to facilitate the obligations set out in this Agreement.

SECTION 3 - OBLIGATIONS OF THE GRANTEE

The Grantee covenants and agrees to undertake the following obligations:

A. The Grantee shall, before any funds are released, sign and submit the Agreement, and complete and include the following Exhibits which are incorporated herein and made a part hereof:

1. **Before the Project is bid**, the Grantee shall complete and submit to the Authority the following:

   a) A Project description in the form of a Project Profile together with the estimated Project Budget, as **Exhibit 1**.

   b) Original copy of the Grantee's resolution, as **Exhibit 2**, accepting the grant award, amending its budget to allow for receipt and expenditures of these funds, and authorizing a designated individual to execute the Agreement and all other documentation related to the Project.

   c) A schedule of current rates and charges, as **Exhibit 3**. If there will be a change in the current rate structure as a result of this project, provide the proposed schedule of rates and charges.

   d) Documentation of Clearinghouse Endorsement.

   e) An Application for Electronic Transfer of Funds, as **Attachment B**.

   f) Any additional covenants or agreements that may be required.

2. **After Project is bid**, the Grantee shall complete and submit to the Authority the following:

   a) A revised Project Budget based on Project bids, as **Exhibit 4**.

   b) Documentation of Clearinghouse Comments.

The Grantee may request receipt of Grant funds after completion of items of Exhibits 1-4 by executing a Request for Payment and Project Status Report, as provided by the Authority, and attaching appropriate documentation, concluding, but not limited to, invoices and receipts. The Authority may withhold release of funds until receipt of Administrative Fee pursuant to Section 7.

B. The Grantee agrees to adopt and use the Kentucky Uniform System of Accounting and Cost-Based Rates (KUSoA) and assure that rates and charges for service are based upon the cost of providing such service. If applicable to the Project. These rates and charges shall be in place no later than within 12 months of the end of the Grantee's current fiscal year.

C. The Grantee shall receive Project funds via Electronic Fund Transfer (EFT) with the EFT to be implemented by use of the form provided by the Authority.

D. The Grantee shall perform and/or cause to be performed all necessary acts (consistent with KRS 45A and in accordance with applicable laws) to plan, design and construct the Project including: the procurement of land, easements and rights of way; professional services, including but not limited to architectural and engineering services; construction contractor(s); and equipment and/or materials.

E. The Grantee shall obtain all necessary permits, licenses and approvals from the appropriate federal, state, and/or local governmental entities prior to construction of the Project. Further, the Grantee shall require all construction contractors to pay wages pursuant to applicable prevailing wage rates (federal or state) for all work relating to the subject Project.

F. The Grantee shall utilize the "Fees for Professional Engineering Services – Percentage of Construction Cost", in the engineer's contract for this project, as provided by the Authority.

G. The Grantee shall comply with all applicable federal and state statutes, executive orders, regulatory requirements, and policies relating to the planning and construction of the Project.

H. The Grantee shall provide to the Authority access to all records related to the Project for review in determining compliance with the Grant Agreement and all applicable laws and regulations. The Grantee shall retain all records, including all invoices, relating to the Project for three years after full execution of **Exhibit 5** - Certificate of Completion.

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J. Any unauthorized or improper expenditure of funds, or expenditure of funds other than in accordance with the terms of this Agreement, shall be deemed a default of this Agreement by the Grantee.

K. The Grantee will proceed expeditiously with and complete the Project in accordance with the approved final design, plans and specifications or amendments thereto, prepared by the Project Engineer for the Grantee and as approved by the appropriate state and federal agencies.

L. The Grantee agrees that throughout the reasonable life of the infrastructure facilities developed under this Project it will retain ownership of, operate, and maintain these facilities, and all appurtenances thereto, keeping them in good and sound repair and good operating condition at its own expense so that the completed Project will continue to provide the services for which it was designed. Change of ownership or disposal of the Project facilities may occur only with written approval of the Authority.

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N. The Grantee shall, within 3 months of initiation of construction of the Project, submit to the Authority, Final Design Plans in an AutoCAD Drawing File Format (DWG), referenced to the appropriate (North or South) Kentucky State Plane Coordinate System (NAD83-Survey Feet) on a Compact Disc (CD). If there is a significant deviation from the Final Design Plan during construction, As-built plans shall also be provided to the Authority, within three months of construction completion, in the same format.

O. The Grantee shall submit the fully executed Certificate of Completion once all Project construction related activities are complete. **Exhibit 5**.

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A. The parties agree that the funds granted by the Commonwealth to the Grantee are to be used solely for the purposes of implementing the Project. Further the parties agree that the obligations imposed upon them are for their respective benefit and the timely fulfillment of each and every obligation in accordance with this Agreement is necessary. The failure of either party to fulfill its obligations under this Agreement shall constitute a breach of same.

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A. All funds made available under this Agreement are subject to reauthorization by subsequent General Assemblies of the Commonwealth of Kentucky. Should funding for the Project not be reauthorized this agreement shall terminate.

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C. This Agreement may be terminated by either party at any time for cause and may be terminated by either party without cause upon 30 days written notice to the other party. Termination of this Agreement shall not diminish or in any other manner affect any other remedy that may be available to the parties for any breach of the Agreement that occurs prior to the termination.

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B. It is specifically understood and agreed by the Grantee, in the event that the Project has not commenced construction by June 30, 2010, for whatever reason, all grant funds disbursed for Project planning and design are subject to full and immediate repayment to the Authority.

C. Funds disbursed under this Section of the Agreement shall not exceed 50% of the Project planning and design amount.

D. Funds received under provisions of this Section shall be used solely for planning and design costs of the Project.

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The Grantee agrees to pay to the Authority an administrative fee (the "Administrative Fee") equal to ½ of 1% of the principal amount of the Grant. The Administrative Fee shall be due and payable on the date the Grantee's initial Request for Payment and Project Status Report is submitted to the Authority. Administrative fees are applicable for Grantees identified under the Sections of the 2008-20010 Budget of the Commonwealth as Coal Producing Counties and Non-Coal Producing Counties only.

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E. The parties agree that any suit, action or proceeding with respect to this Agreement may only be brought into or entered by, as the case may be, the courts of the Commonwealth of Kentucky situated in Frankfort, Franklin County, Kentucky or the United States District Court for the Eastern District of Kentucky, Frankfort Division.

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By: _____

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ATTEST

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SANDY HOOK WATER DISTRICT

By: _____

Title: Chairman

ATTEST

By: _____

Title: Manager

EXAMINED

LEGAL COUNSEL TO THE
KENTUCKY INFRASTRUCTURE AUTHORITY

By: _____ 31709

2009-00401

CONTRACT DOCUMENTS
and
SPECIFICATIONS

RECEIVED
OCT 20 2009
PUBLIC SERVICE
COMMISSION

CONTRACT NO. 8

2008 Water System Improvements

Sandy Hook Water District
Sandy Hook, Kentucky

April, 2009
O'Brien & Gere Project No. 43011

O'Brien & Gere Engineers, Inc.
1019 Majestic Drive, Suite 110
Lexington, Kentucky 40513
(859) 223-0137

O'BRIEN & GERE

Set #7
Digital Planroom
www.lynnimaging.com

CONTRACT DOCUMENTS
and
SPECIFICATIONS

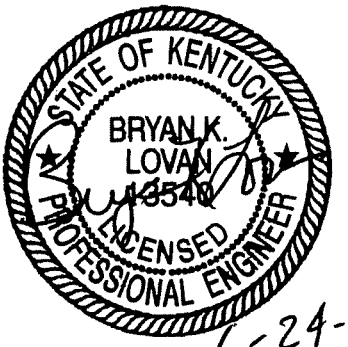
CONTRACT NO. 8

2008 Water System Improvements

Sandy Hook Water District
Sandy Hook, Kentucky

April, 2009
O'Brien & Gere Project No. 43011

O'Brien & Gere Engineers, Inc.
1019 Majestic Drive, Suite 110
Lexington, Kentucky 40513
(859) 223-0137



6-24-09

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O'BRIEN & GERE

ADDENDUM NO. 1

SANDY HOOK WATER DISTRICT
CONTRACT NO. 8
2008 WATER SYSTEM IMPROVEMENTS

BID DATE: Thursday, July 23, 2009 at 11 AM (local time)

This Addendum No.1 and its noted revisions and attachments to the Drawings and/or Specifications shall supplement, amend, and become a part of the Bidding Documents, Drawings, and Specifications. All Bids and Construction Contracts shall be based on these modifications.

REPLACEMENT - SPECIFICATIONS

SECTION 00300 BID FORMS – Replace the original bid schedule with the **revised** attached schedule.

ADDITION - SPECIFICATIONS

SECTION 10012 - TANK INSPECTIONS

PART 1 – GENERAL
1.01 WORK INCLUDED – **Add** the following sentence, "Tank inspection may be performed by diver or a remotely controlled submergible robot."

SECTION 15240 – ABOVE GROUND PACKAGED BOOSTER PUMP STATION

PART 1 – GENERAL – **Add** the following sentence to paragraph 2, " Syncroflo Pump Stations have been approved as an alternate manufacturer.

SECTION 00300

BID FORMS

PART 1 - BIDDER'S PROPOSAL FORM

BIDDER'S PROPOSAL
SANDY HOOK WATER DISTRICT
CONTRACT NO. 8 - 2008 WATER SYSTEM IMPROVEMENTS

Proposal of _____ (hereinafter called "BIDDER"), organized and existing under the laws of the State of _____, doing business as _____ (insert "a corporation", "a partnership", or "an individual" as applicable). Sandy Hook Water District (hereinafter called "OWNER").

In compliance with the Advertisement for Bids, BIDDER hereby proposes to furnish all equipment, materials and labor for the work required to construct **Contract No. 8- 2008 Water System Improvements, Sandy Hook Water District, Sandy Hook**, Kentucky in strict accordance with the Contract Documents, within the time set forth therein, and at the price stated below.

BID SCHEDULE

ITEM NO.	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL BID AMOUNT
1	200	LF	**2-inch Water Main,** PVC Pipe, Class 200 (ASTM D2241) SDR 21 with all appurtenances and fittings		
2	2800	LF	**3-inch Water Main,** PVC Pipe, Class 250 (ASTM D2241) SDR 17 with all appurtenances and fittings.		
3	7900	LF	**3-inch Water Main**, PVC Pipe, Class 200 (ASTM D2241) SDR 21 with all appurtenances and fittings.		
4	1100	LF	**4-inch Water Main,** PVC Pipe Class 200 (ASTM D2241) SDR 21 with all appurtenances and fittings.		
5	1400	LF	~~**4" Water Main,** PVC Pipe, Class 250 (ASTM 224X) SDR 17 with all~~ appurtenances and fittings.		
6	800	LF	~~**6-inch Water Main,** PVC Pipe Class~~ 200 C-900 (ASTM D2241) with all appurtenances and fittings		
7	1	EA	**2-inch** C.I. AWWA N.R.S. Gate Valve and Valve Box. Complete in Place.		

ITEM NO.	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL BID AMOUNT
8	4	EA	**3-inch** C.I.AWWA N.R.S. Gate Valve and Valve Box. Complete In Place.		
9	1	EA	4-inch C.I.AWWA N.R.S. Gate Valve and Valve Box. Complete In Place.		
10	6	EA	Tapping Sleeve & Valve. Complete in Place. (3", 4", 6")		
11	4	EA	Tie Into Existing Water Main.		
12	8	EA	Replace existing meter settings w/new meter setting, meters, and reconnect to existing services.		
13	10	EA	Set new meter setting, meters, and appurtenances on new water mains.		
14	26	EA	Reconnect existing meter services to new water main		
15	25	EA	5/8" x 3/4" Resetter with Ind. Pressure Reducing Valve and Existing Meter		
16	800	LF	Additional 1" Polyethelene Tubing, CL. 250		
17	85	LF	12" Steel Casing Bored and Jacked		
18	275	LF	PVC Open Cut Casing		
19	1	LF	PRV Replacement in Existing Line w/new setter and prv		
20	240	LF	Type C Creek Crossing		

ITEM NO.	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL BID AMOUNT
21	9	LF	Blow Off Assembly (Various Sizes)		
22	2	LF	Flushing Hydrant Assembly (4" & 6")		
23	7	EA	Cut and Plug Existing Water Main		
24	1	LS	Hydropnuematic Pump Station, Electric, and Appurtenances. Complete in Place.		
25	4	EA	Tie-in to Existing Blow Off Assembly		
26	1	EA	3/4" Air Release Valve		
27	1	LS	Partial Fencing and Site Work of Cemetery Tank Site		
28	1	LS	Fencing and Site Work of Dehart Pump Station		
29	1	LS	Fencing and Site Work of Town Tank Site		
30	1	LS	Inspection and Site Work of Wrigley Tank		
31	1	LS	Inspection of Cemetery Tank		
32	60	LF	Driveway Bores w/PVC Casing		

TOTAL AMOUNT BID - (ABOVE ITEMS): _____ Dollars and

_____ (Cents) (_____).

The above prices shall include all labor, materials, overhead, profit, insurance and other costs necessary to cover the finished work of the several kinds called for. The price per foot for pipe installation includes all labor, materials, unclassified excavation, rock blasting and removal, clean-up, etc. for a finished product. Changes in the work shall be processed in accordance with the General Provisions.

By submission of this Bid, the BIDDER certifies, and in the case of a joint Bid each party thereto certifies as to its own organization, that this Bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this Bid, with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence work under this Contract on or before a date to be specified in the Notice to Proceed and to fully complete the project within **Ninety (90)** consecutive calendar days and an additional 90 calendar days for the pump station only. BIDDER further agrees to pay as liquidated damages, the sum of $ 300.00 for each consecutive calendar day thereafter as provided in the General Provisions.

Accompanying this Proposal is a certified check or standard Bid Bond in the sum of _____(Dollars) ($_____) in accordance with the Instructions to Bidders. The BIDDER, by submittal of this Bid, agrees with the OWNER that the amount of the bid security deposited with this Bid fairly and reasonably represents the amount of damages the OWNER will suffer due to the failure of the BIDDER to fulfill his agreements as provided in this Proposal.

BIDDER acknowledges receipt of the following Addenda:

_____

_____

BIDDER agrees that the OWNER reserves the right to delete the whole or any part of the Project from the Contract.

BIDDER understands that the OWNER reserves the right to reject any or all Bids and to waive any informalities in the Bidding.

BIDDER agrees that this Bid shall be good and may not be withdrawn for a period of ninety (90) calendar days after the actual date of bid opening.

BIDDER agrees to perform all of the Work described in the Specifications and shown on the Plans for the amount stated above. Within ten (10) calendar days after receiving written notice of the acceptance of this Bid by the OWNER, the BIDDER will execute and deliver to the OWNER ten (10) copies of the Agreement and such other required Contract Documents.

BIDDER:

_____

By_____

Title_____

Address _____

(Seal - If bid is by a corporation)

_____

Date Signed_____

END OF SECTION

INFORMATION FOR BIDDERS

ADVERTISEMENT FOR BIDS

Sealed bids for Contract 8 - Water System Improvements and Contract 9 – Administration Building for the Sandy Hook Water District, Sandy Hook, Kentucky, will be received at the Sandy Hook Water District Office, 1000 Howards Creek Road, Sandy Hook, Kentucky, 41171 until 11 a.m., Local Time, Thursday, July 23, 2009 and then publicly opened and read aloud.

Contract No.8- The program of work for which bids are to be submitted consists of approximately 16,000 LF of pipe, and a pre-fabricated hydropnuematic pump station including all related appurtenances as described in the specifications and plans.

The contract time allotted for the completion of this contract is one hundred and eighty consecutive calendar days for the pump station only, and ninety (90) consecutive calendar days for all other items in the contract.

Contract No. 9 – The program of work for which bids are to be submitted consists of a new office building, paving, site work, electrical, plumbing and all related appurtenances as described in the specifications and plans.

The contract time allotted for the completion of this contract is two hundred and forty calendar days.

The work is located in Elliott County, Kentucky: Drawings, Specifications and Contract Documents may be examined at:

O'BRIEN & GERE ENGINEERS, INC. 1019 Majestic Dr., Suite 110, Lexington Kentucky 40513
Phone: (859) 223-0137

SANDY HOOK WATER DISTRICT 1000 Howards Creek Road, Sandy Hook, Kentucky 41171

AGC/McGraw Hill, 950 Contract St. Suite 100, Lexington, KY 40505

Reed Construction Data, 30 Technology Parkway South, Ste. 500, Norcross, GA 30092

Builders Exchange, 2300 Meadow Drive, Louisville, KY 40213

Copies of the Specifications, Plans, and Contract Documents may be obtained from Lynn Imaging., 328 Vine Street, Lexington, Kentucky 40507, Phone (859) 255-1021, upon receipt of a non-refundable amount of $150.00. for contract 8 and $200 for contract 9.

State Wage Rates apply for both projects

Hearing impaired individuals may call 1-800-247-2510 for information.

No Bidder may withdraw his Bid within ninety (90) days after the actual date of bid opening.

Bidders on this work will be required to comply with Title VI of the Civil Rights Act of 1964, the Anti-Kickback Act, and the Contract Work Hours Standard Act.

Bidders must comply with the President's Executive Orders No. 11246 and No. 11375 and any amendments or

supplements to those Executive Orders.

Attention of bidders is particularly called to the requirements as to conditions of employment to be observed under the contract, Section 3, Segregated Facility, Section 109 and E.O. 11246.

Bidders must certify they do not and will not maintain or provide for their employees any facilities that are segregated or based on race, color, creed, or national origin.

Minorities and small businesses are encouraged to submit bids on this project.

The Sandy Hook Water District reserves the right to waive any bidding informalities and to reject any or all bids.

Qualified bidders must be registered plan holders.

The sealed bid for these projects shall be clearly marked on the outside of the envelope: Sealed Bid for Contract No.8 - *2008 Water System Improvements or sealed bid for Contract 9 – Administration Building for the Sandy Hook Water* District. The bids may be mailed to: Sandy Hook Water District, P.O. Box 726, Sandy Hook, Kentucky 41171.

Sandy Hook Water District
Barry Blair, Chairman

INFORMATION FOR BIDDERS

SECTION 2

INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL INSTRUCTIONS AND INFORMATION

1.01 Each Bidder is responsible for inspecting the work site and for being thoroughly familiar with the Contract Documents, including Addenda. The Bidder shall in no way be relieved from any bidding obligation because of unfamiliarity with the site or documents. Neither the Owner nor Engineer assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

1.02 All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply throughout the Contract and they will be deemed to be included in the Contract the same as though herein written out in full.

1.03 The Owner of the Project is The Sandy Hook Water District.

1.04 The Engineer of the Project is O'Brien & Gere Engineers, Inc., 1019 Majestic Drive, Suite 110, Lexington, Kentucky 40513, Phone 859-223-0137, Mr. Riley Sumner, Project Manager.

1.05 The Contract Documents contain the provisions for construction of the Project. Information obtained from an officer, agent, or employee of the Owner, or from any other person, shall not affect the risk or obligation assumed by the Contractor or relieves the Contractor from fulfilling any of the conditions of the Contract.

1.06 The Owner may make such investigations as deemed 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 an investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Agreement and to complete the Work.

PART 2 - SPECIAL INSTRUCTIONS AND INFORMATION

2.01 The Contract will be awarded based on the lowest responsible bid.

PART 3 - BIDDING PROCEDURE

3.01 Bids will be received by The Sandy Hook Water District. until 11:00 A.M. (local time) Thursday, July 23, 2009, and then publicly opened and read aloud at said office.

3.02 Each Bid must be submitted in a sealed envelope, addressed to The Sandy Hook Water District, Sandy Hook Kentucky. The bid may be mailed to: Sandy Hook Water District, P.O. 726 Sandy Hook, Kentucky 41171 . Each envelope containing a Bid must be plainly marked on the outside as "Sealed Bid for Contract No. 8– 2008 Water System Improvements for The Sandy Hook Water District," and the envelope shall bear on the outside the Bidder's name, address and license number, if applicable, and date and time of opening. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed to The Sandy Hook Water District, P.O. Box 726 Sandy Hook, Kentucky 41171.

3.03 All Bids must be made on the required bid form. All blank spaces for Bid prices must be filled in, in ink or typewritten, and the Bid form must be fully completed and executed when submitted. Each bid must be submitted on the prescribed form and accompanied by the required certificates. All foregoing certifications must be fully completed and executed when submitted.

3.04 Each Bid must be accompanied by a separate Bid Bond for the Contract payable to the Owner for five (5) percent of the total amount of the Bid on the Contract. As soon as the Bid prices are compared, the Owner will return the Bonds of all except the three lowest responsible Bidders. When the Agreements are executed, the Bonds of the two remaining unsuccessful Bidders will be returned. The Bid Bonds of the successful Bidder will be retained until the Payment Bonds and Performance Bonds have been executed and approved, after which it will be returned. Certified checks payable to the Owner, equal to five (5) percent of the Bids, may be substituted for the Bid Bonds.

3.05 **All bids must be made on the required Bid Form and must be fully completed and executed with original signatures and corporate seals. All Bid Bonds must be original forms and accompanied by the required certificates, original signatures and seals. Any Bids without original documents or a conditional or qualified Bid will not be accepted.**

3.06 A Bid may be withdrawn prior to the scheduled time for the opening of Bids, or authorized postponement thereof. A Bid received after the time and date specified will not be considered. No Bidder may withdraw a Bid within ninety (90) days after the actual date of the opening. Should the Contract not be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the Bidder.

3.07 The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof. The Owner may waive any bidding informalities or minor defects or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered.

3.08 A conditional or qualified Bid will not be accepted.

3.09 The Bidder shall supply the names and addresses of major suppliers and subcontractors as part of the Bid Proposal.

3.10 The quantities listed in the Bid Schedule are estimates only. Final payment will be based on unit prices and actual or plan quantities of work performed.

3.11 The Owner reserves the right to add, delete or change any part or portion of the proposed work. Any changes made by the Owner that affect the work will be compensated for.

3.12 Any bidder may modify his/her bid by telegraphic communication at any time prior to the scheduled closing time for receipt of bids, provided such telegraphic communication is received by the Owner prior to the closing time, and provided further, the Owner is satisfied that a written confirmation of the telegraphic modification over the signature of the bidder was mailed prior to the closing time. The telegraphic communication should not reveal the bid price but should provide the addition or subtraction or other modification so that the final prices or terms will not be known by the Owner until the bid is opened. If written confirmation is not received within two days from the closing time, no consideration will be given to the telegraphic modification.

3.13 The successful bidder, upon failure or refusal to execute and deliver the contract and bonds required within 10 days after receiving notice of the acceptance of their bid, shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited (Bid Bond) with the bid.

3.14 Each bidder must inform themselves 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/her obligation to furnish all material and labor necessary to carry out the provisions of the contract. Insofar as possible, the contractor, in carrying out the work, must employ such methods or means as will not cause any interruption of or interference with the work of any other Contractor.

3.15 No interpretation of the meaning of the plans, specifications or other pre-bid documents will be made to any bidder orally.

Every request for such interpretation should be in writing addressed to Mr. Riley Sumner, O'Brien & Gere Engineers, Inc., 1019 Majestic Drive, Lexington, Kentucky 40513, Phone 859-223-0137, and to be given consideration

must be received at least five days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if used, will be mailed to all prospective bidders (at the respective addresses furnished for such purposes), not later than three days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his/her bid as submitted. All addenda so issued shall become part of the contract documents.

3.16 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 of his/her bid.

PART 4 - AWARD OF CONTRACT (AGREEMENT)

4.01 Award of Contract will be made to the lowest responsible Bidder for the Contract unless all Bids are rejected. The Owner reserves the right to reject any and all bids, to waive any bidding informalities, and to disregard all nonconforming, non-responsive or conditional bids. Discrepancies between words and figures will be resolved in favor of words. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

4.02 The Bidder to whom the Contract is awarded will be required to execute the Agreement and obtain the Performance Bond and Payment Bond within ten (10) calendar days from the date of the Notice of Award. The Notice of Award will be accompanied by the necessary Agreement and Bond forms. In case of failure of the Bidder to execute the Agreement, the Owner may consider the Bidder in default, in which case the Bid Bond accompanying the proposal shall become the property of the Owner.

4.03 A Performance Bond and a Payment Bond each in the amount of 100 percent (100%) of the Contract Price, with a corporate surety approved by the Owner, will be required for the faithful performance of the Contract. Such Bonds shall not be dated with a date earlier than the date of Agreement for the Contract (Project) being bonded.

4.04 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.

4.05 The Owner within ten (10) calendar days of receipt of acceptable Performance Bond, Payment Bond and Agreement signed by the Bidder to whom the Agreement was awarded, shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the Owner not execute the Agreement within such period, the Bidder may, by written notice, withdraw the signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the Owner.

4.06 The Notice to Proceed shall be issued by the Owner within ten (10) calendar days of the execution of the Agreement by the Owner. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the Owner and Contractor. If the Notice to Proceed has not been issued within the specified periods or the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party.

- END OF SECTION -

INFORMATION FOR BIDDERS

SECTION 3

BIDDING PROVISIONS

PART 1 - HOURS AND WAGES

1.01 No laborer, workman or mechanic in the employ of the Contractor, Subcontractor or other person doing or contracting to do the whole or part of the work contemplated by this Contract shall be permitted or required to work more than eight hours in any one calendar day or more than five days in any one week except in cases of extraordinary emergency, including fire, flood or danger to life or property.

1.02 Each laborer, workman or mechanic employed by the Contractor, Subcontractor or other person about or upon the work under this contract shall be paid no less than the prevailing rate of wages and shall be provided the supplements not less than the prevailing supplements as determined by the Fiscal Officer pursuant to Article 8 of the Labor Law. The prevailing rate schedule as determined by the Fiscal Officer follows this section and is a part of this Contract. Wage rates redetermined in accordance with the law will be transmitted, when received, to the Contractor and will become a part of this Contract at no cost to the Owner. Any person employed on the site of the work in an occupation not listed in the following prevailing rate schedule shall be paid not less than the minimum rate per hour and shall be provided not less than the supplements designated by the Fiscal Officer.

PART 2. DISCRIMINATION PROHIBITED

The Contractor agrees, in accordance with the applicable provisions of the Labor Law of the State of Kentucky:

2.01 That in the hiring of employees for the performance of work under this Contract or any subcontract hereunder, no Contractor, Subcontractor nor any person acting on behalf of such Contractor or Subcontractor, shall by reason of race, creed, color, national origin, or sex discriminate against any citizen of the State of Kentucky who is qualified and available to perform the work to which the employment relates;

2.02 That no Contractor, Subcontractor, nor any person on his behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under this Contract on account of race, creed, color, national origin, or sex;

2.03 That this Contract may be canceled or terminated by the Owner and all monies due or to become due hereunder may be forfeited, for a second or any subsequent violation of the terms or conditions of this section of the Contract;

2.04 The aforesaid provisions of this section covering every contract for or on behalf of the State or a municipality for the manufacture, sale or distribution of materials, equipment or supplies shall be limited to operations performed within the territorial limits of the State of Kentucky.

PART 3 - WORKER'S COMPENSATION

3.01 This Contract shall be void and of no effect unless the person or corporation making or performing such contract shall secure compensation for the benefit of, and keep insured during the life of such contract, such employees, in compliance with the provisions of the worker's compensation law.

PART 4 - LIEN LAW

4.01 The attention of the Contractor is invited to the provisions of the Lien Law of the State of Kentucky, wherein funds received by a contractor for a public improvement are declared to constitute trust funds in the hands of such contractor to be applied first to the payment of certain claims.

Steven L. Beshear
Governor

Daniel Mongiardo
Lieutenant Governor

KENTUCKY LABOR CABINET
DEPARTMENT OF WORKPLACE STANDARDS
DIVISION OF EMPLOYMENT STANDARDS,
APPRENTICESHIP & MEDIATION
1047 US Hwy 127 S - Suite 4
Frankfort, Kentucky 40601
Phone: (502) 564-3534
Fax (502) 564-2248
www.labor.ky.gov

J. R. Gray
Secretary

Mark S. Brown
Deputy Secretary

Michael L. Dixon
Commissioner

June 16, 2009

Riley Sumner
O'Brien & Gere
1019 Majestic Drive Ste 100
Lexington KY 40513

Re: Sandy Hook Water District, Contract 8-2008 Water System Improvements

Advertising Date as Shown on Notification: June 24, 2009

Dear Riley Sumner:

This office is in receipt of your written notification on the above project as required by KRS 337.510 (1).

I am enclosing a copy of the current prevailing wage determination number CR 4-28, dated January 5, 2009 for ELLIOTT County. This schedule of wages shall be attached to and made a part of the specifications for the work, printed on the bidding blanks, and made a part of the contract for the construction of the public works between the public authority and the successful bidder or bidders.

The determination number assigned to this project is based upon the advertising date contained in your notification. There may be modifications to this wage determination prior to the advertising date indicated. In addition, if the contract is not awarded within 90 days of this advertising date or if the advertising date is modified, a different set of prevailing rates of wages may be applicable. It will be the responsibility of the public authority to contact this office and verify the correct schedule of the prevailing rates of wages for use on the project. Your project number is as follows: 032-H-00035-09-4, Heavy/Highway

Sincerely,

Michael L. Dixon
Commissioner

ERRATUM

Refer to the Locality Number and Determination Number listed below published by the Kentucky Labor Cabinet, Division of Employment Standards, Apprenticeship and Mediation on January 5, 2009.

Locality Number 028 – Elliott, Fleming, Lawrence and Rowan counties

Determination Number CR-4-028

DELETE:

PLUMBERS/PIPEFITTERS:	BASE RATE	$25.70
	FRINGE BENEFITS	$17.48

INSERT:

PLUMBERS/PIPEFITTERS	BASE RATE	$25.70
	FRINGE BENEFITS	$17.91

Michael L. Dixon

Michael L. Dixon, Commissioner
Department of Workplace Standards
Kentucky Labor Cabinet
Frankfort KY 40601

This 21st day of January, 2009

KENTUCKY LABOR CABINET
PREVAILING WAGE DETERMINATION
CURRENT REVISION
LOCALITY NO. 028

Determination No. CR-4-028

Date of Determination: January 5, 2009

PROJECT #032-H-00035-09-4

_____BLDG _xx____H/H

This schedule of the prevailing rate of wages for Locality No. 028, which includes Elliott, Fleming, Lawrence and Rowan Counties, has been determined in accordance with the provisions of KRS 337.505 to 337.550. This determination shall be referred to as Prevailing Wage Determination No. CR-4-028.

Apprentices shall be permitted to work as such subject to Administrative Regulations adopted by the Executive Director of the Office of Workplace Standards. Copies of these regulations will be furnished upon request to any interested person.

Overtime is to be computed at not less than one and one-half (1 1/2) times the indicated BASE RATE for all hours worked in excess of eight (8) per day, and/or in excess of forty (40) per week. However, KRS 337.540 permits an employee and employer to agree, in writing, that the employee will be compensated at a straight time base rate for hours worked in excess of eight (8) hours in any one calendar day, but not more than ten (10) hours worked in any one calendar day, if such written agreement is prior to the over eight (8) hours in a calendar day actually being worked, or where provided for in a collective bargaining agreement. The fringe benefit rate is to be paid for each hour worked at a straight time rate for all hours worked. Fringe benefit amounts are applicable for all hours worked except when otherwise noted. Welders will receive rate for craft in which welding is incidental.

No laborer, workman or mechanic shall be paid at a rate less than that of the General Laborer except those classified as bona fide apprentices registered with the Kentucky State Apprenticeship Supervisor unless otherwise specified in this schedule of wage rates.

NOTE: The type of construction shall be determined by applying the following definitions.

BUILDING CONSTRUCTION

Building construction is the construction of sheltered enclosures with walk-in access for the purpose of housing persons, machinery, equipment, or supplies. It includes all construction of such structures, the installation of utilities and the installation of equipment, both above and below grade level, as well as incidental grading, utilities and paving.

CR-4-028
January 5, 2009

HIGHWAY CONSTRUCTION

Highway construction includes the construction, alteration or repair of roads, streets, highways, runways, taxiways, alleys, trails, paths, parking areas, and other similar projects not incidental to building or heavy construction. It includes all incidental construction in conjunction with the highway construction project.

HEAVY CONSTRUCTION

Heavy projects are those projects that are not properly classified as either "building" or "highway". For example, dredging projects, water and sewer line projects, dams, flood control projects, sewage treatment plants and facilities, and water treatment plants and facilities are considered heavy.

Michael L. Dixon
COMMISSIONER
KENTUCKY LABOR CABINET

CLASSIFICATIONS		RATE AND FRINGE BENEFITS	
ASBESTOS/INSULATION WORKERS: (Mechanical only)		BASE RATE FRINGE BENEFITS	$28.83 15.53
BOILERMAKERS:		BASE RATE FRINGE BENEFITS	$28.70 15.74
BRICKLAYERS:			
Bricklayers:		BASE RATE FRINGE BENEFITS	$25.49 14.33
Sawmen, power tools, and swing/scaffold:		BASE RATE FRINGE BENEFITS	$27.18 14.33
Carbon or acid brick:		BASE RATE FRINGE BENEFITS	$26.40 14.33
Hot pay and gunnite:		BASE RATE FRINGE BENEFITS	$27.23 14.33
CARPENTERS:			
Carpenters:	BUILDING	BASE RATE FRINGE BENEFITS	$19.46 12.47
Piledrivermen:	BUILDING	BASE RATE FRINGE BENEFITS	$19.86 12.47
Carpenters:	HEAVY & HIGHWAY	BASE RATE FRINGE BENEFITS	$18.35 5.80
Piledrivermen:	HEAVY & HIGHWAY	BASE RATE FRINGE BENEFITS	$18.00 5.80
Divers:	HEAVY & HIGHWAY	BASE RATE FRINGE BENEFITS	$30.30 5.43

CLASSIFICATIONS	RATE AND FRINGE BENEFITS	
CEMENT MASONS:	BASE RATE	$ 22.84
	FRINGE BENEFITS	6.22

First 10 to 50 feet - .25 pr hour above base rate, .01 per foot for every additional foot above 50 feet. This shall include Swing Suspended Scaffolds or chairs and all other high and hazardous work. Working ten (10) feet below ground level or more shall receive .25 above base rate scale for hazardous work.

ELECTRICIANS:	BASE RATE	$29.32
	FRINGE BENEFITS	17.93

Cable splicers, specialized welders, and men working 30 – 100 feet with no floor level (excluding pole or tower work done by linemen, and a scaffold originating from floor level which complies with appropriate State Code) shall be paid 5% above BASE RATE. Men working 100 feet and over shall receive double workmens rate of pay.

ELEVATOR CONSTRUCTORS:	BASE RATE	$28.25
	FRINGE BENEFITS	5.19

ELLIOTT & LAWRENCE COUNTIES:

GLAZIERS:	BASE RATE	$19.96
	FRINGE BENEFITS	1.40

FLEMING COUNTY:

GLAZIERS:	BASE RATE	$15.45

ROWAN COUNTY:

GLAZIERS:	BASE RATE	$9.05

IRONWORKERS:	BASE RATE	$26.87
	FRINGE BENEFITS	16.09

CLASSIFICATIONS		RATE AND FRINGE BENEFITS	
LABORERS:			
BUILDING GROUP 1: Laborers, carpenter tenders, cement finisher helpers, concrete men, wreckers, handling of empty oxygen and acetylene bottles, environmental laborers, hole watch and fire watch:	BUILDING	BASE RATE FRINGE BENEFITS	$23.22 10.70
BUILDING GROUP 2: Deck & scow men:	BUILDING	BASE RATE FRINGE BENEFITS	$23.32 10.70
BUILDING GROUP 3: Hod Carriers & mortar men, later & plaster helpers:	BUILDING	BASE RATE FRINGE BENEFITS	$23.37 10.70
BUILDING GROUP 4: Wrapping, heating & applying hot & cold tar on all pipes, applying tape on pipes and operation of tester:	BUILDING	BASE RATE FRINGE BENEFITS	$23.39 10.70
BUILDING GROUP 5: Jackhammer, electrical gas or air driven tools, burning torch, wagon drill operators, tile layers, handling of all creosote material, signal men, tool room men and asphalt raker:	BUILDING	BASE RATE FRINGE BENEFITS	$23.47 10.70
BUILDING GROUP 6: Rock and powder men:	BUILDING	BASE RATE FRINGE BENEFITS	$24.45 10.70
BUILDING GROUP 7: Sand hog & mucker:	BULDING	BASE RATE FRINGE BENEFITS	$23.85 10.70
BUILDING GROUP 8: Caisson worker:	BUILDING	BASE RATE FRINGE BENEFITS	$24.42 10.70

CLASSIFICATIONS		RATE AND FRINGE BENEFITS	
LABORERS/HEAVY HIGHWAY			
General laborer, flagman, steam jenny:			
	HEAVY & HIGHWAY	BASE RATE	$16.40
		FRINGE BENEFITS	5.80
Hand blade operator, batch truck dumper, deck hand or scow man:			
	HEAVY & HIGHWAY	BASE RATE	$16.65
		FRINGE BENEFITS	5.80
Power driven tool operator of the following: wagon drill, chain saw, jack hammer, concrete saw, sand blaster, concrete chipper, pavement breaker, vibrator, power wheelbarrow, power buggy. Sewer pipe layer, bottom men, dry cement handler, concrete rubber, mason tender:			
	HEAVY & HIGHWAY	BASE RATE	$16.75
		FRINGE BENEFITS	5.80
Asphalt lute and rakerman, side rail setter:			
	HEAVY & HIGHWAY	BASE RATE	$16.80
		FRINGE BENEFITS	5.80
Gunnite nozzle man, gunnite operator:			
	HEAVY & HIGHWAY	BASE RATE	$16.90
		FRINGE BENEFITS	5.80
Tunnel laborer (free air):	HEAVY & HIGHWAY	BASE RATE	$16.95
		FRINGE BENEFITS	5.80
Tunnel mucker (free air):	HEAVY & HIGHWAY	BASE RATE	$17.00
		FRINGE BENEFITS	5.80
Tunnel miner, blaster and driller (free air):			
	HEAVY & HIGHWAY	BASE RATE	$17.35
		FRINGE BENEFITS	5.80
Caisson worker:	HEAVY & HIGHWAY	BASE RATE	$17.90
		FRINGE BENEFITS	5.80
Powderman:	HEAVY & HIGHWAY	BASE RATE	$18.00
		FRINGE BENEFITS	5.80
Drill operator of percussion type drills which are both powered and propelled by an independent air supply:			
	HEAVY & HIGHWAY	BASE RATE	$19.20
		FRINGE BENEFITS	5.80

CLASSIFICATIONS	RATE AND FRINGE BENEFITS	
MARBLE, TILE & TERRAZZO:		
SETTERS	BASE RATE	$22.39
	FRINGE BENEFITS	5.60
FINISHERS	BASE RATE	$15.39
	FRINGE BENEFITS	4.90
MILLWRIGHTS:	BASE RATE	$20.79
	FRINGE BENEFITS	14.04

OPERATING ENGINEERS:

BUILDING:

Auto patrol, batcher plant, bituminous paver, cableway, central compressor plant, clamshell, concrete mixer (21 cfm or over), concrete pump, crane, crusher plant, derrick, derrick boat, ditching and trenching machine, dragline, dredge operator, dredge engineer, elevating grader and all types of loaders, hoe type machine, hoist (1 drum when used for stack or chimney construction or repair), hoisting engine (2 or more drums), locomotive, motor scraper, carry-all scoop, bulldozer, heavy duty welder, mechanic, orangepeel bucket, piledriver, power blade, motor grader, roller (bituminous), scarifier, shovel, tractor shovel, truck crane, winch truck, push dozer, highlift, forklift (regardless of lift height and except when used for masonry construction), all types of boom cats, core drill, hopto, tow or push boat, A-Frame winch truck, concrete paver, gradeall, hoist, hyster, pumpcrete, Ross carrier, boom, tail boom, rotary drill, hydro hammer, mucking machine, rock spreader attached to equipment, scoopmobile, KeCal loader, tower cranes (French, German and other types), hydrocrane, backfiller, gurries, sub-grader, tunnel mining machines including moles, shields, or similar types of tunnel mining equipment:

BUILDING	*BASE RATE	$21.43
	FRINGE BENEFITS	8.02

Cable Crane Operators (50-ton and over), hydraulic crane (100-ton and over):

BUILDING	*BASE RATE	$21.98
	FRINGE BENEFITS	8.02

***Operators on cranes with booms one hundred fifty (150) feet and over (including jib) shall receive fifty ($.50) cents above base rate.**

CLASSIFICATIONS | RATE AND FRINGE BENEFITS

All air compressors (over 900 cfm), bituminous mixer, joint sealing machine, concrete mixer (under 21 cu. ft.), form grader, roller (rock), tractor (50 hp and over), bull float, finish machine, outboard motor boat, flexplane, fireman, boom type tamping machine, truck crane oiler, greaser on grease facilities servicing heavy equipment, switchman or brakeman, mechanic helper, whirley oiler, self-propelled compactor, tractair and road widening trencher and farm tractor with attachments (except backhoe, highlift and endloader), elevator (regardless of ownership when used for hoisting any building materials), hoisting engine (1 drum or buck hoist), forklift (when used for masonry construction, Firebrick masonry excluded), well points, grout pump, throttle-valve man, tugger, electric vibrator compactor:

BUILDING	BASE RATE	$18.42
	FRINGE BENEFITS	8.02

Bituminous distributor, cement gun, conveyor, mud jack, paving joint machine, roller (earth), tamping machine, tractors (under 50 hp), vibrator, oiler, concrete saw, burlap and curing machine, hydro-seeder, power form handling equipment, deckhand steersman, hydraulic post driver, and drill helper:

BUILDING	BASE RATE	$17.57
	FRINGE BENEFITS	8.02

HEAVY HIGHWAY CLASS A:
A-Frame Winch Truck, Auto Patrol, Backfiller, Batcher Plant, Bituminous Paver, Bituminous Transfer Machine, All types of Boom Cats, Bulldozer, Cableway, Carry-All Scoop, Carry Deck Crane, Central Compressor Plant Operator, Clamshell, Concrete Mixer (21 cu. ft. or over), Concrete Paver, Truck-Mounted Concrete Pump, Core Drills, Crane, Crusher Plant, Derrick, Derrick Boat, Ditching and Trenching Machine, Dragline, Dredge Operator, Dredge Engineer, Earth Movers, Elevating Grader and all types of Loaders, Grade-All, Gurries, Heavy Equipment Robotics Operator/Mechanic, Highlift, Hoe-Type Machine, Hoist (two or more drums), Hoisting Engine (two or more drums), Horizontal Directional Drill Operator, Hydraulic Boom Truck, Hydrocrane, Hyster, KeCal Loader, Letourneau, Locomotive, Mechanic, Mechanically Operated Laser Screed, Mechanic Welder, Mucking Machine, Motor Scraper, Orangepeel Bucket,Piledriver, Power Blade, Pumpcrete, Push Dozer, Rock Spreader attached to Equipment, All Rotary Drills, Roller (bituminous), Scarifier, Scoopmobile, Shovel, Side Boom, Subgrader, Tailboom, Telescoping Type Forklift, Tow or Push Boat, Tower Cranes (French, German and other types), Tractor Shovel, Truck Crane, Tunnel Mining Machines including Moles, Shields, or Similar types of Tunnel Mining Equipment:

HEAVY & HIGHWAY	BASE RATE	$20.35
	FRINGE BENEFITS	7.90

Operators on cranes with booms one hundred fifty feet (150') and over including jib shall receive $.50 above base rate.

CLASSIFICATIONS — RATE AND FRINGE BENEFITS

HEAVY HIGHWAY CLASS B:
All Air Compressors (over 900 cu. ft. per min.), Bituminous Mixer, Boom Type Tamping Machine, Bull Float, Concrete Mixer (under 21 cu. ft.), Electric Vibrator Compactor/Self-Propelled Compactor, Elevator (one drum or buck hoist), Elevator (regardless of ownership when used to hoist building material), Finish Machine, Firemen, Flex-Plane, Forklift (regardless of lift height), Form Grader, Hoist (one drum), Joint Sealing Machine, Mechanic Helper, Outboard Motor Boat, Power Sweeper (riding type), Roller (rock), Ross Carrier, Skid Mounted or Trailer Mounted Concrete Pumps, Switchman or Brakeman, Throttle Valve Man, Tractair and Road Widening Trencher, Tractor (50 HP and over), Truck Crane Oiler, Tugger, Welding Machine, Well Points, and Whirley Oiler:

HEAVY & HIGHWAY	BASE RATE	$17.93
	FRINGE BENEFITS	7.90

HEAVY HIGHWAY CLASS B2:
Greaser on Grease Facilities servicing Heavy Equipment:

HEAVY & HIGHWAY	BASE RATE	$18.31
	FRINGE BENEFITS	7.90

HEAVY HIGHWAY CLASS C:
Bituminous Distributor, Burlap and Curing Machine, Caisson Drill and Core Drill Helper (track or skid mounted), Cement Gun, Concrete Saw, Conveyor, Deckhand Oiler, Grout Pump, Hydraulic Post Driver, Hydro Seeder, Mud Jack, Oiler, Paving Joint Machine, Power Form Handling Equipment, Pump, Roller (earth), Steermen, Tamping Machine, Tractors (under 50 H.P.) and Vibrator:

HEAVY & HIGHWAY	BASE RATE	$17.67
	FRINGE BENEFITS	7.90

All Heavy Highway operators assigned to work below ground level are to be paid ten percent (10%) above base wage rate. This does not apply to open cut work.

PAINTERS:

Brush and Roller:	BASE RATE	$21.22
	FRINGE BENEFITS	11.59
Drywall, Tape and Wallcovering:	BASE RATE	$21.22
	FRINGE BENEFITS	11.59

Spray painting, floor sanding, power tools, sandblasting, steam cleaning pressure washing, lead abatement, hazardous waste, toxic chemicals, epoxy coatings, two-component materials

	BASE RATE	$22.34
	FRINGE BENEFITS	11.59

CLASSIFICATIONS		RATE AND FRINGE BENEFITS	
PLASTERERS:		BASE RATE	$22.84
		FRINGE BENEFITS	6.22

First 10 to 50 feet $.25 per hour above base rate, $.01 per foot for every additional foot above 50 feet. This shall include Swing Suspended Scaffolds or chairs and all other high and hazardous work. Working ten (10) feet below ground level or more shall receive $.25 above base rate scale for hazardous work.

PLUMBERS/PIPEFITTERS:		BASE RATE	$25.02
		FRINGE BENEFITS	17.10

ROOFERS: (Excluding Metal Roofs) BASE RATE		$13.50	
		FRINGE BENEFITS	1.90

SHEETMETAL WORKERS: (Including Metal Roofs)		BASE RATE	$23.12
		FRINGE BENEFITS	11.50

SPRINKLER FITTERS:		BASE RATE	$27.05
		FRINGE BENEFITS	12.90

TRUCK DRIVERS:

Truck Drivers:	BUILDING	BASE RATE	$9.50
		FRINGE BENEFITS	.72
Truck helper and warehouseman:			
	HEAVY & HIGHWAY	BASE RATE	$16.65
		FRINGE BENEFITS	5.80
Driver, winch truck & A-frame truck when used in transporting material:			
	HEAVY & HIGHWAY	BASE RATE	$16.75
		FRINGE BENEFITS	5.80
Driver, semi-trailer or pole trailer, dump truck, tandum axle, and driver of distributors:			
	HEAVY & HIGHWAY	BASE RATE	$16.85
		FRINGE BENEFITS	5.80
Driver on mixer trucks/all types:	HEAVY & HIGHWAY	BASE RATE	$16.90
		FRINGE BENEFITS	5.80

CLASSIFICATIONS		RATE AND FRINGE BENEFITS	
TRUCK DRIVES (CONTD)			
Truck mechanic:	HEAVY & HIGHWAY	BASE RATE	$16.95
		FRINGE BENEFITS	5.80
Driver, 3 tons & under, tire changer & truck mechanic helper:			
	HEAVY & HIGHWAY	BASE RATE	$16.98
		FRINGE BENEFITS	5.80
Driver of pavement breakers:	HEAVY & HIGHWAY	BASE RATE	$17.00
		FRINGE BENEFITS	5.80
Driver, over 3 tons & truck mounted rotary drill:			
	HEAVY & HIGHWAY	BASE RATE	$17.19
		FRINGE BENEFITS	5.80
Driver, Euclid & other heavy earth moving equipment & low boy:			
	HEAVY & HIGHWAY	BASE RATE	$17.76
		FRINGE BENEFITS	5.80
Greaser on greasing facilities:	HEAVY & HIGHWAY	BASE RATE	$17.85
		FRINGE BENEFITS	5.80

END OF DOCUMENT CR-4-028
JANUARY 5, 2009
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SECTION 00300

BID FORMS

PART 1 - BIDDER'S PROPOSAL FORM

BIDDER'S PROPOSAL
SANDY HOOK WATER DISTRICT
CONTRACT NO. 8 - 2008 WATER SYSTEM IMPROVEMENTS

Proposal of _____ (hereinafter called "BIDDER"), organized and existing under the laws of the State of _____, doing business as _____ (insert "a corporation", "a partnership", or "an individual" as applicable). Sandy Hook Water District (hereinafter called "OWNER").

In compliance with the Advertisement for Bids, BIDDER hereby proposes to furnish all equipment, materials and labor for the work required to construct **Contract No. 8- 2008 Water System Improvements, Sandy Hook Water District, Sandy Hook**. Kentucky in strict accordance with the Contract Documents, within the time set forth therein, and at the price stated below.

BID SCHEDULE

ITEM NO.	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL BID AMOUNT
1	200	LF	**2-inch Water Main,** PVC Pipe, Class 200 (ASTM D2241) SDR 21 with all appurtenances and fittings		
2	2800	LF	**3-inch Water Main,** PVC Pipe, Class 250 (ASTM D2241) SDR 17 with all appurtenances and fittings.		
3	7900	LF	**3-inch Water Main,** PVC Pipe, Class 200 (ASTM D2241) SDR 21 with all appurtenances and fittings.		
4	1100	LF	**4-inch Water Main,** PVC Pipe Class 200 (ASTM D2241) SDR 21 with all appurtenances and fittings.		
5	1400	LF	**4" Water Main,** PVC Pipe, Class 250 (ASTM 224X) SDR 17 with all appurtenances and fittings.		
6	800	LF	**6-inch Water Main,** PVC Pipe Class 200 C-900 (ASTM D2241) with all appurtenances and fittings		
7	1	EA	**2-inch** C.I. AWWA N.R.S. Gate Valve and Valve Box. Complete in Place.		

ITEM NO.	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL BID AMOUNT
8	4	EA	**3-inch** C.I.AWWA N.R.S. Gate Valve and Valve Box. Complete In Place.		
9	1	EA	4-inch C.I.AWWA N.R.S. Gate Valve and Valve Box. Complete In Place.		
10	6	EA	Tie Into Existing Water Main.		
11	8	EA	Replace existing meter settings w/new meter setting, meters, and reconnect to existing services.		
12	10	EA	Set new meter setting, meters, and appurtenances on new water mains.		
13	26	EA	Reconnect existing meter services to new water main		
14	25	EA	5/8" x 3/4" Resetter with Ind. Pressure Reducing Valve and Existing Meter		
15	800	LF	Additional 1" Polyethelene Tubing, CL. 250		
16	85	LF	12" Steel Casing Bored and Jacked		
17	275	LF	PVC Open Cut Casing		
18	1	LF	PRV Replacement in Existing Line w/new setter and prv		
19	240	LF	Type C Creek Crossing		
20	9	LF	Blow Off Assembly (Various Sizes)		

ITEM NO.	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL BID AMOUNT
21	2	LF	Flushing Hydrant Assembly (4" & 6")		
22	7	EA	Cut and Plug Existing Water Main		
23	1	LS	Hydropnuematic Pump Station, Electric, and Appurtenances. Complete in Place.		
24	4	EA	Tie-in to Existing Blow Off Assembly		
25	1	EA	3/4" Air Release Valve		
26	1	LS	Partial Fencing and Site Work of Cemetery Tank Site		
27	1	LS	Fencing and Site Work of Dehart Pump Station		
28	1	LS	Fencing and Site Work of Town Tank Site		
29	1	LS	Inspection and Site Work of Wrigley Tank		
30	1	LS	Inspection of Cemetery Tank		
31	60	LF	Driveway Bores w/PVC Casing		

TOTAL AMOUNT BID - (ABOVE ITEMS): _____ Dollars and

_____ (Cents) (_____).

The above prices shall include all labor, materials, overhead, profit, insurance and other costs necessary to cover the finished work of the several kinds called for. The price per foot for pipe installation includes all labor, materials, unclassified excavation, rock blasting and removal, clean-up, etc. for a finished product. Changes in the work shall be processed in accordance with the General Provisions.

By submission of this Bid, the BIDDER certifies, and in the case of a joint Bid each party thereto certifies as to its own organization, that this Bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this Bid, with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence work under this Contract on or before a date to be specified in the Notice to Proceed and to fully complete the project within **Ninety (90)** consecutive calendar days and an additional 90 calendar days for the pump station only. BIDDER further agrees to pay as liquidated damages, the sum of $ 300.00 for each consecutive calendar day thereafter as provided in the General Provisions.

Accompanying this Proposal is a certified check or standard Bid Bond in the sum of _____(Dollars) ($_____) in accordance with the Instructions to Bidders. The BIDDER, by submittal of this Bid, agrees with the OWNER that the amount of the bid security deposited with this Bid fairly and reasonably represents the amount of damages the OWNER will suffer due to the failure of the BIDDER to fulfill his agreements as provided in this Proposal.

BIDDER acknowledges receipt of the following Addenda:

_____

_____

BIDDER agrees that the OWNER reserves the right to delete the whole or any part of the Project from the Contract.

BIDDER understands that the OWNER reserves the right to reject any or all Bids and to waive any informalities in the Bidding.

BIDDER agrees that this Bid shall be good and may not be withdrawn for a period of ninety (90) calendar days after the actual date of bid opening.

BIDDER agrees to perform all of the Work described in the Specifications and shown on the Plans for the amount stated above. Within ten (10) calendar days after receiving written notice of the acceptance of this Bid by the OWNER, the BIDDER will execute and deliver to the OWNER ten (10) copies of the Agreement and such other required Contract Documents.

BIDDER:

_____

By_____

Title_____

Address _____

(Seal - If bid is by a corporation)

_____

Date Signed_____

END OF SECTION

SECTION 00400

SUPPLEMENTS TO BID FORMS

ALL PARTS ARE REQUIRED TO BE COMPLETED AND MUST BE SUBMITTED WITH THE BID. FAILURE TO COMPLETE ALL FORMS MAY BE CAUSE FOR REJECTION OF THE BID.

PART 1 - BIDDER'S QUALIFICATIONS

A. The required names and addresses of all persons interested in the foregoing Bid, as Principals, are as follows:

B. The Bidder shall submit the requested information indicated and for work of a similar character in size and total contract price that is included in the proposed Contract and references to enable the Owner to judge the Bidder's experience, skill and business standing.

1. Number of years in business as a contractor under present business name:

_____

2. Number of years of experience in type of construction required for this project:

_____

3. Have you ever been declared in default or failed to complete work awarded to you? If yes, where and why?_____

_____

4. Have you ever been cited by a regulatory agency for failure to comply with any of its contractual obligations?_____. If yes, where and why?_____

_____

5. List and age of owned equipment available for this project:_____

_____

6. List similar project experience with references where the Bidder was the prime contractor and percent work completed as prime and percent completed by subcontractors.

Project Name	Description of Work	Date Completed	Contract Amount	% Prime/ % Subcontract	Owner/Contact	Owner Phone No.
1.						
2.						
3.						
4.						
5.						

(Add supplementary pages if necessary)

PART 2 - SUBCONTRACTORS

All proposed subcontractors shall be listed below for each branch of work included in the proposed Contract. All subcontractors are subject to the approval of the Owner. Failure to submit a completed list may be cause for rejection of the Bid. Experience and references of all subcontractors shall be described on separate pages.

BRANCH OF WORK	NAME AND ADDRESS OF SUBCONTRACTOR
Highway Boring	
Pump Station	
Fencing	
Tank Cleaning/Inspection	
_____ (Other)	

(Add supplementary pages if necessary)

NOTES:

1. The OWNER in no way implies acceptance of any proposed subcontractor by acceptance of the Bid.
2. The CONTRACTOR will not be allowed to substitute subcontractors not listed herein without prior written approval of OWNER.
3. The CONTRACTOR shall indicate the percent or amount of work proposed by subcontractors for the total project or each branch of work listed.

SUBCONTRACTORS' REFERENCES

List similar project experience with references for each subcontractor proposed and the percent work completed by the subcontractors.

Project Name	Description of Work	Date Completed	Contract Amount	% Prime/ % Subcontract	Owner/Contact	Owner Phone No.
1.						
2.						
3.						
4.						
5.						

(Add supplementary pages if necessary)

PART 3 - MANUFACTURER'S LIST

A. The Bidder proposes to furnish the following equipment contingent upon its conformity to the Specifications and review and acceptance by the ENGINEER and OWNER.

B. Only one manufacturer's name is to be listed.

NAME OF MANUFACTURER	DESCRIPTION OF MATERIAL
_____	PVC Pipe
_____	Valves
_____	Pump Station
_____	Fittings
_____	Air Release Valve
_____	Hydrants
_____	_____
_____	

(Add supplementary pages if necessary)

NOTES:
1. OWNER in no way implies acceptance of such listed equipment by acceptance of the Bid.
2. The CONTRACTOR will not be allowed to substitute manufacturers not listed for the units above without prior written approval of OWNER.

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned,

_____ as Principal, and

_____ as Surety, are hereby held and firmly bound unto _____ as OWNER in the penal sum of _____ for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed, this _____ day of _____, 2009. The Condition of the above obligation is such that whereas the Principal has submitted to _____ a certain BID, attached hereto and hereby made a part hereof to enter into a contract in writing, for **Contract No. 8, 2008 Water System Improvements.**

NOW, THEREFORE,

(a) If said BID shall be rejected, or

(b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attachment hereto (Properly completed in accordance with said BID) and shall furnish a BOND for 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 be signed by their proper officers, the day and year first set forth above.

(SEAL)

Principal (Legal Signature)

(SEAL)

Surety

By

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

DEBARRED FIRMS

The undersigned hereby certifies that the firm of _____ has not and will not award a subcontract, in connection with any contract awarded to it as the result of this bid, to any firm that has been debarred for noncompliance with the Federal Labor Standards, Title VI of the Civil Rights Act of 1964, Executive Order 11246 as amended or any other Federal Law.

Name of Firm Submitting Bid

Signature of Authorized Official

Title

Date

CERTIFIED COPY OF CORPORATE RESOLUTION

(Name of Company)

I hereby certify that I am the duly elected and acting (Insert Title of Officer)

_____, a Corporation duly organized and existing under the laws of the State of _____; that on the _____ day of _____, 2009, the Board of Directors of said Corporation authorized and approved a certain Proposal to **Sandy Hook Water District** for the construction of certain improvements for **Contract No. 8 2008 Water System Improvements** by said Corporation and any contract resulting there from, and empowered the _____ (Insert Title of Officer) of said Corporation to execute said Proposal and Contract for and in behalf of said Corporation; that said authority is not contrary to any provision in the Articles of Incorporation or code of regulations or code of bylaws of said Corporation; ;that said authority has not been rescinded or modified; and that _____ (Insert Name of Signatory) is the duly elected and acting _____ (Insert Title of Office) of said Corporation.

IN WITNESS WHEREOF, I have hereunto subscribed my name on _____, 2009.

(Signature)

Subscribed and sworn to before me this _____ day of _____, 2009.

(SEAL)

NOTARY PUBLIC

NONCOLLUSION AFFIDAVIT

State of _____)

County of _____)

Bid Identification
Contractor,
being first duly sworn, deposes and says that he is
_____(sole owner, a partner, president, secretary, etc.) of _____, the party making the foregoing bid; that such bid is not made in the interest of or on behalf of any undisclosed person, partnership, company, association, organization, or corporation; that such bid is genuine and not collusive or sham; that said bidder has not directly b or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that said bidder has not in any manner, directly or indirectly, sought by agreement, communication or conference with anyone to fix the bid price of said bidder or of any other bidder, or to fix any overhead, profit, or cost element of such bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract or anyone interested in the proposed contract; that all statements contained in such bid are true; and, further that said bidder has not, directly or indirectly, submitted his bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid and will not pay any fee in connection therewith, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, or to any other individual except to such person or persons as have a partnership or other financial interest with said bidder in his general business.

SIGNED

TITLE

Subscribed and sworn to before me this _____ day of _____, 2008.

(SEAL)

NOTARY PUBLIC

- END OF SECTION -

SECTION 00500

AGREEMENT FORMS

PART 1 - NOTICE OF AWARD

TO:

PROJECT Description: Contract No. 8 - 2008 Water System Improvements for Sandy Hook Water District, Sandy Hook, Kentucky.

The OWNER has considered the BID submitted by you for the above-described WORK in response to its Advertisement for Bids dated _____, and Instructions to Bidders.

You are hereby notified that your BID has been accepted for items in the amount of $_____.

You are required by the Instructions to Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, and Payment BOND and certificates of insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID 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 to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this _____ day of _____, 2009.

:
OWNER

By

Title Chairman

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by _____, this the _____ day of _____, 2009.

By

Title

PART 2 - AGREEMENT

THIS AGREEMENT, made this the _____ day of _____, 2009, by and between the **Sandy Hook Water District** hereinafter called "OWNER" and _____ doing business as ("a corporation", "a partnership", or "an individual" as applicable), hereinafter called "CONTRACTOR".

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

1. Contractor will commence and complete the construction of the Contract No. 8 –2008 Water System Improvements for the Sandy Hook Water District.

2. The following documents shall constitute integral parts of this AGREEMENT, the whole to be collectively known and referred to as the CONTRACT DOCUMENTS and in the case of discrepancies among any parts of the CONTRACT DOCUMENTS, the most stringent shall apply.

3. The CONTRACTOR will furnish all of the materials, supplies, tools, equipment, labor and other services necessary for the construction and completion of the PROJECT described herein.

4. The CONTRACTOR will commence the work required by the CONTRACT DOCUMENTS within ten (10) calendar days after the date of the NOTICE TO PROCEED and will complete the same within **One Hundred and Eighty (180)** consecutive calendar days for the pump station, and **Ninety (90)** consecutive calendar days for all other items in the contract unless the period for completion is extended otherwise by the CONTRACT DOCUMENTS.

5. The CONTRACTOR agrees to perform all of the WORK described in the CONTRACT DOCUMENTS and comply with the terms therein for the sum of: _____ as shown in the Bid Schedule.

6. The term "CONTRACT DOCUMENTS" means and includes the following:

(A) Advertisement for Bids
(B) Instructions to Bidders
(C) Bid
(D) Bid Bond
(E) Agreement
(F) General Provisions
(G) Supplemental General Conditions
(H) Special Conditions
(I) Payment Bond
(J) Performance Bond
(K) Notice of Award
(L) Notice to Proceed
(M) Change Order
(N) Drawings prepared by O'BRIEN & GERE ENGINEERS, INC., and dated April, 2009.
(O) Technical Specifications prepared and issued by O'BRIEN & GERE ENGINEERS, INC. dated April, 2009.
(P) Addenda: None

7. The OWNER will pay to the CONTRACTOR in the manner and at such times as set forth in the General Conditions such amounts as required by the CONTRACT DOCUMENTS.

8. This AGREEMENT shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF, the parties hereto have executed or caused to be executed by their duly authorized officials, this AGREEMENT in six (6) copies each of which shall be deemed an original on the date first above written.

Sandy Hook Water District
OWNER

By_____
(Signature)

Name_____
(Print Name)
Title Chairman

(SEAL)

ATTEST:

(Signature)

Name
(Print Name)
Title

_____
CONTRACTOR

By_____
(Signature)

Name _____
(Print Name)
Address _____

_____

(SEAL)

ATTEST:

(Signature)

Name
(Print Name)

Title

PART 3 - NOTICE TO PROCEED

TO: _____

You are hereby notified to commence WORK in accordance with the AGREEMENT date _____, 2009, on or before _____, 2009, and you are to complete the WORK within **180 consecutive** calendar days for the pump station only, and **90 consecutive** calendar days for all other items. The date of completion of the pump station is _____. The date of completion for all other work is _____, 2009.

SANDY HOOK WATER DISTRICT
OWNER

By _____
(Signature)

Title Chairman

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED
is hereby acknowledged by:

this the _____ day of _____, 2009

CONTRACTOR

By _____

Title President

- END OF SECTION -

SECTION 00600

BONDS AND CERTIFICATES

PART 1 - PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENT: 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 _____

Sandy Hook Water District
(Name of Owner)

1000 Howards Creek Road
(Address of Owner)

hereinafter called OWNER.

_____.

_____Dollars ($_____)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, 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 _____, 2009, a copy of which is hereto attached and made a part hereof for the construction of:

_____

_____

PART 1 - PERFORMANCE BOND (Cont'd.)

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 the PRINCIPAL 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.

PROVIDED, FURTHER, that the liability of the PRINCIPAL and SURETY shall be subject to the same limitations and defenses as may be available to them against a claim hereunder by the OWNER.

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 AGREEMENT or to WORK to be performed thereunder or the Specifications accompanying same shall in any way 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 it is expressly agreed that the BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the AGREEMENT not increasing the Contract Price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the AGREEMENT as so amended. The term "Amendment", wherever used in this BOND, and whether referring to this BOND, the AGREEMENT or the Loan Documents shall include any alteration, addition, extension, or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the OWNER and the PRINCIPAL shall abridge the right of the other beneficiary hereunder, whose claim may be unsatisfied. The OWNER is the only beneficiaries hereunder.

PART 1 - PERFORMANCE BOND (Cont'd.)

IN WITNESS WHEREOF, this instrument is executed in __6__ counterparts, each one of which shall be deemed an original, this the _____ day of _____, 2009.

ATTEST:

_____
PRINCIPAL

_____
(PRINCIPAL) Secretary

By_____(s)

SEAL:

Address_____

_____

_____
Witness as to PRINCIPAL

Address_____

_____

ATTEST:

_____
SURETY

_____
Witness to SURETY

By_____
Attorney-In-Fact

Address_____

Address_____

_____

_____

NOTE: Date of BOND must not be prior to date of AGREEMENT.
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.

PART 2 - PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

_____
(Name of Contractor)

_____
(Address of Contractor)

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

_____
(Name of Surety)

hereinafter called SURETY, are held and firmly bound unto _____

Sandy Hook Water District
(Name of Owner)

1000 Howards Creek Road, Sandy Hook, Kentucky 40322
(Address of Owner)

hereinafter called OWNER.

_____Dollars ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, 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 AGREEMENT with the OWNER dated the _____ day of _____, 2009, 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, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extensions or modifications 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 for all labor cost incurred in such WORK including that by a SUBCONTRACTOR, and to any mechanic or materialman lienholder whether it acquires its lien by operation of State or Federal law; then this obligation shall be void, otherwise to remain in full force and effect.

PART 2 - PAYMENT BOND (Cont'd.)

PROVIDED, that beneficiaries or claimants hereunder shall be limited to the SUBCONTRACTORS, and persons, firms, and corporations having a direct contract with the PRINCIPAL or its SUBCONTRACTORS.

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 way 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 this contract or to the WORK or to the Specifications.

PROVIDED, FURTHER, that no suit or action shall be commenced hereunder by any claimant: (a) Unless claimant, other than one having a direct contract with the PRINCIPAL (or with the RUS in the event the RUA is performing the obligations of the OWNER), shall have given written notice to any two of the following: The PRINCIPAL, the OWNER, or the SURETY above named within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the PRINCIPAL, OWNER, or SURETY, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer; (b) After the expiration of eighteen (18) months following the date of which PRINCIPAL ceased work on said Contract, it being understood, however, that if any limitation embodied in the BOND is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

PROVIDED, FURTHER, that it is expressly agreed that this BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the Contract Price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the Contract as so amended. The term "Amendment", wherever used in this BOND and whether referring to this BOND, the Contract or the Loan Documents shall include any alteration, addition, extension or modification of any character whatsoever.

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.

PART 2 - PAYMENT BOND (Cont'd.)

IN WITNESS WHEREOF, this instrument is executed in __6__ counterparts, each one of which shall be deemed an original, this the _____ day of _____, 2009.

ATTEST:

_____
PRINCIPAL

_____
(PRINCIPAL) Secretary

By_____(s)

SEAL:

Address_____

_____

_____
Witness as to PRINCIPAL

Address_____

_____

ATTEST:

_____
SURETY

_____
Witness to SURETY

By_____
Attorney-In-Fact

Address_____

Address_____

_____

_____

NOTE: Date of BOND must not be prior to date of AGREEMENT.
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.

END OF SECTION

O'BRIEN & GERE

GENERAL PROVISIONS

GENERAL PROVISIONS

SECTION 1

DEFINITIONS

GP-1.01. DEFINITIONS

Whenever the words herein defined or pronouns used in their stead, occur in this Contract, they shall have the meaning given below:

ADDENDUM or **ADDENDA** shall mean the additional contract provisions issued in writing by the Owner prior to the receipt of bids.

BID shall mean the offer or proposal submitted, signed and sealed, in the form prescribed in the Contract Documents setting forth the prices for the Work to be performed.

BONDS shall mean any or all of the following: performance, payment, labor and material bonds and other instruments of security furnished by the Contractor and his surety or sureties in accordance with the Contract Documents.

CHANGE ORDER shall mean the formal document executed by the Owner incorporating any Modifications into the Contract.

CLAIM shall mean a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and the Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

CONTRACT or CONTRACT DOCUMENTS shall mean any or all of the following: the Advertisement or Invitation, Information for Bidders, Bid, Agreement, General Provisions, Special Provisions, Technical Specifications, Payment Items, Contract Drawings, all interpretations or Addenda thereto and Change Orders issued by the Owner or by the Engineer with the approval of the Owner.

Anything shown on the Contract Drawings and not mentioned in the Specifications or mentioned in the Specifications and not shown on the Drawings, shall have the same effect as if shown or mentioned, respectively, in both.

CONTRACT DRAWINGS shall mean those plans and drawings which show the scope and character of the Work and are specifically referred to as such in these Documents or in any Addendum or Addenda.

CONTRACTOR shall mean the Party of the Second Part to this Contract or the person, persons, partnership or corporations entering into this Contract for the performance of the Work required by it, and the legal representatives of said party or the agents appointed for said party in the performance of the Work.

ELEVATION or any abbreviation of the word shall mean the distance in feet above or below the datum established for the Project.

ENGINEER shall mean the Consulting Engineer or Engineers engaged by the Owner for the project and shall include any properly authorized assistants acting for the Consulting Engineer within the scope of the particular duties assigned to them.

FIELD ORDER shall mean a written notice issued by the Engineer to the Contractor for the purpose of clarifying or interpreting the Contract Documents, or to authorize minor changes or alterations in the Work which will not result in a change in the Contractor's cost or completion time.

INVERT shall mean the inside bottom of a pipe or the surface upon which sewage or water flows along the plan centerline of the completed Work.

MODIFICATION shall mean a written order to the Contractor, signed by the Engineer and the Owner on which is stated the addition, deletion or revision in the Work, together with any adjustment in Contract price or Contract time. One or more Modifications may be incorporated into a Change Order for making payments to the Contractor.

OWNER shall mean the Party of the First Part to this Contract or any person duly authorized to act for said First Party.

PROCEED ORDER shall mean a written order issued by the Owner to the Contractor to proceed with certain Work pending the resolution of disputes.

PROJECT shall mean the entire improvement to which the Contract relates.

SITE shall mean the area included within the property lines shown on the Contract Drawings including temporary easement, and other such areas adjacent thereto as may be designated by the Owner in writing.

SPECIFICATIONS shall mean any or all of the following: the Special Provisions, Technical Specifications, Payment Items and any Addenda pertaining thereto.

SUBCONTRACTOR shall mean any person, firm or corporation other than employees of the Contractor, who or which contracts with the Contractor to furnish, or actually furnishes labor, or labor and materials, or labor and equipment, or labor, materials and equipment at the Site.

SUBGRADE shall mean the bottom line or surface to which excavations are necessarily made for purpose of building the Work in accordance with the Contract Drawings, not including the additional depth of excavation required for any special foundation that may be ordered.

SURETY or SURETIES shall mean the Bondsmen or party or parties who have made secure the fulfillment of the Contract by a Bond and whose signatures are attached to said Bond.

WORK shall mean everything expressly or impliedly required to be furnished and done by the Contractor under the Contract, including extra work.

WRITTEN NOTICE. The term "notice" as used herein shall mean and include all written notices, demands, instructions, claims, approvals and disapprovals required to obtain compliance with contract requirements. Written Notice shall be deemed to have been duly served if: 1) delivered in person to the individual or to a member of the firm or to an officer of the corporation at the location specified in the Contract Documents, or 2) if delivered at the last business address provided by the person to whom addressed, or 3) if sent by certified or registered mail, or ordinary mail, or 4) if sent by facsimile followed by ordinary mail, certified mail, postage paid, return receipt requested, or 5) if sent by nationally recognized overnight carrier (against receipt) or 6) if sent by telegraph to the last business address.

SECTION 2

PERFORMANCE OF WORK

GP-2.01. PERMITS, LAWS AND REGULATIONS

Where the Owner is required to obtain permits for the Project, the permits have been or will be obtained and are noted in the Special Provisions. The Contractor shall take out all other necessary permits from the County, State, municipal or other public authorities; shall give all notices required by the law or municipal ordinances and shall pay all fees and charges incidental to the due and lawful execution of the Work done under this Contract.

The Contractor shall keep itself fully informed for the duration of the Contract of all laws, ordinances, regulations, and applicable codes affecting those engaged or employed in the Work, or the materials used in the Work, or affecting the conduct of the Work, and of all orders, decrees and instructions of bodies or tribunals having jurisdiction or authority over the same. If any discrepancy or inconsistency should be discovered in the Contract Documents in relation to any such law, ordinance, regulation, codes, order, decree, or instruction, the Contractor shall forthwith report the same in writing to the Engineer.

The Contractor shall at all times observe and comply with and shall cause all its agents and employees to observe and comply with all such existing and future laws, ordinances, regulations, codes, orders, decrees and instructions.

Any provisions of these General Provisions which is shown with the agreement of the Owner to contradict or conflict with the mandates of the applicable law in the jurisdiction where the Project is located, shall be interpreted and enforced to comply 1) with, the requirements of the applicable law and 2) to the maximum practicable extent, with the original intent of these General Provisions.

GP-2.02. CARE AND PROTECTION OF THE WORK

From the commencement until the acceptance of the Work, the Contractor shall be solely responsible for the care of the Work covered by the Contract and for the materials, supplies and equipment delivered at the Site intended to be used in the Work; and all injury or damage to the same from whatever cause, shall be made good at his expense. The Contractor shall provide suitable means of protection for and shall protect all materials intended to be used in the Work, all Work in progress, and all completed Work. The Contractor shall take all necessary precautions to prevent injury or damage to the Work by flood, fire, freezing or from inclemencies of the weather.

The Contractor shall neither load nor permit any part of a structure to be loaded with weights that will endanger the structure, and shall not subject any part of the Work to stresses or pressures that will endanger it.

In the event that the Owner must take occupancy and the Contractor is behind schedule, the provisions of the article still apply.

GP-2.03. CLEANING STRUCTURES AND SITE

As the Work progresses, the Contractor shall remove all unused materials, tools, equipment and machinery, waste materials, rubbish, refuse and other debris from the Site and see to it that the Site is at all times maintained in a neat and orderly condition.

At the completion of the Work, the Contractor shall promptly remove all construction tools, equipment and machinery, surplus materials, waste materials, rubbish, refuse and other debris from the Site and leave the Site in a neat and orderly condition. The Contractor shall also see to it that all pipelines, buildings, and other structures are left in a bright, polished, and new-appearing condition.

Whenever the Contractor neglects his responsibilities as set forth above, or neglects the repairing of streets, roadways, passageways or areas, or the repairing of fences or damages, the Engineer will give notice to that effect to

the Contractor. If the Contractor does not take reasonable steps upon receipt of such notice to correct the neglected situation, the Owner may do so, and the expense thereby incurred shall be deducted from any monies due or that may become due to the Contractor.

If a dispute arises between the separate Contractors as to their responsibilities for cleaning up, etc., as required above, the Owner may do such work as it deems appropriate and charge the cost thereof to the several Contractors as it shall determine to be just. The Owner's determination shall be binding and final.

GP-2.04. SANITARY REGULATIONS

Sanitary conveniences in sufficient numbers and convenient locations for the use of all persons employed on the Work, properly screened from public observation, shall be provided, maintained, and removed by the Contractor or by the General Contractor. The contents of the same shall be removed and disposed of in accordance with applicable laws codes and regulations. The Contractor shall rigorously prohibit the committance of nuisances within, on, or about the Work.

The Contractor and each Subcontractor shall supply sufficient drinking water to all of his employees.

The Contractor shall also obey and enforce such other sanitary regulations and orders and shall take such precautions against infectious diseases as may be deemed necessary by the responsible authority.

GP-2.05. FIELD CONTROL OF THE WORK

All work shall be constructed in accordance with the lines, grades and elevations shown on the Contract Drawings or as given by the Engineer in the field. The Contractor shall be fully and solely responsible for maintaining alignment and grade.

Control lines and elevations will be established by the Engineer as outlined in the Special Provisions. The Contractor shall, without additional compensation, provide all stakes, grade boards, cleats, nails, and such other materials and give such assistance to the Engineer as may be required to establish control lines and elevations. The Contractor shall inform the Engineer in writing a reasonable time in advance of the times and places at which he intends to do work in order that control lines and elevations may be established with the minimum of inconvenience to the Engineer or delay to the Contractor.

The Contractor shall protect and safeguard all points, stakes, grade marks, monuments, and bench marks at the Site of the Work, and shall re-establish, at its expense, any marks which are removed or destroyed due to construction operations. The Contractor shall bear the entire expense of rectifying Work improperly installed due to not maintaining or protecting marks, or to removing, without the Engineer's written approval, any such established points, stakes, or marks.

GP-2.06. LAND AVAILABLE TO CONTRACTOR

The Owner will furnish not later than the date when needed by the Contractor, reasonable access to the lands upon which the Work is to be done, rights-of-way for reasonable access thereto, and such other lands which are designated for the use of the Contractor. Land and easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by the Owner.

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

The Contractor shall confine its operations to such portions of the property of the Owner, as may be designated by the Owner from time to time for such use and to the rights-of-way or easements acquired for the Work. Private property adjacent to the Work shall not be entered upon or used by the Contractor for any purpose whatsoever without the written consent of the owner thereof.

All Work in connection with the Contract within or bordering on private or public property shall be conducted in such manner as will cause the minimum inconvenience and disturbance to it. No excavated materials

or supplies of any kind shall be stored on private or public premises without the Owner's written consent and in accordance with all applicable regulations, and all walks and driveways shall be kept open to uninterrupted passage.

The Contractor shall at its expense whenever so required by the Owner, erect and maintain fences along the roadways and around the grounds occupied by the Contractor, which fences shall be sufficient for the protection of the adjoining property and all persons lawfully using the same.

GP-2.07. TRAVEL NOT TO BE OBSTRUCTED

The Contractor shall not allow travel upon any street, park, roadway, or alley to be hindered or inconvenienced needlessly, nor shall the same be wholly obstructed without the written permission of the owner thereof. Upon receipt of such permission the Contractor shall cause plain and properly worded signs announcing such fact to be placed, with proper lighted barricades, at the nearest cross streets, upon each side of such obstructed portion, where travel can pass around the same in the shortest and easiest way.

The driveways to and from all fire department buildings and those required by all manufacturing plants, industrial establishments, and other business concerns for the proper continuance of their commerce shall be kept open and maintained in passable condition at all times unless modified by agreement between the Contractor and the property owner. The Contractor shall give reasonable notice to the owners of all private ways before interfering with them.

The Contractor shall give reasonable written notice to concerned police, bus, fire, ambulance, and school bus departments before initiating any activity which will restrict public travel or access to private property.

GP-2.08. MAINTAINING FLOW OF SEWERS, WATER LINES AND DRAINS

The Contractor shall, at its expense, provide for and maintain the flow of all sewers, drains, house inlet connections, and water courses which may be met with during the progress of the Work. The Contractor shall not allow the contents of any sewer, drain, or house inlet connection to flow into trenches, sewers, or other structures to be constructed under the Contract, and shall at its expense, immediately remove from the vicinity of the Work and cart away to a proper disposal site all offensive matter.

The Contractor shall, at its expense, provide for and maintain the flow in all water mains or laterals which may be met with during the progress of the Work. When water mains or laterals are to be disturbed to the extent that the water will be shut off, the superintendent of the water utility and all parties being served by the lines involved shall be notified 72 hours in advance concerning time and duration of the shut-off period. In cases involving fire hydrants, the fire department shall be so notified.

In the case of accidental damage to a water or sewer line, gas main or electrical conduit, the repairs of such break shall have priority over all other operations. The parties whose services are affected by the break shall be notified at once and all assistance given to supply emergency water, gas, or electricity where necessary by temporary lines, tank truck, or other means. The Contractor shall have the obligation at its expense to assure that all water, gas, electric and sewer connections serving private or public property shall be promptly and correctly restored to the utility company's specifications.

GP-2.09. COLLATERAL WORK

During the progress of the Work the Owner reserves the right to award other contracts relating to the Project or for work on sites adjoining or adjacent to that on which the Work covered by this Contract is to be performed. The Contractor shall afford the other contractors who are parties to such contracts reasonable opportunity for the introduction and storage of materials and equipment and the execution of Work and shall properly connect and coordinate its Work with theirs.

The Contractor shall keep itself informed of the progress and the detail work of other contractors and shall notify the Engineer immediately in writing of lack of progress or defective workmanship on the part of other contractors where such delay or such defective workmanship will interfere with its own operations. Failure of a Contractor to keep informed of the Work progressing on the Site or failure to give notice of lack of progress or

defective workmanship by others shall be construed as acceptance of the status of the Work as being satisfactory for proper coordination with its own Work and shall constitute a waiver of any and all claims against the Owner or Engineer relating thereto in any way.

The Contractor shall do all cutting, fitting, and patching for its Work that may be required to make its several parts come together properly and fit it to receive or be received by the work of others. The Contractor shall not endanger any Work of others by cutting, excavating, or otherwise altering their work, except with the written consent of the other contractor and the Engineer.

If the performance of additional Work is undertaken by other contractors, and if the Contractor believes that the performance of such additional Work will cause additional expense or will require an extension of time, a claim therefor may be made as provided for herein.

The Contractor agrees that it has and will make no claim for damages against the Owner by reason of any act or omission to act by any other contractor or in connection with the Engineer's or Owner's acts or omissions to act in connection with such other contractor, but the Contractor shall have a right to claim such damages from the other contractors, under a provision similar to the following provision which has been or will be inserted in the Contract with such other contractors.

Should any other contractor, having or who shall hereafter have a contract with the Owner relating to the Project or in connection with the Work on sites adjoining or adjacent to that on which the Work covered by this Contract is to be performed, sustain any damage through any act or omission of the Contractor, the Contractor agrees to reimburse such other contractor for all such damages and it further agrees to defend, indemnify, and save harmless the Owner from all claims for such damages by whomever made or presented.

GP-2.10. FURNISHING AND USE OF CONTRACT DOCUMENTS

Unless otherwise stated in the Special Provisions, the Contractor will be furnished, free of charge, three copies of the Contract Documents, including three sets of reduced and three sets of full-size Contract Drawings where drawings have been reduced. Additional sets will be furnished to the Contractor, but only to the limit of availability. Any other copies of the Contract Documents, which the Contractor may desire, can be obtained by the Contractor from the Engineer at the cost of duplication thereof.

The Contractor shall keep at the Site of the Work at least two copies of the Contract Documents and shall at all times provide the Engineer, and other representatives of the Owner, access thereto. One copy shall be available for ready reference and the other shall be used for record purposes.

GP-2.11. RECORD DRAWINGS

The copy of the Contract Drawings provided to the Contractor for record purposes in accordance with Section GP-2.10 above, shall be annotated by the Contractor to record all changes made during the construction process. Said copy shall be available to the Engineer and shall be delivered to the Owner by the Contractor upon completion of the Project.

GP-2.12. SLEEVES, INSERTS, CHASES AND OPENINGS

Where there is more than one Contractor on a Project and unless otherwise designated on the Contract Drawings, the General Contractor shall install in new floors, roofs, walls, and other structures constructed by it all sleeves, inserts, chases, and openings to fit its own Work and that of other contractors. The sleeves and inserts shall be provided by the installers of the pipes, ducts, conduits, and related equipment but shall be placed by the General or otherwise designated Contractor as directed by the installers of the pipes, ducts, conduits and related equipment. It is the responsibility of the General or otherwise designated Contractor to give other contractors reasonable notice as to when items provided by the other contractors will be placed in the Work.

Patching and finishing around the pipes, ducts, conduits, and related equipment after installation shall be by the same Contractor or Contractors installing the pipes, ducts, conduits, and related equipment.

Where sleeves, inserts, chases, or openings are required in existing floors, roofs, walls, and other structures, they shall be installed by the same Contractor or Contractors installing the pipes, ducts, conduits, and related equipment.

GP-2.13. PROVISIONS REQUIRED BY LAW DEEMED INSERTED

Each and every provision required by law to be inserted in this Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though such provisions were included herein. If through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the Contract shall forthwith be physically amended to make such insertion.

GP-2.14. INVALID PROVISIONS

If any term or provision of the Contract Documents or the application thereof to any person, firm or corporation, or circumstance shall, to any extent, be invalid or unenforceable, the remainder of the Contract Documents, or the application of such terms or provisions to persons, firms or corporations, or circumstances other than those to which it is held invalid or unenforceable, shall not be affected thereby and each term or provision of the Contract Documents shall be valid and be enforced to the fullest extent permitted by law.

GP-2.15. APPLICABLE STANDARDS

Reference to codes, manuals or standard specifications of any technical society, organization or association or to the code of any governmental authority, whether such reference be specified or implied, shall mean the latest code, manual or standard specification in effect at the time of opening of the Bids, except as may be otherwise specifically provided in the Contract Documents.

However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of OWNER, CONTRACTOR or ENGINEER, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to ENGINEER, or any of ENGINEER's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of the Contract Documents.

SECTION 3

TIME PROVISIONS

GP-3.01. COMMENCEMENT AND COMPLETION OF WORK: TIME OF ESSENCE

The Contractor shall commence the Work within ten days following the date of notice to proceed and fully complete the Work within the time specified in the Bid. The Contractor shall notify the Engineer, in writing, of its intention to enter upon the Site of the Work at least five days in advance of such entry.

Time is of the essence of this Contract with respect to the Work to be performed. The Contractor shall proceed expeditiously with the Work with adequate forces. The Contractor hereby confirms that the times set forth for completion of the Work are reasonable periods of time for performing and completing the Work.

GP-3.02. RATE OF PROGRESS

The progress of the Work shall be in accordance with the approved schedule and shall be such that all Work under the Contract will be completed within the time specified, or before such later date to which the time of completion may have been extended by the Owner.

The Contractor shall within ten days following the execution of this Contract prepare and submit to the Engineer for approval, two copies of a practical and feasible Work schedule showing the order and date on which the several salient features (including equipment) will be started and completed.

The Work schedule shall be in the form of a cash and resource loaded critical path schedule.

Where there is more than one Contract on the Project, the General Contractor shall, within ten days following the execution of its Contract with the Owner, submit two copies of its own proposed Work schedule to the Engineer for review. After review, sufficient additional copies of the schedule shall be submitted to the Engineer for transmittal of two copies to each of the other Contractors, who shall then prepare and submit their own Work scheduled for review. The General Contractor shall then incorporate these schedules into its schedule.

The Contractor on each Contract shall adhere to the approved Work schedule for its Contract. In the event a Contractor does not adhere to its Work schedule and causes other Contractors to be damaged, the Contractor causing the delay shall defend, indemnify, and save harmless the Owner and Engineer from all actions and charges of the other Contractors against the Owner or Engineer caused by said delay including all costs, disbursements and attorneys' fees.

The Contractor shall update and resubmit its own schedule every month, unless the Engineer requests less frequent updatings.

GP-3.03. EXTENSION OF TIME

If the Contractor is obstructed or delayed in the prosecution or completion of the Work by any cause beyond the control of the Contractor, including the neglect, delay or default of the Owner, Engineer or of any other contractors for adjoining or contiguous work, or by any damage that may happen thereto, unusual action of the elements taking account of the location of the Project, or by the abandonment of the Work by the employees in a general strike, or by any delay on the part of the Owner or Engineer doing work or furnishing material, the Contractor shall have no claim for damages against the Owner or Engineer for any such cause or delay, but may in such case be entitled to a reasonable extension of time specified herein for the completion of the Work, provided, however, that claim for such extension of time be made by the Contractor in writing within thirty calendar days from the time when such alleged cause for delay shall occur. Any extension granted shall constitute the sole and only redress to the Contractor for any claims of any nature whatsoever caused or in any way related to such delay.

An application for an extension of time must set forth in detail using a critical path analysis the source and the nature of each alleged cause of delay in the completion of the Work, the date upon which each such cause of

delay began and ended, and delay attributable to each of such causes. The Contractor shall, however, be entitled to an extension of time for such causes only for the number of calendar days of delay which the Owner may determine to be due solely to such causes, and then only if the Contractor shall have strictly complied with all of the requirements of this Section.

The Contractor shall not be entitled to receive a separate extension of time for each one of several causes of delay operating concurrently, but, if at all, only for the actual period of delay in completion of the Work as determined by the Owner irrespective of the number of causes contributing to produce such delay. If one of several causes of delay operating concurrently results from any act, fault or omission of the Contractor or of his subcontractors or materialmen, and would of itself (irrespective of the concurrent causes) have delayed the Work, no extension of time will be allowed for the period of delay resulting from such act, fault or omission.

SECTION 4

SURFACE AND SUBSURFACE CONDITIONS

GP-4.01. PROTECTION, EXISTING STRUCTURES

It shall be the sole responsibility of the Contractor and at its expense to protect adjacent and other property or premises from damage of any kind during the progress of the Work and shall erect and maintain guards around its Work in such a way as to afford protection to the public. The Contractor shall be held responsible for improper, illegal, or negligent conduct of itself, and its subcontractors, employees and agents in and about said Work or in the execution of the Work covered by this Contract.

It shall be the sole responsibility of the Contractor, and at its expense to sustain in their places and permanently protect from direct or indirect injury any and all pipelines, subways, pavements, sidewalks, curbs, railways, buildings, trees, poles, wells, and other property in the vicinity of his Work, whether over- or underground, or which appear within the trench or excavations, and it shall assume all costs and expenses for direct or indirect damage which may be occasioned by injury to any of them.

The Contractor's liability shall also include the damage or injury sustained by any structure whatsoever due to settlement of trenches or excavations or to settlement or lateral movement of the sides of such trenches or excavations, whether such movement occurs during or after excavation or backfilling of such trenches or excavations. The responsibility to so support and protect all such structures from damage or injury shall continue, without limitation, throughout the Contract period and during the period of guarantee.

The Contractor shall at all times have available onsite suitable and sufficient material and shall use the same as may be necessary or required for sustaining and supporting any and all such structures which are uncovered, undermined, weakened, endangered, threatened, or otherwise materially affected.

In case injury occurs to any portion of a pipeline or structure, or to the material surrounding or supporting the same, through blasting or similar operations, the Contractor shall immediately notify the Engineer, and, at the Contractor's expense, shall remove such injured Work and shall rebuild the pipeline or structure and shall replace the material surrounding and supporting the same, or shall furnish such material and perform such work of repairs or replacements as the Engineer may order. In the case of utilities, the Contractor shall immediately notify the utility company, and provide all assistance for the repair of the utility by the utility company unless authorized to undertake such repairs directly by the utility company. Any damage whatsoever shall be promptly, completely, and satisfactorily repaired by the Contractor at its expense to the satisfaction of the Owner, or owner of the utility.

GP-4.02. EXISTING SUBSURFACE STRUCTURES

(a) General

Certain existing subsurface structures likely to be encountered during the performance of the Work embraced in this Contract or located in close proximity to the Work hereunder as to require special precautions and methods for their protection, such as sewers, drains, water mains, and conduits, together with appurtenances, are shown on the Contract Drawings. The sizes, locations, and depths shown are approximate.

It is the obligation of the Contractor to verify the accuracy and completeness of the information shown, and the Contractor agrees that it shall neither have nor assert against the Owner or Engineer any claim for damages or extension of time or relief from any obligation of this Contract by reason of the inaccuracy, inadequacy, incompleteness, or other deficiency of the information given or the failure to furnish additional or further information in the possession of the Owner or Engineer, except as set forth in subsection (b) and (c) below.

Contractor is hereby given notice that subsurface structures and facilities may be located on the site which are either not identified or are mislocated on the Contract Documents.

Where any existing subsurface structure such as a sewer, drain, gas pipe, water pipe, conduit, or other structure is found which is not anticipated by the Contract Documents or which is found to be materially different in size, location, or depth from that anticipated by the Contract Documents, the Contractor shall immediately notify the Engineer, and also the superintendent of the utility, before disturbing the structure.

Contractor shall use due care to avoid damage to subsurface facilities identified, not identified or mislocated on Contract Documents.

If ordered by the Engineer, such structure shall be uncovered and supported by the Contractor, at its cost and expense, as constituting a part of the Contract, and the Contractor shall not become entitled to claim any damages for or on account of the presence of such structure or the uncovering and supporting of same.

(b) Existing subsurface structures which require changes in the Work of the Contract.

The Engineer will determine whether changes should be made in the Contract Documents for construction of the Work of the Contract to avoid the subsurface structure, whether the Work of the Contract can proceed without changes in the Contract Documents, or whether the structure should be removed, realigned, or changed.

Any increase in cost of the Work resulting from any changes in the Contract Documents necessitated by the unanticipated presence or difference in size, location, or depth of the subsurface structure will be adjusted in the manner provided herein for changes in Contract amount.

(c) Existing subsurface structures which require changes in the existing structure.

Where the size, location, or depth of the existing subsurface structure has been anticipated and the Contract Documents require removal, realignment, or change, all Work under this Contract shall be done in accordance with the Contract Documents in mutual cooperation with the utility or other parties concerned.

Where the presence of the subsurface structure or its size, location, or depth is not anticipated by the Contract Documents, any work by the Contractor required to remove, realign, or change the structure shall be done under the provisions for changes in the Work for the removal, realignment, or change and shall be done as mutually agreed by the Contractor, Engineer, and utility or other parties concerned.

(d) Interruption of Service

Where it is necessary to interrupt water, gas, or other public utility service to remove, realign, or change a subsurface structure, the Work shall proceed with expedience and shall be continuous after interruption of service until completion of the removal, realignment, or change and return of the utility service to its normal state.

GP-4.03. SUBSURFACE CONDITIONS OTHER THAN STRUCTURES FOUND DIFFERENT

Reference is made to the Information for Bidders Section of these Contract Documents and the obligations of the Contractor to perform all necessary subsurface investigations prior to bidding. Furthermore, the Contractor shall not be entitled to rely upon the subsurface investigation performed by the Owner or the Engineer.

GP-4.04. PROTECTION OF UTILITIES

All utilities whose facilities may be affected by the Work of the Contract shall be notified by the Contractor at least 72 hours in advance of the start of any operations which might affect such facilities.

The removal, replacement, support, or other handling of private and public utilities coming within the lines of the Work shall be accomplished by the Contractor at its expense in accordance with arrangements satisfactory to the owner or operator of the utility involved. The Contractor, at its expense, shall remove, replace, or support all utilities as required.

The Contractor shall not permit nor cause any hindrance to or interference with any individual, municipal department, public service corporation, or other company or companies in protecting its or their mains, pipes, poles, posts, or other structures, nor in shifting, removing, or replacing the same. The Contractor shall allow said

individual, department, company, or companies to take all such measures as they may deem prudent to protect their structures.

GP-4.05. REPLACEMENT OF PROPERTY

The Contractor shall replace all pavement, driveways, fences, shrubs, lawns, trees, and any other public or private property damaged as a result of the Work under this Contract. All such replacement shall be done in accordance with the applicable specifications and no separate or extra payment will be made unless specifically provided for in the Payment Items. In all cases said replacement shall be new and at least equal to the original conditions.

SECTION 5

OWNER'S STATUS

GP-5.01. OWNER'S RIGHT TO SUSPEND WORK

If, in the opinion of the Owner the Work is defective, or the Contractor fails to supply sufficient skilled workmen or suitable materials or equipment, or if the Contractor fails to make prompt payments for labor, materials or equipment, or if other good cause exists, the Owner may order the Contractor to suspend the Work or any portion thereof until the cause for such order has been eliminated. This right of the Owner to suspend the Work shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other party. The Contractor shall have no claim or damages against the Owner for any delay due to such suspension of Work, provided, however, that in case of the suspension of Work due to circumstances beyond the control of the Contractor, the time within which the Contractor is required to complete the Work, shall be extended by as many calendar days as the Work was suspended. Such extended time of completion shall be the Contractor's only compensation for the suspension of Work as above provided.

GP-5.02. CONTRACTOR'S DEFAULT

In addition to those instances provided in other sections of this Contract, the Owner shall have the right to declare the Contractor in default of the whole or any part of the Work under conditions including but not limited to:

(a) The Contractor files a voluntary petition in bankruptcy or shall be adjudicated a bankrupt or insolvent, or shall file any petition or answer seeking any reorganization, arrangement, liquidation, dissolution, or similar relief for itself under any statute, law, or regulation, or shall seek or consent to or acquiesce in the appointment of any trustee, receiver, or liquidator of the Contractor, or of all or any substantial part of his properties or assets, or shall make any general assignment for the benefit of creditors, or shall admit in writing to inability to pay its debts generally as they become due; or if

(b) A petition is filed against the Contractor seeking any reorganization, arrangement, liquidation, dissolution, or similar relief under any statute, law, or regulation, and shall remain undismissed or unstayed for an aggregate of thirty days (whether or not consecutive); or if

(c) Any trustee, receiver, or liquidator of the Contractor or of all or any substantial part of its properties or assets is appointed without the consent or acquiescence of the Contractor and such appointment shall remain unvacated or unstayed for an aggregate of thirty days (whether or not consecutive); or if

(d) A receiver or receivers are appointed to take charge of the Contractor's property or affairs; or if

(e) The Contractor fails to commence work when notified to do so by the Owner; or if

(f) The Contractor abandons the Work as evidenced by removing workman, materials or equipment from the site; or if

(g) The Contractor refuses to proceed with the Work when and as directed by the Owner; or if

(h) The Contractor without just cause reduces its working force to a number which, if maintained, would be insufficient, in the opinion of the Owner to complete the Work in accordance with the approved time progress schedule, and fails or refuses to sufficiently increase such working force when ordered to do so by the Owner; or if

(i) The Contractor sublets, assigns, transfers, conveys, or otherwise disposes of the Contract other than as permitted by the contract; or if

(j) The Owner is of the opinion that the Contractor is or has been unnecessarily or unreasonably or willfully delaying the performance and completion of the Work, or the award of necessary subcontracts; or if

(k) The Owner is of the opinion that the Work cannot be completed within the time herein provided therefor or within the time to which such completion may have been extended, provided however, that the impossibility of timely completion is, in the Owner's opinion, attributable to conditions within the Contractor's control; or if

(l) The Work is not completed within the time herein provided therefor or within the time to which the Contractor may be entitled to have such completion extended; or if

(m) The Owner is of the opinion that the Contractor is or has been willfully or in bad faith violating any of the provisions of this Contract; or if

(n) The Owner is of the opinion that the Contractor is not or has not been executing the Contract in good faith and in accordance with its terms.

The Owner's exercise of this right shall not give rise to any claim or cause of action by the Contractor for damages of any nature whatsoever.

Before the Owner shall exercise its right to declare the Contractor in default by reason of the conditions set forth in the above items a, e, f, g, h, j, k, l, m and n, it shall give the Contractor and/or surety three working day's notice of its intention to declare the Contractor in default and unless, within such three day period, the Contractor shall make arrangements satisfactory to the Owner to correct or eliminate the conditions set forth in the Owner's aforesaid notice, the Contractor may be declared in default at the expiration of such three-day period or at the expiration of such longer period of time as the Owner may determine.

The right to declare the Contractor in default for any of the grounds specified or referred to shall be deemed exercised by the Owner sending the Contractor and surety a written notice at the address provided herein setting forth the ground or grounds upon which such default is to be declared. Upon receipt of notice that it is to be declared in default, the Contractor shall do only those acts reasonably related correcting the default or concluding its operations and demobilizing the site; leaving untouched all plant, materials, equipment, tools and supplies then on Site except as the Owner may otherwise direct.

The Owner, after declaring the Contractor in default, may then have the Work completed by such means and in such manner, by contract, with or without public letting, or otherwise, as it may deem advisable, utilizing for such purpose such of the Contractor's plant, materials, equipment, tools, and supplies remaining on the Site, and also such subcontractors as it may deem advisable, or it may call upon the Contractor's surety at its expense to do so.

In the event that the Owner declares the Contractor in default of the Work or any part of the Work, the Contractor, in addition to any other liability to the Owner hereunder or otherwise provided for or allowed by law, shall be liable to the Owner, for all of Owner's costs and expenses, including, without limitation legal fees and expenses the Owner incurs for additional advisory and engineering services necessary, in its opinion, because of the default and, for the total amount of liquidated damages from the date when the Work should have been completed by the Contractor in accordance with the terms hereof to the date of actual completion of the Work, any of which shall be considered as expenses incurred by the Owner in completing the Work and the amount may be charged against and deducted out of such monies as would have been payable to the Contractor or its surety if the Work had been completed without default.

If the Owner completes the Work, the Engineer shall issue a certificate stating the expenses incurred in such completion, including the cost of reletting. Such certificate shall be final, binding, and conclusive upon the Contractor, its surety, and any person claimed under or through the Contractor as to the amount of such expenses, except as may be modified by the Owner to reflect damages incurred.

The costs and expense of such completion, as certified by the Engineer, shall be charged against and deducted out of such monies as would have been payable to the Contractor if it had completed the Work; the balance

of such monies, if any, subject to the other provisions of the Contract, shall be paid to the Contractor without interest after such completion. Should the expense of such completion, as certified by the Engineer, exceed the total sum which would have been payable under the Contract if the same had been completed by the Contractor, such excess shall be paid by the Contractor to the Owner upon demand.

In the event the Owner shall determine to complete the Work without calling upon the Contractor's surety to do so, the Contractor shall not be entitled, from and after the effective date of the declaration of the default, to receive any further payment under the Contract until the said Work shall be wholly completed and accepted by the Owner.

In case the Owner shall declare the Contractor in default as to a part of the Work only, the Contractor shall discontinue such part, shall continue performing the remainder of the Work in strict conformity with the terms of the Contract, and shall not hinder or interfere with any other contractors or persons whom the Owner may engage to complete the Work as to which the Contractor was declared in default.

The provisions relating to declaring the Contractor in default as to the entire Work shall be equally applicable to a declaration of partial default, except that the Owner shall be entitled to utilize for completion of the part of the Work as to which the Contractor was declared in default such plant, materials, equipment, tools, and supplies as the Owner may direct.

In completing the whole or any part of the Work, the Engineer and the Owner shall have the power to depart from or change or vary the terms and provisions of the Contract, provided, however, that such departure, change or variation be made for the purpose of reducing the time or expense of such completion. Such departure, change or variation, even to the extent of accepting a lesser or different performance, shall not affect the conclusiveness of the Engineer's certificate of expense to any action to recover the amount by which such certificate exceeds the amount which would have been payable to the Contractor hereunder but for his default.

GP-5.03. CONTRACTOR PERFORMANCE FOLLOWING DEFAULT

Notwithstanding Owner's declaration of Contractor to be in default of the Work pursuant to GP-5.02, whether such declaration is in-whole or in-part, Contractor, with the written concurrence of Owner, or at the written direction of Owner, may perform mutually agreed upon Work for the benefit of the Owner, including, coordination of suppliers and/or subcontractors, completion of specified portions of the work in progress, and/or correction of defective and/or Guarantee Work. Such mutually agreed upon Work by Contractor shall not modify or supersede Owner's declaration of default, but shall be strictly for the purpose of limiting or reducing the default liability of Contractor to Owner. Contractor shall be paid as provided in the Contract Documents for Work satisfactorily performed pursuant to this GP-5.03.

GP-5.04. OWNER'S RIGHT TO TERMINATE CONTRACT FOR CONVENIENCE

Upon thirty days' written notice to the Contractor and the Engineer, the Owner may without cause and without prejudice to any other right or remedy, elect to abandon the Work and terminate the Agreement. In such event, the Contractor shall be paid for Work executed and expenses sustained plus a reasonable profit.

GP-5.05. NO WAIVER OF RIGHTS

Neither the inspection by the Engineer, Owner, or any of their respective employees or agents, nor any order of the Owner for payment of money, nor any order, measurement or certificate by the Engineer, nor payment for, nor acceptance of the whole or any part of the Work by the Engineer or Owner, nor any extension of time, nor any possession taken by the Owner or its employees or agents shall operate as a waiver of any provision of this Contract, or of any power herein reserved to the Owner or of any right to damages herein provided, and no waiver of any breach of this Contract shall be held to be a waiver of any other subsequent breach. All remedies provided in this Contract to the Owner shall be construed as cumulative, i.e., in addition to each and every other remedy herein provided, and the Owner shall have any and all equitable and legal remedies which it would in any case have.

SECTION 6

INSPECTION OF WORK

GP-6.01. OWNER'S REPRESENTATIVE

The Engineer will be the Owner's representative during the construction period. A representative of the Engineer will make visits to the Site to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in substantial compliance with the Contract Documents. The Engineer will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of the on-site observations, the Engineer will keep the Owner informed of the progress of the Work and will endeavor to guard the Owner against defects and deficiencies in the Work of Contractors. The Engineer may disapprove Work as failing to conform to the Contract Documents. Whenever the Engineer considers it necessary or advisable for the proper carrying out of the intent of the Contract Documents, the Engineer shall have authority to require the Contractor to make special examination or testing of the Work (whether or not fabricated, installed or completed).

No matter how extensive or intensive the Engineer's inspection, the Engineer will not have any duty or obligation with reference to and will not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, and will not be responsible for the Contractor's failure to carry out the Work in substantial compliance with the Contract Documents. The Engineer's duties, services, and work shall in no way supersede or dilute the Contractor's obligation to perform the Work in conformance with all contract requirements. The Engineer is empowered when directed by the Owner to act on its behalf with respect to the proper execution of the Work and to give instructions when necessary to require such corrective measures as may be necessary in the Engineer's professional opinion to endeavor to protect the Owner's interest.

The Engineer is empowered to determine the amount, quality, acceptability, and fitness of all parts of the Work, to interpret the Contract Documents, to waive provisions of the Specifications to meet unforeseen conditions or circumstances revealed or arising during the course of the Work, and to decide all other questions in connection with the Work, but this authority shall not give rise to any duty or responsibility of the Engineer to the Contractor, the subcontractor, or any of their agents or employees to do so.

GP-6.02. ACCESS TO WORK

The Owner, its Engineers, Inspectors, Agents, other employees, and any other parties who may enter into contracts with the Owner for doing work within the territory covered by this Contract shall, for all purposes which may be required by their contracts, and representatives of State and Federal regulatory agencies shall for any purpose have access to the Work and the premises used by the Contractor, and the Contractor shall provide safe and proper facilities therefore. The Contractor shall, whenever so requested, provide to the Engineer access to the proper invoices, bills of lading, etc., and shall provide scales and assistance for measuring and testing any of the materials.

GP-6.03. COVERING OF WORK

No backfilling or covering of underground Work or covering of Work in structures shall be done without authorization by the Engineer. Any Work covered without such authorization shall be uncovered to such extent as directed or removed and replaced by the Contractor at its expense. If covering of the Work is ordered stopped, no more Work shall be done until such order is withdrawn.

SECTION 7

CONTRACTOR'S STATUS

GP-7.01. REPRESENTATIONS OF THE CONTRACTOR

The Contractor represents and warrants:

(a) That it is financially solvent, that its financial condition is in all material respects the same as represented and certified at the time of bidding, and that it is experienced in and competent to perform the type of Work or to furnish the plant, materials, supplies or equipment, to be so performed or furnished by it; and

(b) That it is familiar with all Federal, State, County and Municipal laws, ordinances, and regulations which may in any way affect the Work or those employed therein including, but not limited to, any special acts relating to the Work or to the project of which it is a part; and

(c) That such temporary and permanent Work required by the Contract Documents as is to be done by it can be satisfactorily performed and constructed and used for the purpose for which it is intended and that such construction will not injure any person or damage any property; and

(d) That it has carefully examined the Contract Documents and the Site of the Work and that, from its investigations, it has satisfied itself as to the nature and location of the Work, the character, quality and quantity of surface and subsurface materials and structures likely to be encountered, the character of equipment and other facilities needed for the performance of the Work, the general and local conditions, and all other materials which may in any way affect the Work or its performance.

(e) The Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with each and every phase of the Work. The Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to all employees on the Work and any other persons who may be affected thereby.

GP-7.02. CONTRACTOR'S ADDRESS: NOTICES

Both the address given in the Bid upon which the Contract is founded and the Contractor's office at or near the Site of the Work are hereby designated as places to either of which notices, letters or other communications to the Contractor may be delivered. Notices to the Contractor may be given: 1) by personal delivery to any partner or officer of the Contractor, or, to the Contractor if a sole proprietor, or to any authorized representative of the Contractor, or, 2) by depositing in a postpaid wrapper directed to either of the places above designated in any post office box regularly maintained by the U.S. Postal Department, or, 3) by registered mail, certified mail, postage paid, return receipt requested, or, 4) by facsimile followed by regular mail, or, 5) by nationally recognized overnight courier (against receipt), or, 6) by telegraph. The date of service shall be the date of such delivery or mailing. The first named address may be changed at any time by an instrument in writing executed by the Contractor and delivered to the Owner.

Nothing herein contained shall be deemed to preclude or render inoperative the service of any notice, letter, or other written communication upon the Contractor or his authorized representative personally.

GP-7.03. SUPERVISION AND SUPERINTENDENCE

The Contractor shall continuously supervise and direct the Work efficiently and with its best skill and attention. The Contractor shall have sole responsibility for the means, methods, techniques, sequences, and procedures of construction. The Contractor shall be responsible to see that the finished Work complies accurately with the Contract Documents.

The Contractor acknowledges and agrees that it is fully responsible for the safety, supervision and control of the Work and of Contractor's agents, employees, subcontractors and suppliers and that the Owner and its Officers, employees and agents have no obligation with respect to supervision of Contractor's employees, agents, subcontractors or suppliers and the manner in which the work is performed.

The Contractor shall at all times have a competent superintendent agreeable to the Owner on the Site of the Work who shall have full authority to act for the Contractor and who shall see that the Work under the Contract is executed in accordance with the Contract Documents. The superintendent shall be an authorized representative of the Contractor for the purposes of Section GP-7.02.

The Contractor shall be responsible for the acts of its agents, superintendents, and employees during the life of the Contract.

GP-7.04. CONTRACTOR'S EMPLOYEES

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

GP-7.05. CONTRACTOR'S RESPONSIBILITY AND LIABILITY FOR INJURIES TO PERSONS OR DAMAGE TO PROPERTY

The Contractor shall be solely responsible and liable for the safety and protection of property, including but not limited to, the premises, its appurtenances and equipment and for the safety and protection of all persons entering on, in or about the Site including, but not limited to, the employees of the Owner, Engineer, Contractor, or subcontractors. The Contractor shall be solely responsible for all physical injuries, including death, to any such persons and for all damage to any such property occurring on account of the Work under this Contract, whether or not due to the negligence, fault, or default of the Contractor, its officers, employees, or agents, or of a subcontractor, its officers, employees, or agents.

To the fullest extent permitted by the law of the State in which the work is performed the liability of the Contractor under this Contract shall be absolute and shall not be dependent upon any question of negligence on the Contractor's part or on the part of its officers, agents, servants, or employees. Neither the approval by the Engineer of the methods of doing the Work, nor the failure of the Engineer to call attention to improper or inadequate methods or to require a change in methods, nor the neglect of the Engineer to direct the Contractor to take any particular precautions or to refrain from doing any particular thing shall excuse the Contractor from its obligations hereunder in case of any such injury to person or damage to property.

The provisions of this paragraph are intended for the sole benefit and protection of the Owner and Engineer and shall not create any cause of action in favor of any person, corporation or entity, other than the Owner and Engineer.

GP-7.06. CONTRACTOR'S DUTY OF INDEMNIFICATION

The Contractor shall fully protect, defend, indemnify, and save harmless the Owner and the Engineer, their officers and agents, against all liability, judgments, costs, damages and expenses, including reasonable attorneys' fees, upon any claims for injuries to, or death of, any persons or damage to any property occurring on account of the Work hereunder, whether such damages or injuries to be attributable to the negligence of the Contractor, its officers, employees, agents, the Owner, Engineer, or others, provided, however, where such indemnification is precluded by statute, this clause shall not be deemed to provide indemnity to the Owner or Engineer to the extent that such liability, judgements, costs, damages and expenses are attributable to the negligence of the Owner or Engineer.

The Contractor shall fully protect, defend, indemnify, and save harmless the Owner and the Engineer against all liability judgments, costs, damages, and expenses, including without limitation reasonable attorneys' fees, upon all claims relating to labor and material furnished in connection with the Work hereunder or on account of the

failure, omission, or neglect of the Contractor or its Subcontractors, their officers, employees, or agents to do or perform any of the covenants, acts, matters, or other duties required by this Contract.

The provisions of this Section GP-7.06 shall not be deemed to provide indemnity of the Engineer for the liability of the Engineer, its agents or employees, to the extent that the liability of the Engineer, its agents or employees arises out of (a) or (b) below.

(a) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs, or specifications, or

(b) the negligent giving or failure to give, directions or instructions required by this contract or statute of the Engineer, its agents or employees as part of the Work, where such giving or failure to give directions or instructions, is the primary and principal cause of the bodily injury or property damage.

GP-7.07. CLAIMS

If the Contractor claims: 1) that any Work it has been ordered to do is extra work, or 2) that it has performed or is going to perform extra work, or 3) that any action or omission of the Owner or the Engineer is contrary to the terms and provisions of the Contract, it shall:

(a) Promptly comply with such order;

(b) File with the Owner and the Engineer within ten working days after being ordered to perform the Work claimed by it to be extra work or within ten working days after commencing performance of the extra work, whichever date shall be the earlier, or within ten working days after the said action or omission on the part of the Owner or the Engineer occurred, a written notice of the basis of its claim and a request for a determination thereof;

(c) File with the Owner and the Engineer, within thirty calendar days after said alleged extra work was required to be performed or said alleged extra work was commenced, whichever date shall be earlier, or said alleged action or omission by the Owner or the Engineer occurred, a verified detailed statement, with documentary evidence, for the items and basis of its claim;

(d) Produce for the Owner's examination, upon notice from the Owner, all of the Contractor's and its subcontractors' (of any tier) books of account, bills, invoices, payrolls, subcontracts, time books, progress records, daily reports, bank deposit books, bank statements, checkbooks, and canceled checks showing all of its actions and transactions in connection with, or relating to, or arising by reason of, its claim, and submit itself, persons in its employment, and persons in its subcontractor's employment for examination under oath by any person designated by the Owner to investigate any claims made against the Owner under the Contract, such examination to be made at the offices of the Owner or the Owner's agent;

(e) Proceed, prior to and subsequent to the determination of the Owner with respect to any such disputed matter, with the performance of the Contract diligently and in accordance with all instructions of the Owner and the Engineer.

The Contractor's failure to comply with any or all of the foregoing provisions of this Section shall be deemed to be: 1) a conclusive and binding determination on its part that said order, work, action, or omission does not involve extra work and is not contrary to the terms and provisions of the Contract; and 2) a waiver by the Contractor of all claims for additional compensation or damages as a result of said order, work, action or omission.

No person shall have power to waive or modify any of the foregoing provisions. In any action against the Owner to recover any sum in excess of the sum certified by the Owner to be due under or by reason of the Contract, the Contractor must allege in its complaint and prove at the trial compliance with each and all the provisions of this Section.

Nothing in this Section shall in any way affect the Owner's right to obtain an examination before trial or a discovery and inspection in any action that might be instituted by, or against, the Owner or the Contractor.

GP-7.08. NO CLAIMS AGAINST INDIVIDUALS

No claim whatsoever shall be made by the Contractor against any trustee, beneficiary, officer, agent, or employee of the Owner for, or on account of, anything done or omitted to be done in connection with the Contract.

This Section shall also apply with equal force and effect to the directors, officers and employees of the Engineer provided, however, that this Section shall not apply to partners or other persons who by law would be liable for the acts of the legal entity, whether the Owner or Engineer, it being the intent of this Section that claims against the legal entity itself shall not be precluded.

GP-7.09. SAFETY AND PROTECTION

In addition to the published safety rules and practices of the Owner, if any, applicable to activities at the Site the Contractor shall comply with all applicable laws, ordinances, rules, regulations, and orders of public bodies having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss, including, without limitation, the Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596), as amended, and under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54) and the Labor Laws of the State within which the project is located and the codes, rules and regulations promulgated therewith and all amendments or successor statutes or regulations to any of the foregoing. The Contractor shall erect and maintain as required by the conditions and the progress of the Work, all necessary safeguards for safety and protection and shall comply with all applicable recommendations of the Manual of Accident Prevention in Construction of the Associated General Contractors of America, Inc.

In compliance with the foregoing the Contractor shall have on site while any work is being performed an appropriately trained, responsible member of its organization whose duty shall be compliance with the above referenced laws, ordinances, rules, regulations and orders and the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated in advance in writing by the Contractor to the Owner.

The Contractor shall be responsible for developing, adopting and enforcing a project specific health and safety plan. The Contractor may not use any health and safety plan provided by Owner or Engineer as a substitute for conducting a full independent analysis of the materials, substances, equipment and conditions to be encountered during the project or as part of Contractor's work. The Contractor shall be responsible for determining and applying the most current applicable codes, rules, regulations and generally accepted standard of practice for each element of Contractor's health and safety plan. The Contractor shall not be permitted to rely on any project health and safety plan provided by Owner or Engineer.

The Contractor shall be responsible for providing to all its employees, agents and subcontractors or any other person under its control all safety equipment including but not limited to, hard hats, safety helmets, safety eye wear, respirators, and protective clothing required by law and the project specific health and safety plan, and shall be responsible for insuring the proper use thereof.

The Contractor shall place a post adjacent to the principal entry point into each excavation. Following each inspection of the excavation as required by 29 CFR 1926 (Subpart P) the Contractor shall prominently post in a manner protected from loss or damage by weather or other conditions, a certification of inspection. Such certification shall be 8 □" x 11" and shall be headed

"Excavation Safety Inspection"

and shall set forth in letters and figures at least 2 inches high and □ inch in thickness the time and date of the last inspection of the excavation. The certification shall also state that no evidence was found on inspection of: 1) a situation that could result in possible cave ins, 2) indication of failure of protective systems, 3) hazardous atmospheres, or 4) other hazardous conditions. The certification shall be signed by a competent person (as defined in 29 CFR 1926.650).

The duties, responsibilities and liability of the Contractor as set forth herein shall be deemed incorporated in and applicable to each and every separate division, section and provision of the Contract Documents as if set fort fully therein.

The Contractor shall keep upon the Site, at each location where Work is in progress, a completely equipped first-aid kit and stretcher and shall provide ready access thereto at all times when personnel are employed on the Work.

The Contractor alone shall be responsible for the safety, efficiency, and adequacy of his plant, appliances and methods.

GP-7.10. EMERGENCIES

In emergencies affecting the safety of persons on the Work or property at the Site or adjacent thereto, the Contractor, without special instruction or authorization from the Engineer or Owner, shall act, at its discretion, to prevent threatened damage, injury or loss. It shall give the Engineer prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused thereby. If the Contractor believes that additional Work done by it in an emergency which arose from causes beyond its control entitles it to an increase in the Contract price or an extension in the Contract time, it shall make claim as provided for in this Contract.

GP-7.11. PATENTS AND LICENSING AGREEMENTS

The Contractor shall protect, defend, indemnify, and save harmless the Owner and Engineer from all liabilities, judgments, costs, damages, and expenses which may in any way come against either of them by reason of the use of any material, machinery, devices, equipment, software or processes furnished or used in the performance of the Work for which patents or licensing agreements exist or by reason of the use of designs furnished by the Contractor for which patents or licensing agreements exist.

In the event that any claim, suit, or action at law or in equity of any kind whatsoever is made or brought against the Owner involving any such patents or licensing agreements, the Owner shall have the right to retain from the money due and to become due the Contractor a sufficient amount of money as shall be considered necessary by the Owner to protect itself against loss until such claim, suit, or action shall have been settled and evidence to that effect shall have been furnished to the satisfaction of the Owner.

GP-7.12. CONTRACTOR TO CHECK CONTRACT DOCUMENTS

The Contractor shall verify all dimensions and quantities in the Contract Documents. Any discrepancies found between the Contract Documents and Site conditions or any errors or omissions found shall be immediately reported to the Engineer, who shall promptly correct such error or omission in writing. Any Work done by the Contractor after its discovery of such discrepancies, errors, or omissions shall be done at the Contractor's sole risk and expense.

SECTION 8

SUBCONTRACTS AND ASSIGNMENTS

GP-8.01. ASSIGNMENT

The Contractor shall not assign, transfer, convey, or otherwise dispose of this Contract, or any portion thereof, or of its right, title, or interest therein, or its power to execute such Contract, to any other person or corporation without the previous consent in writing of the Owner.

The provisions of this Section shall not hinder, prevent, or affect an assignment by the Contractor for the benefit of creditors made pursuant to law, nor is it intended to prohibit subcontracting a portion of the Work of the Contract in accordance with the provisions of law and this Contract.

GP-8.02. SUBCONTRACTS

In the event that the Contractor desires to subcontract any part of the Work, it shall first submit to the Engineer a statement showing the character and amount of the Work to be subcontracted and the party to whom it is proposed to subcontract the same. Submission of said statement shall be 30 days prior to the time the Contractor plans to actually employ the proposed subcontractor. The Contractor shall also furnish a statement as to the proposed subcontractor's experience, financial ability, or other qualifications for properly performing the Work proposed to be subcontracted. In the event that the Owner or the Engineer objects for any reason to the Contractor contracting with a particular Subcontractor, the Owner or the Engineer shall provide the Contractor with notice of the same within ten (10) business days after submission by the Contractor to the Owner and the Engineer of the name and qualifications of such Subcontractor. The Contractor shall not contract with any such Subcontractor and shall promptly provide the Engineer with the name, experience, financial ability and other qualifications of a substitute Subcontractor.

The Contractor warrants that all subcontractors selected by it are financially able, sufficiently experienced, and otherwise qualified to perform the work of their subcontracts.

The Contractor shall be solely responsible for the acts or defaults of subcontractors and of such subcontractors' officers, agents and employees each of whom shall, for this purpose, be deemed to be the agent or employee of the Contractor to the extent of its subcontract.

The Contractor shall be fully responsible for the administration, integration, coordination, direction, safety practices and supervision of all of its subcontractors.

No subcontractor shall be permitted to work at the Site unless it furnishes and maintains the insurance required by this Contract. Certificates of Insurance shall be provided to the Owner, prior to admission of each subcontractor to the site.

The Contractor shall execute with each of its subcontractors and all subcontractors shall execute with their sub-subcontractors a written agreement which shall bind the latter to the terms and provisions of this Contract insofar as such terms and provisions are applicable. The Contractor and all subcontractors and sub-subcontractors shall promptly, upon request, file with the Owner a conformed copy of such agreements, from which the price and terms of payment may be deleted.

If, at any time during the progress of the Work to be performed, the Owner decides that any subcontractor of any tier is incompetent, careless or uncooperative, the Engineer as directed by the Owner will notify the Contractor accordingly and immediate steps will be taken by the Contractor for cancellation of such subcontract. Such termination, however, shall not give rise to any claim by the Contractor or by such subcontractor for loss of prospective profits on work unperformed or work unfinished, and a provision to that effect shall be contained in all subcontracts.

No provisions of this Contract shall create or be construed as creating any contractual relation between the Owner and any subcontractor or sub-subcontractor or with any person, firm or corporation employed by, contracted with or whose services are utilized by the Contractor.

The divisions or sections of the Contract Documents are not intended to control the Contractor in dividing the work among subcontractors or to limit the work performed by any trade.

The Owner reserves the right to limit the total amount of subcontracts to fifty percent (50%) of the total contract price.

SECTION 9

CHANGES

GP-9.01. OWNER'S CHANGES IN THE WORK

(a) The Owner at any time may make changes in the Work of the Contract by making alterations therein, by making additions thereto, or by omitting Work therefrom, and no such action shall invalidate the Contract, relieve or release the Contractor from any guarantee under the Contract, affect the terms or validity of any bond, relieve or release any Surety, or constitute grounds for any claim by the Contractor for damages or loss of anticipated profits. If changes in work exceed 20% of the Contract, notice must be given to Surety. All Work required by such alterations, additions, or omissions shall be executed under the terms of the Contract not withstanding the extent thereof. Said changes alterations, additions or omissions shall not constitute a cardinal change in the Contract.

(b) Other than in an emergency endangering life or property or pursuant to a Field Order, the Contractor shall not make any change in the Work nor furnish any labor, equipment, materials, supplies, or other services in connection with any change except pursuant to, and after, receipt of a written authorization from the Owner in the form of a Change Order, Modification, or Proceed Order. The Contractor shall not be entitled to any increase in the Contract price or extension of the Contract time, and no claim therefor shall be valid, unless such written authorization has been so issued to the Contractor, by the Owner.

(c) The Engineer may authorize minor changes in the Work which do not alter the character, quantity, or cost of the Work as a whole. These changes may be accomplished by a Field Order. The Contractor shall carry out such Field Orders promptly and without any adjustment of the Contract price or Contract time.

GP-9.02. ADJUSTMENTS IN PRICE

Any increase or decrease in the Contract price resulting from changes in the Work ordered by the Owner shall be determined as provided in this Section:

(a) By such applicable unit prices, if any, as set forth in the Contract; or

(b) If no such unit prices are so set forth, then by unit prices or by a lump sum mutually agreed upon by the Owner and the Contractor; such unit prices or lump sum being arrived at by estimates of reasonable value prepared in general conformance with the outline set forth in (c) below.

(c) If no such unit prices are so set forth and if the parties cannot agree upon unit prices or a lump sum, then determination shall be made as the sum of the following amounts for all Work necessary for the changes:

(1) Cost of materials delivered to the job Site for incorporation into the Contract Work.

(2) Wages paid to workmen and foremen and wage supplements paid to labor organizations in accordance with current labor agreements.

(3) Premiums or taxes paid by the Contractor for workmen's compensation insurance, unemployment insurance, FICA tax and other payroll taxes as required by law.

(4) Sales and use taxes paid as required by law.

(5) Allowances for necessary use of construction equipment (exclusive of hand tools and minor equipment), as approved by the Engineer.

(6) An amount for overhead.

(7) An amount for profit.

Construction equipment rental rates shall be in accordance with those published in that issue of the Associated Equipment Distributors (AED) Rental Guide, current at the time the work is done. In the event that rental rates for equipment used in the performance of extra work are not listed in the AED Rental Guide, rental rates will be approved for payment which are consistent with those prevailing in the construction industry in the area of the Work. Monthly, weekly, or daily rates shall apply, prorated to the actual time the equipment is in use; the classification of monthly, weekly, or daily rate to be used shall be determined by the length of time the piece of equipment under consideration was in use on the total project under Contract plus either the time used in the performance of the extra work or the time used in the performance of the extra work plus additional subsequent time used on the total project under contract. Gasoline, oil and grease required for operation and maintenance will be paid for at the actual cost. When, in the opinion of the Contractor as approved by the Engineer, suitable equipment is not available on the Site, the moving of said equipment to and from the Site will be paid for at actual cost.

The Contractor shall submit evidence satisfactory to the Engineer to substantiate each and every item included in an estimate prepared pursuant to GP-9.02 (b) or a determination pursuant to GP-9.02 (c).

The amounts allowed for overhead and profit for a change resulting in an increase in Contract price may be less than, but shall not exceed, the applicable percentages as follows:

(a) For work done directly by the Contractor, the sum of overhead amount plus profit amount shall not exceed 20% of the cost.

(b) For work done by subcontractors of any tier, the sum of total overhead amounts of the subcontractors and Contractor, plus total profit amounts for the subcontractors and Contractor, shall not exceed 25% of the cost. Subcontractors shall be limited to 15% and Contractors shall be limited to 10% for combined overhead and profit.

Overhead is defined as all expense not included in the amounts outlined in GP-9.02 (c) (1) through GP-9.02 (c) (5), including administration, superintendence, insurance not outlined in GP-9.02 (c) (1) through GP-9.02 (c) (5), material used in temporary structures, additional premiums placed upon the labor and performance bonds of the Contractor and small hand tools.

Where Work necessitated by the change involves overtime, no payroll taxes, overhead or profit will be allowed on the premium portion of overtime pay.

GP-9.03. PROCEED ORDER

If the Owner and the Contractor cannot agree upon an equitable adjustment of the Contract price prior to performance of the change in the Work, a Proceed Order will be issued authorizing the change, and Contractor shall proceed with the work thereof by the most economical methods. Upon completion of the change in the work and a determination of the adjustment in the Contract price, a Change Order will be issued.

GP-9.04. EXTRAS BY CONTRACTOR

Extras for Increase in Contract Price: If the Contractor claims that any instructions given to him by the Owner or Engineer, by the drawings or otherwise, involve extra Work not covered by the Contract, then, except in emergencies endangering life or property, the Contractor shall give the Owner written notice thereof before proceeding to execute the Work. Said notice shall be given promptly enough to avoid delaying the Work and in no instance later than 10 days after the receipt of such instructions. Should it not be clear to the Contractor that a change will involve extra Work, written notice given within 10 days that the change may involve extra Work will be considered sufficient notice. If the Owner agrees that the Work involved in such instruction was extra work, a change order shall be issued as provided in GP 9.02 of these General Provisions, and the additional compensation to be paid therefore shall be determined by one of the three methods provided in said GP 9.02, selected by the Owner. Except as otherwise specifically provided, no claims for extra Work shall be allowed unless the notice required by this Section is given by the Contractor within the time allowed and unless such Work is performed pursuant to the written order of the Owner as provided in said GP 9.02. The Owner's written order shall designate which of the three methods for computing charges and credits set forth in GP 9.02.

SECTION 10

CORRECTION AND GUARANTEE OF WORK

GP-10.01. CORRECTION OF WORK PRIOR TO ACCEPTANCE

If the Work, or any portion thereof, is damaged or defective in any way or if defects not readily detected by inspection develop before acceptance of the Work, the Contractor shall forthwith remove and replace, without additional compensation, such damaged or defective work. This requirement to remove and replace is notwithstanding that the Work may have previously passed the prescribed inspections and tests.

If the Contractor shall fail to replace any defective or damaged work within thirty days following written notice from the Engineer, or such other period of time designated by written notice from the Engineer, the Owner may cause such Work, material or equipment to be replaced; the expense thereof shall be charged to the Contractor and the amount deducted from any monies due or to become due the Contractor.

Any materials brought upon the Site which shall be rejected by the Engineer as not in conformity with the Contract Documents shall be removed immediately by the Contractor from the Site of the Work and replaced with materials complying with the Contract Documents without any additional costs or expense to the Owner.

Failure or omission on the part of the Engineer or any of its assistants or agents to reject defective or inferior work, material, or equipment, shall not release the Contractor from the obligations of tearing out, removing, and properly replacing the defective or inferior Work, materials, or equipment at Contractor's sole cost and expense at any time, upon the discovery of said defective or inferior work, material or equipment, prior to the written acceptance of the Work under this Contract, notwithstanding that such Work, material, or equipment may have been estimated for payment or that partial payments have been made on the same.

GP-10.02. CORRECTION OF WORK AFTER ACCEPTANCE

Any Work requiring rebuilding or replacement, as set forth in the subsection entitled "Guarantee", will be brought to the attention of the Contractor by written notice. The Contractor shall, within five days of such written notice, advise the Owner of his schedule for the timely rebuilding or replacement of such Work. Thereafter, such rebuilding or replacement shall be accomplished in accordance with said schedule.

GP-10.03. ACCEPTANCE OF UNCORRECTED WORK

If, instead of requiring correction or removal and replacement of Work which deviates from the Contract, the Owner may choose to accept it. In such case, a Change Order shall be issued with appropriate reduction in the Contract price as set forth in General Provisions Section entitled Deductions for Uncorrected Work.

GP-10.04. GUARANTEE

The Contractor guarantees the Work under the Contract against any and all defects in workmanship and materials for a period of one year following the date of Substantial Completion of the Work or the date of Beneficial Occupancy of that portion of the completed Work where Beneficial Occupancy may have occurred whichever shall later occur. Specific items of work and/or equipment may require extended warranty (beyond one year), the duration and terms of which shall be as specified in the Technical Specifications.

Pursuant to this guarantee, the Contractor agrees to make good, without delay and at its expense, any and all failures of any parts due to faulty materials, construction, or installation, or to the failure of any equipment to perform successfully within the limits prescribed by the Specifications; in addition, the Contractor shall make good any damage or injury to any other part of the Work caused by such failure of parts or equipment (Guarantee Work). Notwithstanding this provision, Owner may elect to apply the provisions of Sections 10.03 "Acceptance of Uncorrected Work" and 11.09 "Deduction for Uncorrected Work" to Guarantee Work.

Where the total value of all replacement or rebuilding required during the guarantee period is equal to or less than $5,000 or such other value as may be stated in the Special Provisions, the guarantee period shall terminate at one year following the later to occur of the date of Substantial Completion or Beneficial Occupancy. Where the total value of said replacement exceeds $5,000 or such other value as may be stated in the Special Provisions, the guarantee period for the total replacement or rebuilding shall be extended to a date one year following the date of completion of the rebuilding or replacing of the last item which failed.

The guarantee period for minor items contained on the Estimate of Work Remaining shall terminate at a date one year following the date of Substantial Completion, provided that completion or correction by the Contractor occurs within 6 months of the date of Substantial Completion. However, in the event of failure of a minor item or items following completion or correction of said minor items, the value of subsequent replacement or rebuilding of such item or items shall be included in the total value of all replacement or rebuilding for determining an extension of the guarantee period as set forth in the previous paragraph.

The Contractor shall furnish such labor and equipment as the Engineer may require to facilitate any one-year inspections of the Project at such times as shall be determined by the Engineer or Owner.

The guarantee under this provision shall not impair or limit the other rights and remedies available to the Owner by contract, statute or common law.

SECTION 11

PAYMENTS AND COMPLETION

GP-11.01. ESTIMATED QUANTITIES

The Contractor agrees: 1) that it will make no claim of any nature against the Owner or Engineer because of a difference between the quantities for unit price items of Work actually furnished and the estimated quantities stated in the Bid even though the estimated quantities prove grossly different from the quantities actually used, and 2) that the quantity of any unit price item of Work may be increased or decreased as may be deemed necessary without alteration or modification of the Contract.

In the event that the quantities of various items actually used are either higher or lower than the quantities stated in the Bid, the Contractor agrees as follows:

(a) where the change in quantities for any item in the original bid does not exceed 15% of the original bid quantity, the applicable unit prices bid shall be the sole basis for computing payment.

(b) where the change in quantities for any item in the original bid exceeds 15% of the original bid quantity, the Owner may review the unit price for said item to determine if a new unit price should be negotiated.

GP-11.02. PRICES

The prices herein agreed to for the performance of the Work shown and as specified shall include not only the doing of the Work but also the furnishing of all labor, tools, and materials therefor, whether the same are required directly or indirectly, unless otherwise specified.

Where Work is to be measured for payment by units of length, area, volume, or weight (as stated in the Bid), only the net amount of Work actually done, as it shall appear in the finished Work and as measured only within the payment limits described in the Contract Documents or as is ordered, shall be paid for, local customs to the contrary notwithstanding.

Where a lump sum price is bid for an item in the Bid, the lump sum price shall be for the Work complete as described in the item and shall include the cost of all specified or implied equipment, materials, and labor incidental to the Work, complete and ready for service and in accordance with the Contract Documents.

GP-11.03. BREAKDOWN OF LUMP SUM ITEMS

At least ten days prior to the submission of its first application for a progress payment, the Contractor shall present to the Engineer for its review a detailed schedule showing the breakdown of all lump sum bid prices in the Contract. Such schedule shall contain the amount estimated for each part of the Work and an estimate of quantities for each part of the Work. Work to be performed by subcontractors shall be separately identified. Upon request of the Engineer, said schedule shall be apportioned by the Contractor for labor and for materials. Such schedule shall be revised by the Contractor until the same shall be satisfactory to the Engineer and shall not be changed after the Engineer has approved the same without the express written consent of the Engineer. The approved schedule will be used in the preparation of the current estimate but will not be considered as fixing the basis for additions to or deductions from the Contract.

GP-11.04. CURRENT ESTIMATES

The Owner will establish dates during the respective months of the Project on which the Owner will accept applications for payment.

At least ten days before each date set for consideration for payment, the Contractor shall submit to the Engineer for review an application for payment, filled out and signed by the Contractor and covering the Work

completed as of the date of the application, in satisfactory form and supported by such data as the Owner and Engineer may reasonably require.

The Engineer will, within ten days after receipt of each application for payment, either indicate in writing its recommendation of payment and present the application to the Owner or return the application to the Contractor, indicating in writing his reasons for not recommending payment. In the latter case, the Contractor shall make the necessary corrections and resubmit the application.

The Engineer's recommendation of any payment request shall constitute its advice to the Owner: that to the best of its knowledge, information, and belief, based on the Engineer's on-site observations of the Work in progress and on its reliance upon application for payment and supporting data, the Work has progressed to the point indicated; that the quality of the Work appears to be in substantial compliance with the Contract Documents (subject to any subsequent tests and qualifications stated in his final review); and that the Contractor is entitled to the payment of the amount recommended. However, by recommending any such payment, the Engineer shall not thereby be deemed to have represented that it made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, that it has reviewed the means, methods, techniques and sequences, or that it has made any examination to ascertain how or for what purpose the Contractor has used the monies paid or to be paid to the Contractor on account of the Contract price.

Where Work has been included in the current estimate recommended by the Engineer for payment, and where such Work is later found to be defective, and where such defective Work has not been corrected, the Engineer will recommend to the Owner that the value of such uncorrected Work be deducted from the amount due or to become due the Contractor.

The Engineer may decline to act upon requests for monthly payment if lists of vendors and subcontractors, shop drawings, samples, work schedules, instruction manuals, and breakdowns of lump sum bid items necessary for orderly prosecution of the Work, are not submitted as required.

GP-11.05. TITLE TO MATERIALS, EQUIPMENT AND SUPPLIES

The Contractor warrants and guarantees that it will have good title to all materials, equipment, and supplies delivered to the Site for use in the Work.

Title to all materials, equipment and supplies to be sold by the Contractor to the Owner pursuant to this Contract or to be installed or incorporated into the Project shall immediately vest in the Owner upon delivery of such materials, equipment and supplies to the Site and prior to their installation or incorporation into the Project. Such materials, equipment, and supplies shall then become the sole property of the Owner subject to the right of the Owner to reject the same as hereinafter provided. The Contractor shall mark or otherwise identify all such materials, equipment, and supplies as the property of the Owner. The Contractor, at the request of the Owner, shall furnish to the Owner such confirmatory bills of sale and other instruments as may be required by it, properly executed, acknowledged, and delivered, confirming to the Owner title to such materials, equipment, and supplies free of liens or encumbrances of any kind. In the event that, after title has passed to the Owner, any of such materials, equipment, and supplies are rejected as being defective or otherwise unsatisfactory, title to all such materials, equipment, and supplies shall upon such rejection re-vest in the Contractor, and the Contractor shall then replace the rejected material, equipment, and supplies with acceptable material, equipment, and supplies at no additional cost to the Owner.

Nothing in this Section is intended, or shall be construed, as relieving the Contractor from its obligations under this Contract, and the Contractor shall have the sole continuing responsibility to install the materials, equipment, and supplies purchased or furnished in accordance with the provisions of this Contract, to protect the same, to maintain them in proper condition, and to forthwith repair, replace, and make good any damage thereto or loss thereof, without cost to the Owner until such time as the Work covered by the Contract is accepted by the Owner in accordance with Section GP-11.13.

The Contractor warrants and guarantees that no materials, equipment, or supplies delivered to the Site for use in the Work will have been acquired by the Contractor (or any other person performing work at the Site or

furnishing materials, equipment or supplies for the project) subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller (or otherwise imposed on the Contractor by any person).

GP-11.06. PAYMENTS FOR MATERIALS DELIVERED TO SITE

In making estimates of the value of the Work done and materials incorporated in the Work, the Contractor may, subject to the approval of the Owner or as required by law, include in the current estimates the delivered cost, as modified below, of equipment and non-perishable materials which have been tested for adequacy and which have been delivered to the Site and adequately protected from fire, theft, vandalism, the effect of the elements, and any damage whatsoever, or similarly placed in approved storage facilities adjacent thereto. Such materials and equipment shall at all times be available for inspection by the Engineer and the Owner.

No progress payment shall, however, be made for said material and equipment until each of the following conditions has been fulfilled:

(a) The Contractor shall have furnished to the Engineer invoices establishing the value of the said materials and equipment with the full amount the Contractor agrees to pay the vendor. Such invoices shall be furnished at least ten days in advance of the date of preparation of monthly estimates as established by the Engineer.

(b) The Engineer shall have inspected said material and equipment and recommended payment therefor.

(c) The Contractor shall have furnished to the Owner the fire and other casualty insurance policies, as provided in this Contract and with the broad form extended coverage endorsement, for said material and equipment in an amount equal to 100% of the value thereof and which policies shall be maintained, at the sole cost and expense of the Contractor, until said material and equipment has been incorporated into the Project and which shall name the Owner as an additional insured and loss payee and shall also name the Engineer as additional insured.

Contractor shall submit with each application for payment, satisfactory evidence that all suppliers, materialmen and subcontractors have been paid all amounts previously invoiced with respect to their services and agreeing to defend and hold Owner harmless from any liens and encumbrances placed against the Project on account of Contractor's failure to promptly pay its suppliers, materialmen and subcontractors. Satisfactory evidence shall be: a canceled check in the correct amount and including identification of the invoice or invoices paid; a letter or telegram, from the vendor and signed by his properly authorized employee, stating the amounts and invoices that have been paid; or a receipted invoice. Neither the Owner nor the Engineer shall have an obligation to pay or see to the payment of money to a Subcontractor except as may otherwise be required by law.

Should the above evidence of payment not be furnished, the Engineer will recommend the deduction of any funds included in previous estimates for such materials and equipment for which said evidence has not been furnished from the current estimate or subsequent current estimates.

Any payment made for materials and equipment delivered will not relieve the Contractor of any responsibility for furnishing all the necessary equipment and materials required for prosecution of the Work in the same manner as if such payments had not been made.

GP-11.07. OWNER'S PAYMENT OF MONTHLY ESTIMATES

The Owner will, within thirty days of presentation to it of an approved application for payment (current estimate), pay the Contractor the approved amount of such estimate, which unless otherwise set forth in the special provisions, shall be less retainage of ten (10) percent.

In lieu of all or part of the cash retainage, the Owner may accept securities negotiable without recourse, conditions or restrictions, a release of retainage bond, or an irrevocable letter of credit provided by the Contractor. The Owner may accept only securities, bonds or instruments acceptable under the laws of the State where the Owner is resident and/or the work is performed in lieu of any or all of the cash retainage.

Acceptance by the Contractor of the monthly payment shall constitute its warranty that it will pay each of its subcontractors and vendors all monies due them as required by applicable State and Federal Laws and Regulations.

GP-11.08. OWNER'S RIGHT TO WITHHOLD PAYMENTS

The Owner may withhold from the Contractor so much of any approved payments due it as may in the judgment of the Owner be necessary to assure the payment of any claims, liens or judgments against the Contractor, resulting from performance or non performance of the Work of the Contract, which have not been suitably discharged. The Owner shall have the right as agent for the Contractor to apply any such amounts so withheld in such manner as the Owner may deem proper to satisfy such claims, liens or judgments. Such application of such money shall be deemed payments for the account of the Contractor.

The Owner may also withhold from the Contractor so much an amount of any payments due it as may in the judgment of the Owner be necessary:

(a) to protect the Owner from loss due to previous payment for Work subsequently found to deviate from the Contract requirements and which has not been corrected by the Contractor, and

(b) to protect the Owner from loss due to previous payment for materials and/or equipment delivered to the Site for which evidence of payment to vendors has not been furnished by the Contractor.

GP-11.09. DEDUCTIONS FOR UNCORRECTED WORK

If the Owner deems it expedient to accept uncorrected Work, the Contract price shall be decreased by an amount, determined by the Owner, which is equal to the difference in value of the Work as performed by the Contractor and the value of the Work had it been satisfactorily performed in accordance with the Contract, or which is equal to the cost of performing the corrective Work, whichever shall be the higher amount.

GP-11.10. SUBSTANTIAL COMPLETION

The Work of the Contract shall be deemed Substantially Complete when either of the following occurs:

(a) When the Work of the Contract is at least 99% complete as evidenced by a list of minor items to be completed with estimated value equal to or less than 1% of the value of the Contract payments as shown in current estimates of Work completed.

(b) When the Owner and Contractor reach mutual written agreement that the Work is Substantially Complete.

The Contract will be considered as a single unit for determination of Substantial Completion except as follows:

(a) Where a division of major parts of the Contract is set forth in the Special Provisions for purposes of separate determinations of Substantial Completion for each part.

(b) Where the Owner and Contractor reach mutual written agreement that a major part of the Contract can be separately determined to be Substantially Complete.

(c) Where part of the Work of the Contract has been previously accepted into Beneficial Occupancy.

The date of Substantial Completion shall be evidenced by a Certificate of Substantial Completion signed by the Contractor, Engineer, and Owner.

GP-11.11. FINAL INSPECTION AND CERTIFICATE OF SUBSTANTIAL COMPLETION

The Owner, Engineer, and Contractor will make an inspection of the Work as soon as possible after written notification by the Contractor to the Owner that, in the judgment of the Contractor, the Work is 99% complete, or after the Owner and Contractor mutually agree that the Work appears Substantially Complete (the "Final Inspection"). Following said Final Inspection the Engineer will advise the Contractor of remaining items to be completed or corrected to arrive at completion of the Work inspected.

When the remaining items of Work to be completed or corrected are of sufficiently reduced value that Substantial Completion is indicated, the Engineer will prepare a detailed estimate (hereinafter referred to as Estimate of Work Remaining) of the value of said items showing each item's separate value as well as the total value of all items. The Contractor shall endorse said Estimate as evidence of agreement.

Substantial Completion will be evidenced by a Certificate of Substantial Completion signed by the Contractor, Engineer, and Owner. The date of Substantial Completion shall be that date specified in the Certificate of Substantial Completion. The Estimate of Work Remaining will be attached to the Certificate of Substantial Completion.

GP-11.12. PAYMENT AT SUBSTANTIAL COMPLETION

The Application for Payment at Substantial Completion shall be in a form satisfactory to the Owner and shall be accompanied by the following documents:

(a) Certificate of Substantial Completion with Estimate of Work Remaining attached.

(b) A schedule endorsed by the Contractor showing time of completion of all remaining Work.

(c) An affidavit of the Contractor: 1) that the claims of all subcontractors, materialmen, laborers, and all other persons and parties furnishing labor and materials with respect to the Contract have been paid in full except as noted; 2) that the Contractor will pay in full the exceptions stated from the proceeds of this payment; and 3) that the Contractor acknowledges that the Owner has made this payment in reliance upon this affidavit.

(d) Releases or receipts evidencing payment of all liens which may have been filed as a result of the performance of the Work of the Contract.

(e) A written statement from Surety that the Labor and Material Bond and the Performance Bond, each in the amount of 100% of the value of the Contract, are in force and will remain in force for a period of one year following the date of Substantial Completion or such later date as may be established by an extension of the guarantee period.

GP-11.13. ACCEPTANCE OF WORK

Acceptance by the Owner of the Work of the Contract will occur on the dates as follows:

(a) The date of Substantial Completion specified in the Certificate of Substantial Completion for all Work not included in (b) or (c) below.

(b) The date of Beneficial Occupancy for all Work taken into Beneficial Occupancy.

(c) The date of payment of the requisition of the Contractor at the time of 100% completion (correction for all Work included in the Estimate of Work Remaining).

GP-11.14. CONTRACTUAL RELEASE TO OWNER

The submission by the Contractor of an Application for Payment at Substantial Completion shall be, and shall operate as, a release to the Owner of all further claims and liability to the Contractor for all things done or

furnished in connection with the Contract, and for every act and neglect of the Owner and others relating or arising out of the Contract excepting the Contractor's requests for payment for completion or correction of Work items included in the Estimate of Work Remaining, the Application for Payment at Substantial Completion, and interest on said Payment if payment is improperly delayed. However, no Application for Payment, or payment of same, shall operate to release the Contractor from any obligations under the Contract or the Surety bonds.

GP-11.15. PAYMENT FOR MINOR ITEMS WHEN COMPLETED OR CORRECTED

The minor items of Work contained in the Estimate of Work Remaining shall be completed or corrected by the Contractor in a timely manner in accordance with the schedule submitted with the application for Payment at Substantial Completion. Upon such completion or correction, and upon Application for Payment in a form satisfactory to the Owner, the Owner will pay an amount equal to the value, and only that value, of the item or items of Work completed or corrected. The remaining amount held as determined when making Payment at Substantial Completion will be retained by the Owner until the Contractor has completed all items of Work contained in the Estimate of Work Remaining and has submitted evidence that all claims, liens, and judgments have been satisfied. No payment will be made which is less than one thousand dollars, except upon 100% completion or correction of all items included in the Estimate of Work Remaining.

GP-11.16. FINAL PAYMENT (Affidavit)

The Contractor's application for final payment (constituting the entire unpaid balance of the Contract sum) upon 100% completion (correction of all items included in the Estimate of Work Remaining) shall be accompanied by an affidavit of the Contractor ("Contractor Affidavit") as follows:

(a) That in accordance with the provisions of the applicable law of the State, in which the work is performed and other applicable State and Federal laws and regulations, all claims, liens, and judgments with respect to the Contract have been paid in full;

(b) that the Contractor has no further claims with regard to the Contract against the Owner or its agents; and

(c) that the Contractor acknowledges that the Owner has made this Final Payment in reliance upon this affidavit.

GP-11.17. OWNER'S RIGHT TO COMPLETE THE CONTRACT

During the time period extending from the date of Substantial Completion to a date six months thereafter or to mutually acceptable later date, the Contractor shall complete or correct all items contained in the Estimate of Work Remaining in accordance with the schedule established at Substantial Completion as such Estimate of Work Remaining and Schedule may be modified or supplemented prior to the end of the warranty period. Where Work items are not completed or corrected in accordance with the established schedule, and following reasonable notice by the Owner to the Contractor, the Owner may complete or correct said Work items. The cost for such completion or correction may be paid by the Owner, without review by the Contractor, and the Contractor shall reimburse the Owner for all costs so incurred.

It is hereby mutually agreed that six months following the date of Substantial Completion or the mutually acceptable later date, and at any time thereafter, the Owner (having given prior notice as set forth in the preceding paragraph) may, without additional notice to the Contractor, complete and correct any items contained in the Estimate of Work Remaining which are remaining to be completed or corrected. The cost for such completion and correction may be paid by the Owner, without review by the Contractor, and the Contractor shall reimburse the Owner for all costs so incurred. In the event that the Owner commences legal proceedings to recover all costs not reimbursed, there shall be included as an item of damage all reasonable attorneys' fees.

Any funds previously held by the Owner at the time of payment at Substantial Completion may be applied by the Owner to offset the costs incurred for completion or correction of items contained in the Estimate of Work Remaining. All costs incurred by the Owner in excess of funds previously held will be billed to the Contractor, and the Contractor shall promptly reimburse the Owner for said costs. The Owner may add reasonable amounts for

administrative, engineering, and supervisory services to the cost of construction for those items completed or corrected by the Owner. In the event that the Owner commences legal proceedings to recover all costs not reimbursed, there shall be included as an item of damage all reasonable attorneys' fees.

GP-11.18. BENEFICIAL OCCUPANCY

The Owner reserves the right to accept for Beneficial Occupancy any portion of the Work, whether or not Substantially Complete, at anytime without prejudice to the Owner in enforcing any provisions of the Contract.

Beneficial Occupancy by the Owner shall occur when the Owner accepts a part of the Work, but not all Work of the Contract, and places such accepted Work in the service therefor intended.

Upon Beneficial Occupancy by the Owner the following procedures will apply:

(a) The Engineer, with the approval of the Owner, will notify the Contractor as to what portion, or portions of the Work have been accepted into Beneficial Occupancy.

(b) The retained percentage for the completed Work taken into Beneficial Occupancy will be released.

(c) The guarantee period applicable to that portion of the Work accepted into Beneficial Occupancy will start as of the date of Beneficial Occupancy.

(d) As of the date of Beneficial Occupancy, the Owner will assume responsibility for maintenance, heat, utilities, and insurance on that portion of the Work accepted for occupancy.

(e) The Contractor shall subsequently complete or correct all unfinished items in the Work accepted by the Owner for Beneficial Occupancy.

(f) Such action by the Owner will in no way affect the obligations of the Contractor under the terms and provisions of the Contract with respect to uncompleted Work.

(g) Upon completion of unfinished items in the Work beneficially occupied, sufficient to establish Substantial Completion as defined herein, all procedures set forth herein for Work deemed Substantially Complete shall apply.

GP-11.19. CONTRACTOR'S AUTHORITY TO SIGN

All Current Estimates, applications for payment, affidavits, and other documents required hereunder and the Certificate of Substantial Completion, shall be signed on behalf of the Contractor by a person evidencing its authority to do so and shall be acknowledged where required in form satisfactory to the Owner.

GP-11.20. CHARGES FOR DELAY CAUSED BY THE CONTRACTOR

It is hereby agreed that time is of the essence of the Contract with respect to the Work to be performed and that the Owner will suffer damages from failure to complete the Work in the time specified. When the Work embraced in the Contract is not 100% Completed on or before the date specified herein or on or before the later date to which the time of 100% Completion may have been extended in writing by the Owner, the engineering and inspection expenses incurred by the Owner, upon the Work from said date to the date of 100% Completion of the Work shall be charged to the Contractor and be deducted by the Owner from monies due the Contractor, and in addition, the Contractor shall be charged the liquidated damages stated in the Contract for the same period, said sums being not in the nature of a penalty, but a part of the consideration of the Contract.

The Owner shall have the right to deduct such amounts from any monies due or to become due the Contractor and the amount still owing, if any, after such deduction shall be paid on demand by the Contractor or its Surety. Such payment shall not relieve the Contractor or its Surety from any other obligation under this Contract.

GP-11.21. DELAYS CAUSED BY OTHERS

If the Contractor is unreasonably delayed at any time in the progress of the Work by any act, omission, or neglect of the Owner or Engineer, its agents or employees which are beyond their control, or if the Contractor is delayed at any time in the progress of the Work by any act, omission or neglect of any separate contractor engaged by the Owner, or by strikes, fires, unusual delays in transportation, abnormal adverse weather conditions or unavoidable casualties not caused by the Contractor, or by any other cause beyond the Contractor's control, the time for Substantial Completion or 100% Completion, as applicable, shall be extended for the length of time that the substantial Completion or 100% Completion of the Work was actually delayed thereby and the Contractor shall not be charged with liquidated or actual damages for the delay during the period of such extension nor shall the Contractor be due compensation for extended general conditions expense, other expense related to the delay, overhead, or profit for the period covered by such extension. No extension shall be granted unless the Contractor demonstrates a delay in the Substantial Completion or 100% Completion of the Work, as applicable, by showing a delay on the critical path of the CPM schedule.

GP-11.22. OWNER'S RIGHT TO ACCELERATE

If the Owner or Owner's Representative elects to direct the Contractor to accelerate the work at no additional cost to the Owner to eliminate delays pursuant to GP 11.20, the Contractor shall immediately implement the acceleration. Acceleration can be in the form of additional manpower, overtime and/or additional shift work or a combination thereof. If the Contractor refuses to immediately proceed with the directed acceleration, the Owner may exercise its right to declare the Contractor in default as stipulated in GP 5.02.

SECTION 12

INSURANCE AND BONDS

GP-12.01. INSURANCE

The Contractor at its expense shall procure and shall maintain the insurance required in this section and elsewhere in this Contract to be provided by the Contractor. The Contractor shall require each subcontractor to procure and maintain the insurance required by this Contract to be provided by subcontractors.

The contractor shall procure (in addition to the coverage required in other sections of this Contract):

(a) Workers' Compensation and Disability Benefits with coverage to the statutory limits as required by the laws of the state in which the project is located in sufficient limits to discharge obligations under all applicable state Workers' Compensation laws, and, where applicable, the United States Longshoremen and Harbor Workers Act, the Jones Act and Admiralty or Maritime Law.

(b) Employers Liability Insurance, including occupational disease coverage, in the amount of at least $1,000,000.

(c) Commercial General Liability Insurance providing coverage for the Contractor for legal liability and customarily covered expenses for bodily injury and property damage with respect to the Work under this Contract, including but not limited to liability for bodily injury and property damage: 1) arising out of operations performed for the Contractor by independent contractors or arising out of acts or omissions of the Contractor in connection with its general supervision of such operations (Contractors' Protective Liability Insurance), 2) occurring after operations have been completed or abandoned (Completed Operations Insurance), 3) arising, after physical possession of the products has been relinquished, 4) out of the Contractor's products or reliance upon a representation or warranty with respect thereto (Products Liability Insurance), and5) assumed under this Contract (Contractual Liability Insurance). This policy shall include coverage for explosion, collapse and underground operations (XCU hazards) and shall provide coverage in the amount of at least $1,000,000 per Occurrence, $3,000,000 in the General Aggregate, and $3,000,000 in the Products Completed Aggregate. This policy shall contain a per Project Aggregate Endorsement.

(d) Comprehensive Automobile Liability insurance providing coverage for the Owner and the Contractor for legal liability (and customarily covered expenses) for bodily injury and property damage arising out of the ownership, maintenance, operation, use, loading, or unloading owned, nonowned and hired automobiles. The policy shall provide coverage in the amount of at least $1,000,000 Combined Single Limit, and shall include the MCS-90 Sudden and Accidental Pollution endorsement.

(e) Owners protective liability insurance providing coverage for the Owner as the named insured for legal liability (and customarily covered expenses) for bodily injury and property damage arising out of the operations under this Contract performed for the Owner by the Contractor or any of its subcontractors or out of acts or omissions of the Owner in connection with the Owner's general supervision of such operations. The policy shall provide coverage in the amount of at least $2,000,000 Per Occurrence and $2,000,000 in the Aggregate.

(f) The Contractor shall obtain and maintain Builders Risk/Installation Floater insurance in a form acceptable to the Owner upon the entire Project for the full cost of replacement at the time of any loss. This insurance shall include as named insureds the Owner, Contractor, Engineer, and Subcontractor of any tier. This insurance shall insure against loss from the perils of fire and extended coverage, and shall include "all risk" insurance for physical loss or damage including without duplication of coverage at least: theft, vandalism, malicious mischief, transit, collapse, false work, temporary buildings, debris removal, flood, earthquake, testing and damage resulting from defective design, workmanship or material. This insurance shall not be restricted, canceled

or lapsed for reasons of occupancy. The limits of the coverage shall be at least equal to the full contract amount for the project.

(g) Umbrella Coverage/Excess Liability Insurance providing coverage for the Owner and the Contractor for costs in excess of the limits set forth in paragraphs (b), (c) and (d) above. This policy shall provide coverage in the amount of at least $5,000,000 Per Occurrence and $5,000,000 in the Aggregate. Owner reserves the right to increase or decrease the minimum limits depending on the project value and complexity.

Owner and Engineer shall be named as additional insureds on policies (c), (d), (f) and (g).

Each subcontractor shall provide (in addition to the coverage required in other sections of this Contract):

(a) Comprehensive General Liability Insurance providing coverage for the subcontractor in the form as hereinabove required of the Contractor including Contractors Protective Liability Insurance, Completed Operations Insurance, Products Liability Insurance, and Contractual Liability Insurance.

(b) Comprehensive automobile liability insurance providing coverage for the subcontractor as hereinabove required of the Contractor.

Each policy of insurance required under the Contract whether for Contractor or Subcontractor shall be issued by an insurance company approved by the Owner, authorized to issue such policy in the State in which the Project is located, shall be in form and content satisfactory to the Owner and its attorney, with a minimum of A-Best Insurance rating and shall provide: 1) that the policy shall not be changed or canceled until the expiration of thirty days after written notice to the Owner and Contractor, and 2) that it shall be automatically renewed upon expiration and continued in force unless the Owner and Contractor are given-thirty day□s written notice to the contrary, 3) that Contractor□s insurance shall be primary to any other coverage of Owner or engineer and, 4) that the insurer has agreed to waive rights of subrogation as the Owner and Engineer.

No Work shall be commenced under the Contract until the Contractor has delivered to the Owner proof of issuance of all policies of insurance required by the Contract to be procured by the Contractor. Before commencing any Work under the Contract, each subcontractor shall deliver to the Owner proof of the issuance of all policies of insurance required to be provided by the subcontractor. Nothing herein shall limit or substitute for the liability of Contractor for the liabilities of its subcontractors in connection herewith. The Contractor and subcontractors shall deliver to the Owner duplicate originals of each policy in which the Owner is named insured, certificates of all other insurance in such number as the Owner may require, and such alternate or additional proof of coverage as the Owner demands. The Contractor and each subcontractor shall from time to time upon the demand of the Owner promptly deliver to the Owner such proof of insurance as the Owner may require.

In the event of the failure of the Contractor to furnish and maintain such Insurance, Owner shall have the right to take out and maintain such insurance for and in the name of the Contractor, and the Contractor agrees to pay the cost thereof and to furnish all necessary information to permit Owner to take out and maintain such insurance for the account of the Contractor. Compliance by the Contractor with the foregoing requirements to carry insurance and furnish certificates shall not relieve the Contractor from liability under any provision of this Contract.

All liability insurance required by this Contract shall be maintained in force during the term of this Contract and until the later of one year after the date of final acceptance or one year after the Contractor or any subcontractor performs any Work under the Contract.

GP-12.02. ALTERNATIVE OR ADDITIONAL INSURANCE

If required by the Owner, the Contractor and any subcontractor shall provide any other alternative or additional insurance coverage, with appropriate additions or deductions from the Contract price to be made pursuant to the provisions applicable to change orders.

GP-12.03. SECURITY FOR FAITHFUL PERFORMANCE

Simultaneously with his delivery of the executed Contract, the Contractor shall furnish, in form satisfactory to the Owner, a performance bond and a labor and material bond, each in an amount at least equal to 100% of the accepted Bid, as security for faithful performance of this Contract and for the payment of all persons performing labor on the Project under this Contract and furnishing materials in connection with this Contract. The Surety company on each bond shall be duly authorized to do business in the State in which the Project is located and shall be satisfactory to the Owner. Each bond shall remain in force during the guarantee period provided in this Contract. The cost of these bonds shall be paid by the Contractor and shall be included in the Bid submitted.

GP-12.04. ADDITIONAL SECURITY

If, at any time, the Owner shall be or become dissatisfied with any Surety or Sureties then upon the Surety bonds, or if for any other reason such bonds shall cease to be adequate security to the Owner, the Contractor shall within five days after notice from the Owner to do so, substitute an acceptable bond in such form and sum and signed by such other Sureties as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Contractor. No payments on current estimates shall be deemed due or shall be made until the new Sureties shall have qualified.

Payment at Substantial Completion will be an amount equal to the value of all of the Work of the Contract which has been declared Substantially Complete including the estimated value of the minor items to be completed or corrected less an amount equal to twice the total Estimate of Work Remaining, less an amount withheld to satisfy any outstanding claims, liens, or judgments, less any charges for delay, and less all prior payments to or for the account of the Contractor. All prior estimates and payments including those related to Change Orders, shall be subject to correction by the payment at Substantial Completion.

SECTION 13

MATERIALS AND EQUIPMENT

GP-13.01. QUALITY AND WORKMANSHIP

All items of equipment and materials of like type furnished under one Contract shall be the product of one manufacturer, unless otherwise specified.

All materials furnished or incorporated in the Work shall be new, unused, of the best quality, and especially adapted for the service required; whenever the characteristics of any material are not particularly specified, such material shall be utilized as is customary in first class work of a nature for which the material is employed.

All materials and workmanship shall be subject to inspection, examination, and tests by the Engineer and other representatives of the Owner at any and all times during manufacture or construction and at any and all places where such manufacture or construction are carried on.

The selection of bureaus, laboratories, and agencies for the inspection and tests of supplies, materials, and equipment shall be subject to the approval of the Engineer. Satisfactory documentary evidence that the material has passed the required inspection and tests shall be furnished to the Engineer by the Contractor prior to the incorporation of the material in the Work.

All laboratory and field testing shall be at the sole cost and expense of the Contractor unless specifically stated otherwise in the Contract Documents.

GP-13.02. EQUIVALENT PRODUCTS AND CHANGES TO SPECIFICATIONS

The words "similar and equal to," "or equal," "equivalent," and such other words of similar content and meaning (hereinafter, "or equal") shall, for the purposes of this Contract, be deemed to mean similar and equivalent to one of the named products.

Whenever any product is specified in the Contract Documents by a reference to the name, trade name, make or catalog number of any manufacturer or supplier, the intent shall not be to limit competition, but to establish a standard of quality which the Engineer has determined is necessary for the project. If any product other than that specified is proposed for use by the Contractor, it shall submit to the Engineer either its certification that the "or equal" strictly conforms to the Specifications, or a statement specifically identifying all differences between the "or equal" and the Specifications. Any variation of a proposed "or equal" from the Specifications which is not specifically noted in the Shop Drawing or Contractor's submittal shall be at the sole risk and expense of Contractor. Engineer's review and stamping of Shop Drawings or Contractor submittals shall not be deemed to be, or constitute Engineer's acceptance of any such "or equals" or deviation from the Specifications which are not specifically noted on Contractor's submittal. In addition Contractor shall provide all the information that the Engineer requests concerning the product. The proposed product shall not be used until it is accepted by the Engineer. Any "or equal" incorporated into the Work without Engineer's written acceptance shall be at the Contractor's sole risk, and Engineer may require the removal and replacement of any unaccepted "or equal".

In all cases, the Engineer will be the sole judge as to whether a proposed "or equal" is acceptable, and the Contractor shall have the burden of proving, at its expense, to the satisfaction of the Engineer that the proposed "or equal" is similar and equal to the named product. In making such determination the Engineer may establish such criteria as it deems proper for acceptance of the "or equal".

Any requested change in the Specifications not pertaining to an "or equal" must be submitted to Engineer in writing and must be stated with sufficient clarity and detail to permit proper consideration by Engineer. Unless accepted by Engineer after submission as herein provided, any deviation from the Specifications, or the use of any product which varies from the Specifications, shall be at Contractor's sole risk and expense.

With respect to the acceptance or rejection of "or equals" by Engineer, neither the review and stamping of Shop Drawings and/or Contractor submittals as provided in Section GP-14.05, nor Engineer's failure to observe and note any variation from the Specifications (unless such variation is specifically noted and identified in Contractor's Submittal), shall reduce, transfer, or modify Contractor's responsibility to provide products which fully comply with the Specifications.

"Or equals" or changes to Specifications proposed by Contractor, which are judged by the Engineer to represent no-cost improvements or enhancements to the design, shall be reviewed without cost to Contractor. All other submissions of "or equals" or changes to the Specifications shall be considered after review of specific products submitted at the same time or earlier, and regardless of whether such "or equals" are accepted or rejected, Contractor shall reimburse Owner for the costs (including labor costs) and expenses of Engineer incurred in the review of "or equals" or changes to the Specifications, including the cost of Engineer's conflict review, and any revisions made as a result of such review, plus a 10% administrative charge. Contractor shall reimburse Owner for such sums upon demand.

Where the Engineer accepts an "or equal" by the Contractor and such "or equal" requires a revision or redesign of any part of the Work covered by the Contract, all such revision and redesign and all new drawings and details required therefor shall be acceptable to the Engineer and shall be provided by the Contractor at its expense. If an acceptable substitution of an "or equal" requires a different quantity or arrangement of duct work, piping, wiring, or any part of the Work from that in the Contract Documents, the Contractor shall provide the same at its expense.

GP-13.03. SUPPLIERS

All supplies and equipment shall be furnished by manufacturers who shall have at least three years' experience in the design, production, assembly, and field service of equipment of like type, size, and capacity. Where required by the Engineer, the Contractor shall supply a list of at least three successful installations.

GP-13.04. TOOLS, ACCESSORIES AND SPARE PARTS

The Contractor shall, unless otherwise stated, furnish with each type, kind, and size of equipment, one complete set of any special tools and appliances which may be needed to adjust, operate, maintain, or repair the equipment.

Each piece of equipment shall be provided with a substantial nameplate, which is securely fastened in place and clearly inscribed with the manufacturer's name, year of manufacture, and principal rating data.

Where the Technical Specification Sections of this Contract require spare parts to be furnished by the Contractor, said spare parts for each item of equipment shall be kept separate and tagged to identify the specific item of equipment to which they belong, shall be packaged so as to preclude damage from handling and storage, and shall be bagged or packaged together where items are small in dimension.

GP-13.05. EQUIPMENT INSTALLATION

The Contractor shall have on hand sufficient proper equipment and machinery of ample capacity to facilitate the Work.

The General Contractor shall furnish, install, and protect all necessary concrete pads, which shall include guides, track rails, bearing plates, anchor and attachment bolts, and all other appurtenances needed for the installation of the devices included in the equipment specified. The location, size and templates for the concrete pads shall be furnished by the Contractor supplying the equipment along with all guides, track rails, bearing plates, anchor and attachment bolts and other appurtenances required.

Anchor bolts shall be made of ample size and strength for the purpose intended. Unless otherwise specified, anchor bolts in submerged locations shall be bronze or stainless steel; all other anchor bolts shall be cadmium plated. Substantial templates and working drawings for installation shall be furnished.

All equipment shall be correctly aligned, leveled and adjusted for satisfactory operation and shall be installed so that proper and necessary connections can be made readily between the various units.

The Contractor shall furnish all oils and greases for initial operation of each item of equipment and shall furnish the lubricant chart as indicated in Paragraph GP-13.08. Insofar as possible, all lubricants shall be obtained from one manufacturer approved by the Owner. Each item of equipment shall be tagged to show the date lubricated, the name and type of lubricant used and the recommended frequency of lubrication.

All mechanical and electrical equipment shall be checked for correctness of installation by a qualified representative of the manufacturer, and the manufacturer shall certify in writing to the Engineer that the equipment was installed according to its specifications. Where multiple manufacturers have supplied components for a piece of equipment, the manufacturer that assembled the components shall supply the certification.

GP-13.06. OPERATING INSTRUCTIONS AND MANUALS

The Contractor shall furnish the services of qualified manufacturers' technicians to instruct designated employees of the Owner in the operation and care of all equipment. The Contractor shall also furnish and deliver to the Engineer three complete sets of instructions, bulletins; diagrams, and other data and information required for the proper operation and maintenance of the equipment, including spare parts lists and ordering of spare parts. These operating manuals shall be furnished to the Engineer at such time as the equipment is delivered and shall include references to models and serial numbers of equipment furnished, assembly drawings, lubrication instructions, and service recommendations. Such data shall be bound in booklet form for easy reference and shall be accompanied by a transmittal sheet listing an inventory of items included.

GP-13.07. STORAGE AND MAINTENANCE OF EQUIPMENT

Equipment containing moving parts or bearings which is subject to damage by exposure or improper storage shall be protected as set forth herein:

The Contractor shall require that the manufacturers of all equipment to be incorporated into the Work of this Contract supply detailed instructions concerning storage and maintenance required to maintain the equipment in good condition until it is placed in operation. These instructions shall be acceptable to the Engineer and shall be strictly enforced. Such acceptance shall not relieve the Contractor of its obligation to properly store and maintain the equipment.

Equipment which is intended for outdoor installation may be stored outside subject to and in accordance with the manufacturer's instructions. Equipment intended for indoor installation shall be stored in heated and ventilated warehouses or in heated and ventilated enclosures on the Site of the Work.

Equipment which is installed more than seven days prior to being placed in operation shall be protected in strict accordance with the manufacturers' recommendations and in a manner acceptable to the Engineer. Such protection, where dictated, shall consist of complete air-tight encapsulation with desiccants.

Equipment improperly stored or improperly protected after installation shall, at the Owner's option, be replaced by the Contractor at no cost to the Owner.

GP-13.08. LUBRICATION CHART AND LUBRICATION

The Contractor shall furnish the Owner a lubrication chart(s) for all equipment furnished or installed by the Contractor. The chart(s) shall include the following for each item of equipment:

- name of the item;
- location of the item;
- each point of lubrication on the item;

- for each point of lubrication, the identification of the lubricant recommended and the recommended frequency of lubrication.

The information on the chart(s) shall be developed from manufacturers' printed data or from manufacturers' specific recommendations.

The identification of the lubricant by manufacturer's name and product identification number (such as Mobil X421) shall be furnished. Unless otherwise stated the name of the manufacturer to be used will be furnished to the Owner by the Contractor.

Following the initial operation of the equipment the Contractor shall relubricate, changing and adding lubricants, at the intervals or frequency as recommended by the manufacturer until acceptance.

SECTION 14

SHOP DRAWINGS AND SAMPLES

GP-14.01. LISTING OF ITEMS

Following execution of the Contract by the Contractor, the Engineer will submit to the Contractor a list of equipment, materials, and other items for which shop drawings, layouts, or samples will be required. This listing shall not be construed to be all-inclusive and may be added to, or deleted from, as may be required in the opinion of the Engineer.

GP-14.02. ACCEPTANCE OF MANUFACTURERS OR VENDORS

The Contractor, with such promptness and in such sequence as to cause no delay in the Work, shall submit to the Engineer the name of the manufacturer or vendor for each item on the list or addition to the list submitted. The Contractor shall make no awards, and no work under any item shall proceed, until acceptance of the manufacturer or the Engineer has given vendor. Such acceptance will be only on the basis of the manufacturer's or vendor's experience and reputation and will not imply that the shop drawings or samples for the item will be acceptable. Review of shop drawings for an item will depend upon full compliance with the Contract Documents as demonstrated by material submitted.

GP-14.03. ELECTRICAL INTERCONNECTIONS

Where the Project includes electrical equipment and electrical control systems and where the Work of the Project involves more than one Contractor, it shall be the responsibility of the Electrical Contractor to coordinate and complete power, control, and electrical signal interconnections for all equipment included in the Project.

GP-14.04. SHOP DRAWING SUBMITTAL REQUIREMENTS

Shop drawings and data shall be submitted to the Engineer for each item on the latest revised list determined from Section GP-14.01 above. Submittals shall be made sufficiently in advance of the time when items included therein are to be incorporated into the Work to permit proper review, necessary revisions, and resubmittals without causing a delay in the performance of the Work.

Shop drawings shall present complete and accurate information relative to all working dimensions, equipment weights, assembly, and section views, and all necessary details pertaining to coordinating the Work of the Contract, lists of materials and finishes, parts lists and the description thereof, lists of spare parts and tools where such parts or tools are required, and any other items of information that are required to demonstrate detailed compliance with the Contract Documents. Drawings for electrical equipment shall include elementary and interconnection diagrams.

Except as otherwise provided in Section 13.02, Contractor's submittal of Shop Drawings shall constitute Contractor's representation that submitted Shop Drawings and the specifications pertaining thereto have been thoroughly reviewed by Contractor for consistency with the Specifications and that submitted Shop Drawings strictly comply with the requirements of the Contract Documents; that the Contractor has determined and verified all quantities, dimensions, field construction criteria, materials catalog numbers, and similar data, and that Contractor has reviewed or coordinated each shop drawing with the requirements of the Work and the Contract Documents. The return to Contractor of Shop Drawings stamped "Reviewed" shall in no way relieve Contractor from sole responsibility for strictly complying with the specifications in the Contract Documents. Contractor shall reimburse Owner for the costs (including labor costs) and expenses of Engineer incurred in the review of Shop Drawings which have been twice before returned marked as "Rejected" or "Resubmit".

Unless otherwise permitted in specific cases, all data shall be transmitted to the Engineer by the Prime Contractor.

Each shop drawing submitted shall indicate the following:

(a) Project name and contract number

(b) Manufacturer of the equipment

(c) Notation as to whether original submittal or resubmittal

(d) Date received by Contractor from manufacturer or vendor

(e) Date submitted to Engineer

Each shop drawing submittal shall be accompanied by a transmittal letter indicating the item or items submitted, with particular reference to latest revised list of equipment, materials, and other items described in GP-14.01 above and the appropriate section of the Contract Documents to which the items apply. The transmittal letter shall also indicate whether the submittal constitutes a complete set of drawings for the item, a partial set of drawings for which additional submittals are to be expected by the Engineer, or a partial set of drawings to complete a previous submittal. In any case, the Contractor shall indicate by the transmittal letters when the submittals for an item are intended to be complete.

Unless otherwise stated in the Special Provisions, the Contractor shall submit at least five copies of drawings, catalog data, and similar items for review. This number includes one for return to the Contractor noted as "Reviewed" or request for amendment. If the Contractor desires more than one copy returned to it, it shall submit with the initial and any subsequent transmittals the additional number desired up to a maximum of three copies.

If the Engineer requires additional copies, it will so inform the Contractor upon return of the material noted as "Reviewed". Additional copies of "Reviewed" shop drawings will be requested in the cases where the subject matter shown thereon requires coordination of two or more prime Contracts. Copies of such drawings, wl received, will be retransmitted by the Engineer.

A current file of "Reviewed" shop drawings will be maintained by the Engineer and, where so stated in the Special Provisions, said current file of "Reviewed" shop drawings will be at the job site. Any Contractor may have access to said "Reviewed" shop drawing file during normal office hours. It shall be the responsibility of each prime Contractor to avail itself of information in said "Reviewed" shop drawing file and to be aware of coordination requirements involving its work in the event it does not receive appropriate shop drawings from the Engineer.

GP-14.05. ENGINEER'S REVIEW OF SHOP DRAWINGS

The Engineer's review of shop drawings is for general compliance with the Contract Documents only and is not a complete check of the method of assembly, erection, construction or detailed review of the specifications. Such review shall in no way be construed as permitting any departure whatsoever from the Contract Documents, except where the Contractor has previously requested and received written approval of the Engineer for such departure. When requested by Contractor, proposed departures from the Contract Documents will be considered by Engineer at Contractor's expense, whether or not accepted. The cost of Engineer's conflict review and any revisions made as a result of Contractor's requested departure shall be at the expense of Contractor. Contractor shall reimburse Owner for the referenced costs and expenses of Engineer upon demand.

Review of shop drawings by the Engineer will be limited to complete submittals except where review of a partial submittal is specifically requested by the Contractor and where such review of a partial submittal is necessary for timely completion of the Work of the Contract. Where shop drawings of related items are necessary for review of a particular submittal, the Engineer will so inform the Contractor, who will promptly submit such shop drawing of said related items.

Drawings and similar data will be reviewed and stamped by the Engineer as follows:

(a) "Reviewed," if no change or rejection is made. All but four copies of the submitted data will be returned.

(b) "Reviewed and Noted," if minor changes or additions are made but resubmittal is not considered necessary. All but four copies of the submitted data will be returned and all copies will bear the corrective marks.

(c) "Resubmit," if the changes requested are extensive or if retransmittal of the submittal to another Contractor is required. In this case, the Contractor shall resubmit the items after correction, and the same number of copies shall be included in the resubmittal as in the first submittal. One copy of the first submittal will be retained by the Engineer and two copies will be returned to the Contractor.

(d) "Rejected," if it is considered that the data submitted cannot, with reasonable revision, meet the requirements of the Contract Drawings and Specifications.

GP-14.06. RESUBMITTALS

Any changes, other than those indicated as requested, made in drawings or other data shall be specifically brought to the attention of the Engineer upon resubmittal. Changes or additions shall not be made in, or to, "Reviewed" data without specific notice to the Engineer.

If, after reasonable correction and resubmittal of the shop drawings for an item of equipment, acceptance is not given, the Contractor shall submit the name of another manufacturer or vendor to supply the item required in accordance with GP-14.02. Should progress of the Work be delayed by the changing of the manufacturer or vendor, such a cause will not be considered an extenuating circumstance beyond the control of the Contractor, and charges for delay if otherwise applicable, will be levied and shall be born solely by the Contractor.

GP-14.07. SAMPLES

Samples shall be submitted to the Engineer as required on the latest revised list determined from Section GP-14.01. The samples shall be properly identified by tags and shall be submitted sufficiently in advance of the time when they are to be incorporated into the Work, so that rejections thereof will not cause delay. A letter of transmittal from the Contractor requesting review shall accompany such samples.

The procedures set forth in Section GP-14.05 and GP-14.06 above for shop drawings shall be used for processing samples.

SECTION 15

TEMPORARY SERVICES

GP-15.01. TEMPORARY HEAT

It is the obligation and responsibility of the Contractor to provide and maintain temporary heat by means of portable electric, oil or gas-fired units. The Contractor shall provide and pay for all fuel and electricity used in the temporary facilities and shall provide proper smoke pipes or other means to prevent smoke or smudge from marking up walls, ceilings, or other parts of equipment.

Should the temporary heating facilities require electric service, the Contractor shall provide the necessary wiring and power.

After their installation and testing of the permanent heating system facilities, they may be used for temporary heating purposes with concurrence of the Owner. Any temporary wiring or piping required and all power consumed shall be the obligation and responsibility of the Contractor.

If the Contractor elects to utilize the permanent heating facilities included in the Project for temporary heat, it shall be the responsibility of the Contractor to guarantee the heating system for a period of one year following final acceptance of the Contract or Beneficial Occupancy, whichever comes first. It shall be the responsibility of the Contractor to replace all filters before the final acceptance of the Contract.

It shall be the responsibility of the Contractor to repair any damage to heating and ventilating equipment suffered as the result of use by the Contractor.

After the buildings are enclosed excepting windows, doors and similar apertures, temporary enclosures for all apertures shall be provided and temperatures in the entire building shall be continuously maintained at not less than 40 degrees Fahrenheit unless specific permission is granted in writing by the Engineer. The Contractor shall install on each floor, near the center of the building, a suitable, securely fastened, and properly protected thermometer.

The Owner will supply all heat after final acceptance of the Contract or upon Beneficial Occupancy of a structure by the Owner.

GP-15.02. TEMPORARY ELECTRIC LIGHT AND POWER

It is the obligation and responsibility of the Contractor to provide and maintain temporary facilities for furnishing light and power necessary for operations under the Contract, and to make all necessary arrangements therefor, including all required connections, ordering the meter, and paying all fees and inspection charges.

The Contractor shall make the temporary light and power facilities available to any and all subcontractors, for their use in connection with their contracts, and may charge each subcontractor for such service an amount not to exceed a fraction of the cost of the services, as billed by the utility, proportional to the value of the Project. Removal of temporary facilities shall be by the Contractor. The installation and meters shall remain until need for same has ceased or until completion of the Contract.

GP-15.03. POWER, FUEL AND WATER FOR TESTING

The permanent electrical service, or any part thereof, shall not be connected until the tests on wiring and grounding systems have been successfully completed and test data reviewed by the Engineer.

Where tests on equipment require electric power for testing, such power shall be supplied through the permanent electrical service and through the permanent electrical distribution and control equipment. All power for testing will be provided by the Owner. The use by the Owner of the permanent electrical service, electrical distribution system, and/or control equipment for the purpose of testing shall not constitute acceptance of the Work.

Where tests are specified on fuel-burning equipment, or where tests are specified on other equipment, and require simultaneous operation of the fuel burning equipment, all fuel for such tests will be provided by the Owner.

Unless otherwise specified, water of acceptable quality for testing shall be furnished by the Contractor.

GP-15.04. TEMPORARY WATER FACILITIES

Where the public water supply is available and under control of the Owner, water will be furnished to Contractor. Such water supply shall be subject at all times to the control and supervision of the superintendent or manager of the water utility, and at a cost determined by the schedule of charges on a file at the office of the utility. Prior to making use of any municipal water, permission in writing to use the water for any particular purpose shall be obtained from the superintendent or manager. The cost, if any, of connection to the water supply shall be paid by the Contractor.

Where the public water supply is owned or controlled by a private company, corporation or individual or municipality other than the Owner, the Contractor shall make such arrangements at its cost for service with the owners thereof as he requires.

The Contractor shall make the temporary water service available to all subcontractors, for their reasonable use in connection with their Contracts. Removal of temporary facilities shall be the responsibility of the Contractor. The installation and meters shall remain until need for same has ceased or until completion of the Contract.

- END OF SECTION -

DIVISION 1

GENERAL REQUIREMENTS

SECTION 01010

SUMMARY

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes the following:
1. Work covered by the Contract Documents.
2. Sequence of Operations.
3. Utility Shutdowns
4. Tie-ins and Disconnections
5. Temporary Systems
6. Use of premises.
7. Specification formats and conventions.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

A. The Contractor shall provide all material, services, labor, tools and equipment, necessary to construct this project. The following is a brief description of the major work items included in the contract: Construction of approximately 15,000 LF of water main and approximately 26 existing meters reconnected to new lines and 10 new meter settings including all related appurtenances as shown on the Drawings and described in the Specifications. Also included are the following: A hydropnuematic pre-fabricated pump station. Fencing of Cemetary Tank, Town Tank and Dehart Pump Station. Inspection of Cemetery Tank and Wrigley Tank.

1.03 SEQUENCE OF OPERATIONS

A. Wells Fork and KY 650 extensions can only be put into service after the KY 650 Hydropnuematic pump station is in service.

B. Existing water lines must be kept in service until all meter reconnects have been completed and all branch lines have been tied into new water main. Sterilization and testing of the new water main will be completed prior to any meter reconnects being changed over to the new main

1.04 UTILITY SHUTDOWNS

A. One-week advance notice to the Owner is required prior to performing any utility shutdown unless of an emergency in nature.
B. Contractor shall know where all existing valves are located and shall be able to shut down expeditiously in case of line breaks.
C. The existing water line is shown as an approximate location on the plans. The contractor shall use extreme caution while laying line not to break existing line and interupt service to Sandy Hook Water District. existing customers.

1.05 TIE-INS AND DISCONNECTIONS

A. Contractor shall furnish all materials and shall provide excavation, de-watering, scaffolding and support operations to support tie-ins.

1.06 TEMPORARY SYSTEM (S)

SECTION 01015

WORK SEQUENCE

PART 1 - GENERAL

1.01 WORK INCLUDED

The Contractor shall submit to the Engineer for review and acceptance a complete schedule of his proposed sequence of construction operations prior to commencement of work. However, the Engineer shall not accept a construction schedule that fails to utilize the entire time allocated for the construction of the water system extension. This schedule requirement in no way prevents the Contractor from completing the project in a shorter time frame than scheduled. The construction schedule shall be submitted and approved by the Owner prior to the submittal of the first partial payment request. A revised construction schedule shall be submitted with every subsequent partial payment request. This revised schedule must be approved by the Owner prior to payment. The contractor shall use the following sequence of construction while working on the new water mains for the Sandy Hook Water System Improvement Project.

1. Locate all existing valves and make sure they are workable
2. Install new blow offs and flushing hydrants on the existing lines as shown on the plans
3. Install new water line using extreme caution not to damage existing water lines or services
4. Upon installation of new line, 1) pressure test 2) sterilize and provide documentation to engineer of successful water quality tests
5. Reconnect all existing meters to new line and replace existing coppersetters and meters with new tandemsetters, new meters, and new IPRV's
6. Reconnect all service lines to new water mains and existing mains as dictated by the plans
7. Cap, block, and abandon in place existing lines

1.02 RELATED WORK

A. Section 01010 - Summary of Work.

1.03 ADDITIONAL INFORMATION

Any delays caused by the Contractor shall be at his expense and at no cost to the Owner or Engineer.

- END OF SECTION -

SECTION 01016

OCCUPANCY

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The Contractor shall be aware that after each major portion of the project is completed, the Contractor shall notify the Engineer that those specific operations are complete and prior to replacing that portion of the work into service shall request an interim inspection of the work to be returned to or placed into service.

B. The interim inspection requested by the Contractor shall not preclude or supersede the final inspection of the project or reduce the Contractor's responsibility for the completed portion prior to final acceptance of the work by the Owner.

C. The Contractor shall provide all necessary temporary controls and other items required for operation of all work placed into service prior to final acceptance as required. At such time as new controls, etc. are complete and functioning, the Contractor shall remove all temporary installed items.

- END OF SECTION -

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 WORK INCLUDED

The Contractor shall furnish all necessary labor, machinery, tools, apparatus, equipment, materials, equipment, service, other necessary supplies and perform all work, including all excavation and backfilling (without additional compensation, except where specifically set out in these specifications) at the unit or lump sum prices for the following items.

1.02 PROGRESS AND PAYMENTS SCHEDULES

A. Within ten (10) days after the date of formal execution of the AGREEMENT, the Contractor shall prepare and submit to the Engineer, for approval, a construction schedule which depicts the Contractor's plan for completing the contract requirements and show work placement in dollars versus contract time. The Contractor's construction schedule must be approved by the Engineer before any payments will be made on this contract.

B. Within ten (10) days after the date of formal execution of the CONTRACT AGREEMENT, the Contractor shall prepare and submit to the Engineer, for approval, a periodic estimate which depicts the Contractor's cost for completing the contract requirements and show by major unit of the project work, the Contractor's dollar value for the material and the labor (two separate amounts) to be used as a basis for the periodic payments. The Contractor's periodic estimate must be approved by the Engineer before any payments will be made on this contract.

C. The Engineer's decision as to sufficiency and completeness of the Contractor's construction schedule and periodic estimate will be final.

D. The Contractor must make current, to the satisfaction of the Engineer, the construction schedule and periodic estimate each time he requests a payment on this contract.

E. The Contractor's construction schedule and periodic estimate must be maintained at the construction site available for inspection and shall be revised to incorporate approved change orders as they occur.

F. When the Contractor requests a payment on this contract, it must be on the approved periodic estimate and be current. Further, the current periodic estimate and construction schedule (both updated and revised) shall be submitted for review and approval by the Engineer before monthly payments will be made by the Owner. The Contractor shall submit six (6) current copies of each (periodic estimate and construction schedule) when requesting payment.

1.03 CONDITIONS FOR PAYMENT

A. The Owner will make payments for acceptable work in place and materials properly stored on-site. The value of payment shall be as established on the approved construction schedule and periodic estimate, EXCEPT the Owner will retain ten percent (10%) of the work in place and a percentage as hereinafter listed for items properly stored or untested.

B. No payment will be made for stored materials unless a proper invoice form the supplier is attached to the pay request. Further, no item whose value is less than $1,000 will be considered as stored materials for pay purposes.

C. Payment for pipeline items shall be limited to eighty percent (80%) of the bid price until the pipeline items have been tested and clean up has been completed and accepted by the Engineer.

D. Payment for equipment items shall be limited to eighty-five percent (85%) of their scheduled value (materials portion only) until they are set in place. Eighty-five percent (85%) for stored materials and equipment shall be contingent on proper on-site storage as recommended by the manufacturer or required by the Engineer.

E. Payment for equipment items set in place shall be limited to ninety percent (90%) of their scheduled value until they are ready for operation and have been certified by the manufacturer. Ninety percent (90%) payment for installed equipment shall be contingent on proper routine maintenance of the equipment in accordance with the manufacturer's recommendations.

F. Payment for equipment items set in place and ready for operation shall be limited to ninety-five percent (95%) of their scheduled value until all acceptance tests have been completed and the required manufacturer's pre-startup operator's training has been completed.

G. Payment for the labor portion of equipment items will be subject only to the degree of completeness and the appropriate retainage.

H. The retainage shall be an amount equal to 10% of said estimate. The retainage on the equipment items shall be 10% as defined hereinbefore.

I. If at any time thereafter when the progress of the WORK is not satisfactory or determine that the Contractor is not making satisfactory progress, additional amounts may be retained.

1.04 CLAIMS FOR EXTRA WORK

A. If the Contractor claims that any instructions by Drawings or otherwise involve extra cost, he shall give the Engineer written notice of said claim within ten (10) days after the receipt of such instructions and, in any event before proceeding to execute the work, stating clearly and in detail the basis of his claim or claims. No such claim shall be valid unless so made.

B. Claims for additional compensation for extra work, due to alleged errors in spot elevations, contour lines or bench marks, will not be recognized unless accompanied by certified survey data, made prior to the time the original ground was disturbed, clearly showing that errors exist which resulted, or would result, in handling more material or performing more work than would reasonably be estimated from the Drawings and topographical maps issued.

C. Any discrepancies which may be discovered between actual conditions and those represented by the topographical maps and Drawings shall at once be reported to the Engineer, and work shall not proceed, except at the Contractor's risk, until written instructions have been received by him from the Engineer.

D. If, on the basis of the available evidence, the Engineer determines that an adjustment of the Contract Price or time is justifiable, the procedure shall then be as provided herein for "Changes in the Work".

E. By execution of this Contract, the Contractor warrants that he has visited the site of the proposed work and fully acquainted himself with the conditions there existing relating to construction and labor, and that he fully understands the facilities, difficulties and restrictions attending the execution of the work under this Contract. The Contractor further warrants that he has thoroughly examined and is familiar with the Drawings, Specifications and all other documents comprising the Contract. The Contractor further warrants that by execution of this Contract his failure when he was bidding on this Contract to receive or examine any form, instrument or document, or to visit the site and acquaint himself with conditions there existing, in no way relieves him from any obligation under the Contract, and the Contractor agrees that the Owner shall be justified in rejecting any claim based on facts regarding which he should have been on notice as a result thereof.

1.05 DETERMINATION OF THE VALUE OF EXTRA (ADDITIONAL) OR OMITTED WORK

A. The value of extra (additional) or omitted work shall be determined in one or more of the following ways:

1. On the basis of the actual cost of all the items of labor (including on-the-job supervision), materials and use of equipment, plus a maximum 20% for added work or a minimum 20% for deleted work which shall cover the Contractor's general supervision, overhead and profit. In case of subcontracts, the sum of total overhead amounts of the subcontractors and Contractor, plus total profit amounts for the subcontracts and Contractor shall not exceed 25% of the cost. Subcontractors shall be limited to 15% and Contractors shall be limited to 10% for combined overhead and profit. The cost of labor shall include required insurance, taxes and fringe benefits. Contractor to provide detailed breakdown of all cost as justification of change in work. Equipment costs shall be based on current rental rates in the areas where the work is being performed, but in no case shall such costs be greater than the current rates published by the Associated Equipment Distributors, Chicago, Illinois.

2. By estimate and acceptance in a lump sum.

3. By unit prices named in the Contract or subsequently agreed upon.

B. Provided, however, that the cost or estimated cost of all extra (additional) work shall be determined in advance of authorization by the Engineer and approved by the Owner.

C. All extra (additional) work shall be executed under the conditions of the original Contract. Any claim for extension of time shall be adjusted according to the proportionate increase or decrease in the final total cost of the work unless negotiated on another basis.

D. Except for over-runs in contract unit price items, no extra (additional) work shall be done except upon a written change Order from the Engineer, and no claim on the part of the Contractor for pay for extra (additional) work shall be recognized unless so ordered in writing by the Engineer.

PART 2 - PRODUCTS

2.01 WATER MAIN

A. Payment for installing the water main will be made at the contract unit price per linear foot, complete in place, which shall include compensation for furnishing pipe, trenching (including rock excavation), earth or Class I material bedding, thrustblocking, earth backfill, grip rings, fittings, crushed stone pavement replacement, sidewalk repair or replacement, disinfection, clean up and restoration of all disturbed areas, including seeding and mulching as required, testing, bonding, and all appurtenances required. The quantity of water mains to be paid for shall be the length of the completed line as measured along its centerline without any deduction for lengths of fittings, valves or other appurtenances.

B. Casing for sewer main, and sewer lateral crossings, as described in the plan sheets will be incidental to laying the main water line. There will be no additional compensation for these pvc casings. Please figure these costs into the water line price.

C. Use of crushed stone bedding on the water main will be determined in the field by the engineer if quality bedding material is not available. Please figure bedding costs into the water line price.

2.02 GATE VALVES AND BOXES

Payment for furnishing and installing gate valves and valve boxes with covers in water mains will be made at the contract unit price each, complete in place, which shall include compensation for furnishing, hauling, trenching (including rock excavation), bedding, laying, jointing, backfilling, concrete supports and concrete collars.

2.03 TAPPING SLEEVE AND VALVE

Payment for tapping sleeves and valves shall be made at the contract unit price each, complete in place including all excavation, material, tapping sleeve, tapping valve, box, concrete collar and other items required to make a complete and workable tap.

2.04 TIE INTO EXISTING WATER MAIN

Payment for a complete and dry tie in of the new main to an existing main. This shall include tees, blocking, grip rings, pipe and labor to make a complete tie in. Gate Valves will be paid seperately.

2.05 REPLACEMENT OF EXISTING METER SETTERS AND BOXES

Payment for replacement of the coppersetters, and boxes, made at the contract unit price each, complete in place including excavation, new setters, boxes, lids, pack joint couplings and reconnection of service line. Labor will be required to install owner provided meters in the new setters.

2.06 NEW CUSTOMER SERVICES

Payment will be made per complete installation to include saddle, corporation stop, CTS polyethylene service line, coppersetter, meter box and lid, excavation, casing pipe (if applicable) and all items necessary for a complete installation. Services to be placed inside the customer's property line. Same side services shall include twenty-five (25) feet of service line. Opposite side services shall also include a maximum of one hundred twenty five (125) feet of service line and all costs of boring or pushing the service line. **Owner will provide 5/8" x 3/4" meter**, contractor will be required to provide the labor to install.

Customer Service with Pressure Reducing Valve:

Payment will be made per complete installation to include saddle, corporation stop, polyethylene service line, 5/8" x 3/4" meter, tandemsetter, meter box and lid, excavation, casing pipe (if applicable) and all items necessary for a complete installation. Services to be placed four (5) feet inside the customer's property line. Same side services shall include twenty five (25) feet of service line. Opposite side services shall also include a maximum of one hundred twenty five (125) feet of service line and all costs of boring or pushing the service line. Service lines that are longer than these limits, the difference will be paid in the line item service line section.

Both items include the additional cost to provide a customer service with a 3/4" Wilkens 600 pressure reducing valve. The cost includes valve, tandem setter, meter box, meter and all other items necessary for a complete installation.

2.07 RECONNECT EXISTING METERS

Payment for re-connecting an existing service line to a new or existing water main will be paid on a per unit basis. This shall include all materials and labor including service tubing, saddle, corporation stop, inserts and pushing under the existing road to complete the installation. Twenty- Five feet of service line shall be included with the reconnect.

2.08 ADDITIONAL 1" SERVICE TUBING

Payment for additional polyethylene service pipe and fittings installed in open trench and backfilled will be made per linear foot in place. This item will only be paid for when it covers those distances outside of the ranges of payment as described in 2.06 of this section. Excavation is unclassified and included in this item.

2.09 HIGHWAY BORE W/STEEL CASING

Payment for water mains crossing the highway, roadway, driveway or other areas shown on the plans shall include the respective encasement pipe bored under roadways and will be paid for at the contract unit price per linear foot of encasement pipe for the various sizes and types. This work shall include the encasement pipe, complete in place with fittings, spacers, skids, end seals, blocking, and all items necessary for its construction and installation. Carrier pipe is paid separately under item 2.01. The casing pipe shall be 4" larger than the bell of the carrier pipe.

2.10 PVC CASING OPEN CUT

Payment for water mains crossing the highway, roadway, driveway or other areas shown on the plans shall include the pvc encasement pipe open cut under the roadway and will be paid for at the contract unit price per linear foot of encasement pipe for the various sizes and types. This work shall include all the fittings, spacers, end seals and all items necessary for its construction and installation. Asphalt replacement is not a separate pay item. Asphalt replacement shall be included in the payment of the casing.

2.11 TYPE C CREEK CROSSING

Payment for water mains crossing major creeks or streams shall include excavation, concrete, rip-rap, crushed stone, gravel backfill , anchors and PVC casing pipe when called for on the contract drawings will be paid for at the contract unit price per linear foot of creek crossing. This work shall include the excavation, concrete, gravel backfill material and anchors complete in place with fittings, blocking, and all items necessary for its construction. The length of the creek crossing to be paid for shall be measured from end to end of the encasement pipe. Carrier pipe is paid separately for Type "B".

2.12 BLOW OFF ASSEMBLY

Payment for flushing assemblies will be made at the unit price, complete in place, which shall include all piping, fittings, gate valve and valve box and cover, 6 feet of connecting pipe, concrete blocking, caps, and all other materials and labor necessary to complete the installation.

2.13 FLUSH HYDRANT ASSEMBLY

Payment for flushing assemblies will be made at the unit price, complete in place, which shall include all piping, fittings, 6" hydrant, valves and valve box, 6 feet of connecting pipe, concrete blocking and supporting pad, drainage bed, stainless steel all thread rods and nuts, wrenches, and all other materials and labor necessary to complete the installation. Additional connector pipe is not included in this item and will be paid separately under the pay item "Water Main". The price shall also include the removal of an existing operative fire hydrant.

2.14 CUT AND PLUG EXISTING WATER MAIN

Payment for cutting and plugging the existing water main shall include all materials and labor necessary for completing the disconnection of the existing water line. This will be paid per cut and plug unit price and will include piping, mechanical joint cap, grip rings, concrete blocking and other appurtenances required to complete the installation. Size of the piping will be paid as one price and will not be differentiated.

2.15 KY 650 HYDROPNUEMATIC PUMP STATION

Payment for the pre-fabricated above ground pump station shall be on a lump sum basis as show on the construction plans. This shall include all materials, labor, concrete pad, fencing, electric, and site work necessary for completing the installation and shall also include electric service, crushed stone, culvert pipe, tie-ins, and valves. .

2.16 TIE IN TO EXISTING BLOW OFF ASSEMBLY

Payment for connecting to an existing blow off assembly at the location listed shall include all materials and labor necessary for making a connection to the existing water main as shown on the plans. Payment will be made per connection and will include, tees, blocking, grip rings and a maximum of 10 LF of pipe. Size of the tie ins will be paid as one unit price and will not be differentiated.

2.17 AIR RELEASE VALVE ASSEMBLY

Payment for a 3/4" air release valve will be made at the contract unit price each, complete in place, including all excavation, material, meter box, saddles, fittings, backfilling, and labor necessary to complete to complete the installation.

2.18 FENCING OF CEMETERY & TOWN TANKS, AND DEHART PUMP STATION

Payment shall include all fencing, gates, posts, barbed wire, supports, and concrete to make a complete installation as shown on the fence details and site drawings. Payment will be made as lump sum and not on a per foot basis. Payment will also include labor, insurance and other items related to the installation. Also, included are the filter fabric and crushed stone as shown on the plans.

2.19 INSPECTION OF WRIGLEY & CEMETERY TANKS

Payment for inspecting the interior and exterior of both tanks described in the specifications shall include all labor, materials, and insurance etc. to complete a written report, including pictures and recommendations, and shall be on a lump sum basis. This work shall be done by a qualified tank inspection company, Horizon Inspection Services or approved equal that employs NACE trained commercial divers and adheres to AWWA, SSPC, and ASTM standards. The tanks shall remain in service during the inspection process. This also includes the filter fabric and crushed stone for the Wrigley tank site.

2.20 DRIVEWAY BORES W/STEEL CASING

Payment for water mains crossing driveways as shown on the plans shall include the respective encasement pipe bored under driveways and will be paid for at the contract unit price per linear foot of encasement pipe for the various sizes and types. This work shall include the encasement pipe, complete in place with fittings, spacers, skids, blocking, and all items necessary for its construction and installation. Carrier pipe is paid separately under item 2.01. The casing pipe shall be 4" larger than the bell of the carrier pipe.

2.21 PRV REPLACEMENT IN EXISTING LINE

Payment for this work shall be for at a contract unit price that includes all materials and labor to install a 1" PRV in an existing line, including meter box, IPRV, by-pass, setter and fittings to complete the installation.

2.22 RESETTERS AND IPRV'S

Payment for 5/8" x 3/4" resetter shall be made at the contract unit price each, complete in place including all Excavation, materials, ¾" individual pressure reducing valve and other pack joint couplings required to make a complete installation. Labor will be required to install existing meters in the new resetters.

(NOTE: All rock excavation, crushed stone bedding, shall be included in the per unit price for pipe. No additional payment will be provided for these items)

PART 3 - EXECUTION

3.01 PAY ITEMS

A. The pay items listed herein before refer to the items listed in the Bid Schedule and cover all of the pay items under the base bid for this contract.

B. Any and all other items of work listed in the specifications or shown on the Contract Drawings for this contract shall be considered incidental to and included in those pay items.

3.02 QUANTITIES OF ESTIMATE

A. Wherever the estimated quantities of work to be done and materials to be furnished under this Contract are shown in any of the documents, including the Bid Proposal, they are given for use in comparing bids and the right is especially reserved except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the Owner to complete the work contemplated by this Contract, and such increase or diminution shall not give cause for claims or liability for damages. The Engineer will not be financially responsible for any omissions from the Contract Documents and therefore not included by the Contractor in his proposal.

B. Aerial photographs utilized for plan sheets in the Contract Documents are indicated at an approximate scale and shall not be scaled for quantity take-offs. The pipeline quantities listed in the Bid Schedule are given for use in comparing bids and may not be the actual quantities to be installed. It is the Contractor's responsibility to field verify the length and quantities of pipeline to be installed prior to the ordering of materials. Payment on unit price contracts are based on actual quantities installed. The Owner or Engineer will not be financially responsible for any shortage of pipe or overrun of pipe ordered for the pipeline quantities.

C. The actual quantities of all materials to be used for this project shall be field verified prior to the Contractor ordering the necessary materials. The quantity listed in the bid schedule is given for use in comparing bids and may increase or diminish as may be deemed necessary or as directed by the Owner. Any such increase or diminution shall not give cause for claims or liability for damages. The Engineer or Owner will not be financially responsible for any charges incurred for restocking of materials ordered.

- END OF SECTION -

SECTION 01030

LABOR PROVISIONS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The Contractor shall conform to all provisions of the Kentucky Department of Labor, Wage Decisions (latest revisions), relative to minimum wages and hours as they may apply to the work to be accomplished under these specifications.

B. In addition to the above, certain Federal laws and regulations shall govern the work and shall supplement or supplant the Kentucky Department of Labor Wage Decisions cited above, as the case may be.

1.02 RELATED SECTIONS

A. Section 3 - Part 1 Hours and Wages

1.03 WAGE RATES

Prevailing wage rates apply to this job. The Contractor will utilize, when feasible, local labor and will pay them wages commensurate with the wages prevailing in the Community.

1.04 LABOR PREFERENCE

Where feasible, the Contractor will utilize local labor.

1.05 HOURS OF WORK

A. Hours of work shall be as set out in Kentucky Department of Labor Wage Decisions (latest revisions); that is, not more than eight (8) hours in one calendar day, nor more than forty (40) hours in one week, except in case of emergency caused by fire, flood or damage to life and property.

B. Any laborer, workman, mechanic, helper, assistant or apprentice working in excess of forty (40) hours per week, except in case of emergency, shall be paid not less than 1-1/2 times the wage rate. Whenever overtime work is scheduled, the Contractor shall give prior notice to the Owner.

- END OF SECTION -

SECTION 01040

COORDINATION

PART 1 - GENERAL

1.01 COORDINATION OF THE WORK

The Contractor shall coordinate the work of all the crafts, trades and subcontractors engaged on the Work, and he shall have final responsibility as regards the schedule, workmanship and completeness of each and all parts of the Work.

All crafts, trades and subcontractors shall be made to cooperate with each other and with others as they may be involved in the installation of work which adjoins, incorporates, precedes or follows the work of another. It shall be the Contractor's responsibility to point out areas of cooperation prior to the execution of subcontract agreements and the assignment of the parts of the Work. Each craft, trade and subcontractor shall be made responsible to the Owner, for furnishing embedded items, giving directions for doing all cutting and fitting, making all provisions for accommodating the Work, and for protecting, patching, repairing and cleaning as required to satisfactorily perform the Work.

The Contractor shall be responsible for all cutting, digging and other action of his subcontractors and workmen. Where such action impairs the safety or function of any structure or component of the Project, the Contractor shall make such repairs, alterations and additions as will, in the opinion of the Engineer, bring said structure or component back to its original design condition at no additional cost to the Owner.

Each subcontractor is expected to be familiar with the General Requirements and all sections of the Detailed Specifications for all other trades and to study all Drawings applicable to his work to the end that complete coordination between trades will be affected. Each Contractor shall consult with the Engineer if conflicts exist on the Drawings.

The Contractor shall conduct testing of water lines in a timely manner. The Contractor shall make provisions to test all water lines regardless of whether or not planned pump stations have been delivered and/or installed.

- END OF SECTION -

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 WORK INCLUDED

Shop drawings, descriptive literature, project data and samples (when samples are specifically requested) for all manufactured or fabricated items shall be submitted by the Contractor to the Engineer for examination and review in the form and in the manner required by the Engineer. All SUBMITTALS shall be furnished in at least six (6) copies and shall be checked, reviewed and signed by the Contractor before submission to the Engineer. The review of the Drawings by the Engineer shall not be construed as a complete check but only for conformance with the design concept of the Project and for compliance with information given in the Contract Documents. Review of such drawings will not relieve the Contractor of the responsibility for any errors that may exist, as the Contractor shall be responsible for the dimensions and design of adequate connections, details, and satisfactory construction of all work.

1.02 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. General Provision.

B. Section 01720 - Project Record Documents (As-Builts).

1.03 DEFINITIONS

The term "submittals" shall mean shop drawings, manufacturer's drawings, catalog sheets, brochures, descriptive literature, diagrams, schedules, calculations, material lists, performance charts, test reports, office and field samples, and items of similar nature which are normally submitted for the Engineer's review for conformance with the design concept and compliance with the Contract Documents.

1.04 GENERAL CONDITIONS

A. Review by the Engineer of shop drawings or SUBMITTALS of material and equipment shall not relieve the Contractor from the responsibilities of furnishing same of proper dimension, size, quality, quantity, materials and all performance characteristics to efficiently perform the requirements and intent of the Contract Documents. Review shall not relieve the Contractor from responsibility for errors of any kind on the shop drawings. Review is intended only to assure conformance with the design concept of the Project and compliance with the information given in the Contract Documents.

B. Review of shop drawings shall not be construed as releasing the Contractor from the responsibility of complying with the Specifications.

1.05 GENERAL REQUIREMENTS FOR SUBMITTALS

A. Shop Drawings:

1. Shop drawings shall be prepared by a qualified detailer. Details shall be identified by reference to sheet and detail numbers shown on Contract Drawings. Where applicable, show fabrication, layout, setting and erection details.

2. Shop drawings are defined as original drawings prepared by the Contractor, subcontractors, suppliers, or distributors performing work under this Contract. Shop drawings illustrate some portion of the work and show fabrication, layout, setting or erection details of equipment, materials and components. The Contractor shall, except as otherwise noted, have prepared

the number of reviewed copies required for his distribution plus two (2) which will be retained by the Engineer. Shop drawings shall be folded to an approximate size of 8-1/2" x 11" and in such manner that the title block will be located in the lower righthand corner of the exposed surface.

B. Project data shall include manufacturer's standard schematic drawings modified to delete information which is not applicable to the Project, and shall be supplemented to provide additional information applicable to the Project. Each copy of descriptive literature shall be clearly marked to identify pertinent information as it applies to the Project.

C. Where samples are required, they shall be adequate to illustrate materials, equipment or workmanship, and to establish standards by which completed work is judged. Provide sufficient size and quantity to clearly illustrate functional characteristics of product and material, with integrally related parts and attachment devices, along with a full range of color samples.

D. All submittals shall be referenced to the applicable item, section and division of the Specifications, and to the applicable Drawing(s) or Drawing schedule(s).

E. The Contractor shall review and check SUBMITTALS, and shall indicate his review by initials and date.

F. If the submittals deviate from the Contract Drawings and/or Specifications, the Contractor shall advise the Engineer, in letter of transmittal of the deviation and the reasons therefor. All changes shall be clearly marked on the submittal with a bold red mark. Any additional costs for modifications shall be borne by the Contractor.

G. In the event the Engineer does not specifically reject the use of material or equipment at variance to that which is shown on the Drawings or specified, the Contractor shall, at no additional expense to the Owner, and using methods reviewed by the Engineer, make any changes to structures, piping, controls, electrical work, mechanical work, etc., that may be necessary to accommodate this equipment or material. Should equipment other than that on which design drawings are based be accepted by the Engineer, shop drawings shall be submitted detailing all modification work and equipment changes made necessary by the substituted item.

H. Additional information on particular items, such as special drawings, schedules, calculations, performance curves, and material details, shall be provided when specifically requested in the technical Specifications.

I. Submittals for all electrically operated items (including instrumentation and controls) shall include complete wiring diagrams showing leads, runs, number of wires, wire size, color coding, all terminations and connections, and coordination with related equipment.

J. Equipment shop drawings shall indicate all factory or shop paint coatings applied by suppliers, manufacturers and fabricators; the Contractor shall be responsible for insuring the compatibility of such coatings with the field-applied paint products and systems.

K. Fastener specifications of manufacturer shall be indicated on equipment shop drawings.

L. Where manufacturers' brand names are given in the Specifications for building and construction materials and products, such as grout, bonding compounds, curing compounds, masonry cleaners, waterproofing solutions and similar products, the Contractor shall submit names and descriptive literature of such materials and products he proposes to use in this Contract.

M. No material shall be fabricated or shipped unless the applicable drawings or submittals have been reviewed by the Engineer and returned to the Contractor.

N. All bulletins, brochures, instructions, parts lists, and warranties packaged with and accompanying materials and products delivered to and installed in the Project shall be saved and transmitted to the Owner through the Engineer.

1.06 CONTRACTOR RESPONSIBILITIES

A. Verify field measurements, field construction criteria, catalog numbers and similar data.

B. Coordinate each submittal with requirements of Work and of Contract Documents.

C. Notify Engineer, in writing at time of submission, of deviations in submittals from requirements of Contract Documents.

D. Begin no work, and have no material or products fabricated or shipped which required submittals until return of submittals with Engineer's stamp and initials or signature indicating review.

- END OF SECTION -

SECTION 01450

QUALITY CONTROL

PART 1 - GENERAL

1.01 QUALITY CONTROL

A. Work of all crafts and trades shall be laid out to lines and elevations as established by the Contractor from the Drawings or from instructions by the Engineer.

B. Unless otherwise shown, all work shall be plumb and level, in straight lines and true planes, parallel or square to the established lines and levels. The Work shall be accurately measured and fitted to tolerance as established by the best practices of the crafts and trades involved, and shall be as required to fit all parts of the Work carefully and neatly together.

C. All equipment, materials and articles incorporated into the Work shall be new and of comparable quality as specified. All workmanship shall be first-class and shall be performed by mechanics skilled and regularly employed in their respective trades.

1.02 TESTS, INSPECTIONS, AND CERTIFICATIONS OF MATERIALS

A. Tests, inspections and certifications of materials, equipment, subcontractors or completed work, as required by the various sections of the Specifications shall be obtained by the Contractor and all costs shall be included in the Contract Price.

B. The Contractor shall submit to the Engineer the name of testing laboratory to be used.

C. Contractor shall deliver written notice to the Engineer at least 24 hours in advance of any inspections or tests to be made at the Project site. All inspections, tests, samples for water quality or other procedures requiring the Engineer to attest to be conducted in the field shall be done in the presence of the Engineer or his representative.

D. Certifications by independent testing laboratories may be by copy of the attestation(s) and shall give scientific procedures and results of tests. Certifications by persons having interest in the matter shall be by original attest properly sworn to and notarized.

- END OF SECTION -

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall make his own provisions for temporary electricity and water and maintain strict supervision of use of temporary utility services as follows:

1. Enforce compliance with applicable standards.
2. Enforce safety practices
3. Prevent abuse of services.
4. Pay all utility charges required.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

A. The Contractor shall obtain and pay for all permits as required by governing authorities.

B. Obtain and pay for temporary easements required across property other than that of Owner or that is shown on the Contract Drawings.

C. The Contractor shall comply with applicable codes.

1.03 REMOVAL

A. The Contractor shall completely remove temporary materials, equipment, and offices upon completion of construction.

B. The Contractor shall repair damage caused by installation and restore to specified or original condition.

1.04 TEMPORARY LIGHTING

A. The Contractor shall furnish and install temporary lighting required for:

1. Construction needs.
2. Safe and adequate working conditions.
3. Public Safety.
4. Security lighting.
5. Temporary office and storage area lighting.

B. Service periods for safety lighting shall be as follows:

1. Within construction area: All times that authorized personnel are present.
2. Public areas: At all times.

C. Costs of Installation and Preparation: Contractor shall pay all installation, maintenance and removal costs of temporary lighting.

D. Maintenance of temporary lighting service (replacement of bulbs, etc.) shall be the sole responsibility of the General Contractor.

1.05 TEMPORARY WATER

The Contractor shall provide the water necessary for testing and disinfection. Water purchased from the Water District for flushing and testing shall be paid for at the whole sale price by the contractor. The Contractor shall supply his own hoses, chlorine for disinfection, etc.

1.06 SANITARY FACILITIES

Contractor shall provide sanitary facilities as set forth in General Provisions (GP-2.04. Sanitary Regulations).

1.07 FIELD OFFICE (Office Trailer not Required for this Contract)

The Contractor shall make his own provisions for providing the electricity, telephone, gas, water, sewer, and other utilities to his office trailer that are required or as necessary for completion of the work.

The Contractor shall be responsible for all utility charges.

PART 2 - PRODUCTS

Not used.

PART 3 – EXECUTION

3.01 IMPLEMENTATION

B. The Contractor shall provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to storm drains, adjacent areas and walkways prior to the start of any site work.

C. Straw bale dikes, silt fencing and synthetic filter fabric shall be used as necessary to protect adjacent lands, surface waters, and vegetation to achieve environmental objectives.

D. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

E. Soil deposited on pavement by construction and other contractor vehicles shall be removed and the pavement swept as required.

F. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

G. Minimize amount of bare soil exposed at one time.

H. Provide temporary measures such as berms, dikes, drains, hay bales, gabions, etc., as directed by the Engineer so as to minimize siltation due to runoff.

I. Construct fill and waste areas by selective placement to avoid erosive exposed surface of silts or clays.

J. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

3.02 OPERATION AND MAINTENANCE

A. The Contractor shall inspect, repair, and maintain erosion and sediment control measures until final stabilization has been established.

3.03 REMOVAL OF FACILITIES

A. The Contractor shall remove the temporary facilities after final stabilization has been established. Used devices (including old straw bales) shall be disposed of as Construction & Demolition debris.

3.04 DUST CONTROL

A. Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere.

- END OF SECTION -

SECTION 01530

BARRIERS

PART 1 - GENERAL

1.01 WORK INCLUDED

Temporary Railing: Temporary railing shall be provided around open pits and other locations where needed, to prevent accidents or injury to persons.

1.02 COST

The Contractor shall pay all costs for temporary railing.

- END OF SECTION -

SECTION 01540

SECURITY

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Provide barricades, lanterns and other such signs and signals as may be necessary to warn of the dangers in connection with open excavation and obstructions.

B. Provide an adequate and approved system to secure the Project area at all times, especially during non-construction periods; the Contractor shall be solely responsible for taking proper security measures.

1.02 COSTS

Contractor shall pay all costs for protection and security systems.

- END OF SECTION -

SECTION 01570

TRAFFIC REGULATION

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Construction parking control.

B. Flagmen.

C. Flares and lights.

D. Haul routes.

E. Traffic signs and signals.

F. Removal.

1.02 RELATED REQUIREMENTS

A. Section 01530 - Barriers.

B. Section 01580 - Project Identification and Signs.

PART 2 - PRODUCTS

2.01 SIGNS, SIGNALS AND DEVICES

A. Post-mounted and wall-mounted traffic control and informational signs as specified and required by local jurisdictions.

B. Automatic Traffic Control Signals: As approved by local jurisdictions.

C. Traffic Cones and Drums, Flares and Lights: As approved by local jurisdictions.

D. Flagman Equipment: As required by local jurisdictions.

PART 3 - EXECUTION

3.01 CONSTRUCTION PARKING CONTROL

A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and Owner's operations.

B. Monitor parking of construction personnel's vehicles in existing facilities. Maintain vehicular access to and through parking areas.

C. Prevent parking on or adjacent to access roads or in nondesignated areas.

3.02 TRAFFIC CONTROL

A. Whenever and wherever, in the Engineer's opinion, traffic is sufficiently congested or public safety is endangered, Contractor shall furnish uniformed officers to direct traffic and to keep traffic off the highway area affected by construction operations.

B. Contractor shall abide by City regulations governing utility construction work.

C. Traffic control shall be provided according to the Kentucky Department of Highways Manual on Uniform Traffic Control Devices for Streets and Highways.

3.03 FLAGMEN

Provide trained and equipped flagmen to regulate traffic when construction operations or traffic encroach on public traffic lanes.

3.04 FLARES AND LIGHTS

Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

3.05 HAUL ROUTES

A. Consult with authorities, establish public thoroughfares to be used for haul routes and site access.

B. Confine construction traffic to designated haul routes.

C. Provide traffic control at critical areas of haul routes to regulate traffic and minimize interference with public traffic.

3.06 TRAFFIC SIGNS AND SIGNALS

A. At approaches to site and on site, install appropriate signs at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.

B. Install and operate traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control, and areas affected by Contractor's operations.

C. Relocate as work progresses, to maintain effective traffic control.

3.07 REMOVAL

Remove equipment and devices when no longer required. Repair damage caused by installation. Remove post settings to a depth of 2 feet.

- END OF SECTION -

SECTION 01580

PROJECT IDENTIFICATION AND SIGNS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The Contractor shall provide all signs required by these specifications near the site of the work. The sign shall set forth the description of the work and the names of the Owner, Engineer and Contractor as shown on the Plans or in these Specifications.

B. The Contractor shall furnish and install two(2) signs on the Project. Two signs shall conform to the specifications and painted as shown on Figure I on the following page. The location of signs shall be determined by the Owner and/or Engineer at the pre-construction meeting.

PART 2 - PRODUCT

2.01 SIGN

The sign shall be constructed of 3/4" thick APA A-B Exterior grade or marine plywood. Posts shall be 4" x 4" of fencing type material. Prime all wood with white primer. Sign shall be as shown in Figure I and II.

PART 3 - EXECUTION

3.01 MAINTENANCE

The sign shall be maintained in good condition until completion of the Project.

3.02 LOCATION

The location of the project signs shall be determined at the pre-construction conference after the contract has been awarded.

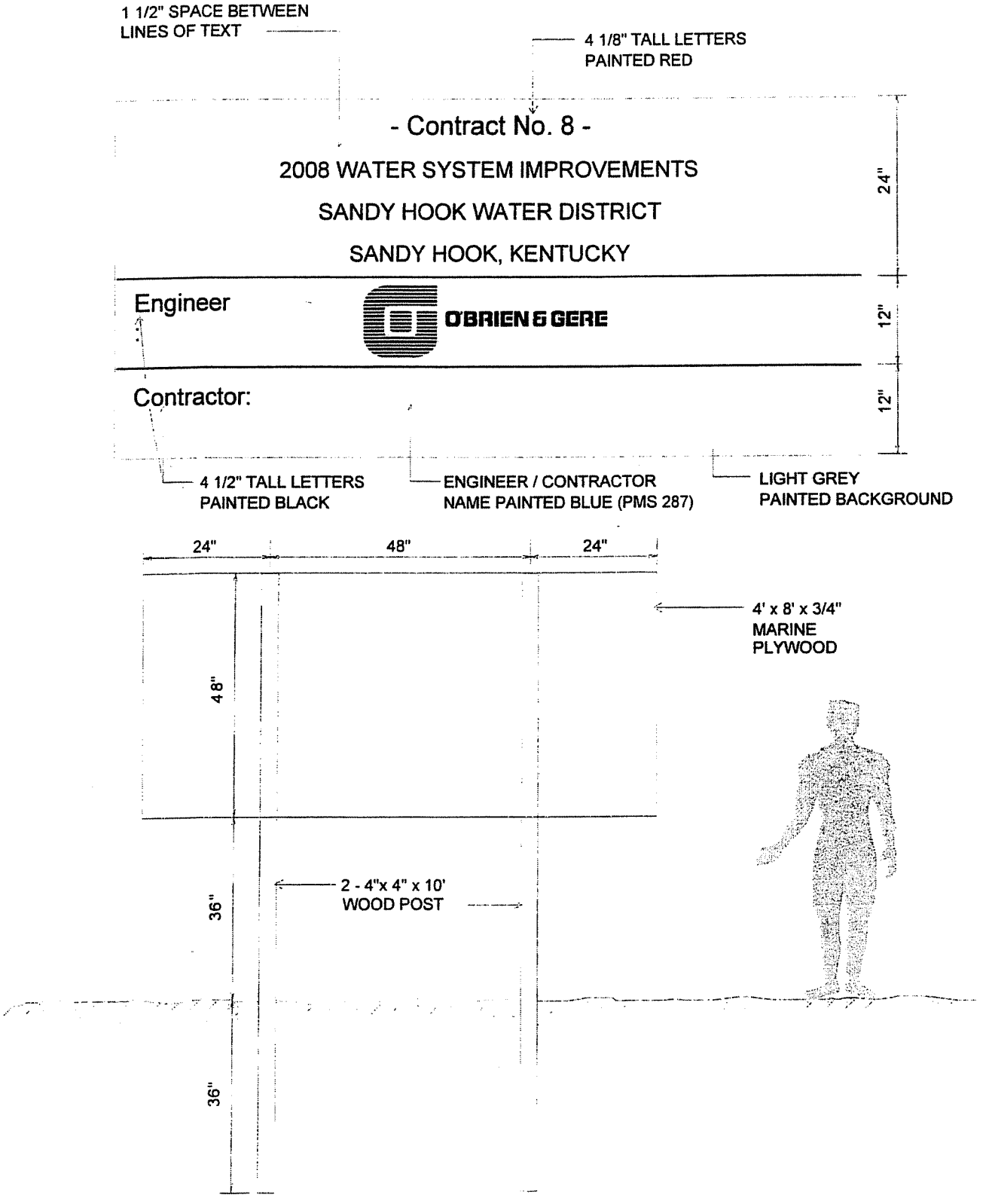

FIGURE 1

01580-2

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 COMPLIANCE WITH SAFETY REGULATIONS

The equipment items furnished shall comply with all governing Federal and State laws regarding safety, including all requirements of the Occupational Safety and Health Act of 1970 (OSHA).

PART 2 - PRODUCTS

2.01 REFERENCES

A. General Provisions: Section 10 Correction and Guarantee of Work, Section 13 Materials and Equipment.

B. Section 02600 – Pipe, Fittings, and Installation

C. Section 02640 - Valves.

D. All material shall meet applicable American Water Works Association (AWWA), American Standard Testing Methods (ASTM), Underwriters Laboratories (UL), Factory Mutual (FM), National Sanitation Foundation (NSF) standards.

SANDY HOOK WATER DISTRICT

The following is a list of approved manufacturers for the materials to be provided on the project. All material shall meet applicable AWWA, ASTM, Underwriters Laboratories, and Factory Mutual standards. The Owner approves this list and the Owner and Engineer shall approve any deviation.

MATERIAL/ITEM	APPROVED MANUFACTURER
Air Release Valve (Water and Sewer)	Apco, ARI, Primer Corp or Approved Equal
All Brass Fittings (AWWA brass)	Mueller, Ford, or Approved Equal
Aluminum Hatch	Bil-Co or Approved Equal
Blowoff Hydrant Assembly	Hydrants shall be post type Model No. A-411 as manufactured by Mueller Co. or Approved Equal.
Blowoff Hydrant Assembly (Underground)	Hydrants shall be Model No. A-412 as manufactured by Mueller Co. or Approved Equal.
Bolted Cast Couplings	Dresser, Smith & Blair, Ford, Viking-Johnson, JCM, Powerseal or Approved Equal
Brass Nipples and Pipe	State Origin

MATERIAL/ITEM	APPROVED MANUFACTURER
Brass Service Saddles	Mueller, Ford or Approved Equal
Butterfly Valves (Class 150)	Mueller Lineseal III or Approved Equal
Butterfly Valves (Class 250)	Mueller Lineseal XP or Approved Equal
Casing Spacers	State Origin
Check Valve	Valve shall be those manufactured by Muller, Kennedy, American Flow Control, or Approved Equal.
Control Valve	Valve shall be Model 710 as manufactured by Bermad or Approved Equal.
Copper Tracing Wire 14 AWG	State Origin
Customer Individual Pressure Reducing Valve	Watts N55BUM1 or Approved Equal
Customer Meter	Sensus SRII Radio Read Meters
Customer Meter Box Cover	Mid States Plastic box w/ flat CI lid w/touch read
Customer Meter Setter	Mueller or approved equal
DI and Cast Iron Full Body Tapping Sleeves	Mueller, Clow, US Pipe, American Flow or Approved Equal or Approved Equal
DI Double Strap Service Saddles	Mueller, Ford, Smith & Blair, JCM or Approved Equal
DI Pipe Class 350	Griffin, Clow, US Pipe, American DI Pipe or Approved Equal
Dual Disc Check Valve	Valve shall be Series #8800 (class 125) as manufactured by Val-Matic® Valve & Mfg. Corporation, Elmhurst, IL. USA. or Approved Equal.
Fire Hydrant	Mueller® Super Centurion 250 ® Model A-423 or Approved Equal
Flushing Hydrant Assembly	Mueller® – Super Centurion 250, Model No. A-423 or Approved Equal
Full Circle Repair Clamps (all stainless steel)	Mueller, Smith & Blair, Ford, Powerseal, Cascade or Approved Equal
Galvanized Compression Couplings	Smith & Blair, Dresser, JCM, Powerseal or Approved Equal
Gate Valves	Mueller Resilient Seat or Approved Equal
Individual Pressure Reducing Valve	Watts Model No. N55BUM1 or Approved Equal
Mainline Pressure Reducing Valve	
Manhole Ring and Cover	J. R. Hoe & Sons or Approved Equal
MJ Fittings Compact/Full Body MJ Packs	McWayne (Tyler/Union, Clow), Griffin, US Pipe, American DI Pipe or Approved Equal
Precast Concrete Manholes	Cloud, Sherman-Dixie or Approved Equal
PVC Couplings	JM Manufacturing, Harrington, Multi-Fittings or Approved Equal
PVC Pipe Class 200 or C900	Diamond, JM Manufacturing, Napco, Freedom, ETI, National, Pioneer or Approved Equal

MATERIAL/ITEM	APPROVED MANUFACTURER
Restraint Joint Collar Fittings	Mueller, McWayne, Ford, EBBA or Approved Equal
Service Tubing – Polyethylene Tubing (CTS Service Tubing)	Domestic
Service Tubing - Type K Copper Soft	Domestic
Steel Tapping Valves and Sleeves (Check Working Pressure)	Mueller, Kennedy, Ford or Approved Equal
Underground Blowoff Hydrant Assembly	Mueller Model No. A-412 or Approved Equal
Underground Detectable Tape	Shall be Lineguard brand encased aluminum foil, Type III. The identification tape is manufactured by Lineguard, Inc., P. O. Box 426, Wheaton, IL 60187 or Approved Equal

-END OF SECTION-

SECTION 01610

TRANSPORTATION AND HANDLING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Handling and Distribution:

1. The Contractor shall handle, haul, and distribute all materials and all surplus materials on the different portions of the work, as necessary or required; shall provide suitable and adequate storage room for materials and equipment during the progress of the work, and be responsible for the protection, loss of, or damage to materials and equipment furnished by him, until the final completion and acceptance of the work.

2. Storage and demurrage charges by transportation companies and vendors shall be borne by the Contractor.

B. Storage of Materials and Equipment: All excavated materials and equipment to be incorporated in the work shall be placed so as not to injure any part of the work or the existing facilities and so that free access can be had at all times to all parts of the work and to all public utility installations in the vicinity of the work. Materials and equipment shall be kept neatly piled and compactly stored in such locations as will cause a minimum of inconvenience to public travel and adjoining owners, tenants and occupants.

- END OF SECTION -

SECTION 01700

PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Liquidated Damages: General Provisions-11.20. CHARGES FOR DELAY CAUSED BY THE CONTRACTOR

B. Cleaning: Section 01710.

C. Project Record Documents: Section 01720.

1.02 SUBSTANTIAL COMPLETION

A. Contractor:

1. Submit written certification to Engineer that project is substantially complete.

2. Submit list of major items to be completed or corrected.

B. Engineer will make an inspection within seven days after receipt of certification, together with Owner's Representative.

C. Should Engineer consider that work is substantially complete:

1. Contractor shall prepare, and submit to Engineer, a list of items to be completed or corrected, as determined by the inspection.

2. Engineer will prepare and issue a Certificate of Substantial Completion, containing:

a. Date of Substantial Completion.

b. Contractor's list of items to be completed or corrected, verified and amended by Engineer.

c. The time within which Contractor shall complete or correct work of listed items.

d. Time and date Owner will assume possession of work or designated portion thereof.

e. Responsibilities of Owner and Contractor for:

(1) Insurance
(2) Utilities
(3) Operation of mechanical, electrical and other systems.
(4) Maintenance and cleaning.
(5) Security

f. Signatures of:

(1) Engineer.
(2) Contractor.
(3) Owner.

3. Owner occupancy of Project or Designated Portion of Project:

a. Contractor shall:

(1) Obtain certificate of occupancy.
(2) Perform final cleaning in accordance with Section 01710.

b. Owner will occupy Project, under provisions stated in Certificate of Substantial Completion.

4. Contractor shall complete work listed for completion or correction, within designated time.

D. Should Engineer consider that work is not substantially complete.

1. He shall immediately notify Contractor, in writing, stating reasons.

2. Contractor shall complete work, and send second written notice to Engineer, certifying that Project, or designated portion of Project is substantially complete.

3. Engineer will reinspect work.

1.03 FINAL INSPECTION

A. Contractor shall submit written certification that:

1. Contract Documents have been reviewed.

2. Project has been inspected for compliance with Contract Documents.

3. Work has been completed in accordance with Contract Documents.

4. Equipment and systems have been tested in presence of Owner's Representative and are operational.

5. Project is completed and ready for final inspection.

B. Engineer will make final inspection within seven (7) days after receipt of certification.

C. Should Engineer consider that work is finally complete in accordance with requirements of Contract Documents, he shall request Contractor to make Project Closeout submittals.

D. Should Engineer consider that work is not finally complete:

1. He shall notify Contractor, in writing, stating reasons.

2. Contractor shall take immediate steps to remedy the stated deficiencies, and send second written notice to Engineer certifying that work is complete.

3. Engineer will reinspect work.

1.04 FINAL CLEAN UP

The Work will not be considered as completed and final payment made until all final clean up has been done by the Contractor in a manner satisfactory to the Engineer. See Section 01710 for detailed requirements.

1.05 CLOSEOUT SUBMITTALS

Project Record Documents: To requirements of Section 01720.

1.06 FINAL APPLICATION FOR PAYMENT

Contractor shall submit final applications in accordance with requirements of GENERAL PROVISIONS.

1.07 FINAL CERTIFICATE FOR PAYMENT

A. Engineer will issue final certificate in accordance with provisions of GENERAL PROVISIONS.

B. Should final completion be materially delayed through no fault of Contractor, Engineer may issue a Semi-Final Certificate for Payment.

- END OF SECTION -

SECTION 01710

CLEANING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. During its progress the work and the adjacent areas affected thereby shall be kept cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.

B. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes, structures, by work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc., shall, upon completion of the work, be left in a clean and neat condition.

C. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary works, tools, and machinery or other construction equipment furnished by him; shall remove, acceptably disinfect, and cover all organic matter and material containing organics in, under, and around privies, houses, and other buildings used by him; shall remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.

D. The Contractor shall thoroughly clean all materials and equipment installed by him and his subcontractors, and on completion of the work shall deliver it undamaged and in fresh and new appearing condition.

E. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment, or employees, to a condition equal or better than that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.

1.02 DESCRIPTION

A. Related Requirements Specified Elsewhere:

1. Project Closeout: Section 01700.

2. Cleaning for Specific Products or Work: Specification Section for that work.

B. On a continuous basis, maintain premises free from accumulations of waste, debris, and rubbish, caused by operations.

C. At completion of Work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all sight-exposed surfaces; leave Project clean and ready for occupancy.

1.03 SAFETY REQUIREMENTS

A. Hazards Control:

1. Store volatile wastes in covered metal containers, and remove from premises daily.

2. Prevent accumulation of wastes, which create hazardous conditions.

3. Provide adequate ventilation during use of volatile or noxious substances.

B. Conduct cleaning and disposal operations in compliance with local ordinances and anti-pollution laws.

1. Do not burn or bury rubbish and waste materials on Project site without written permission from the Owner.

2. Do not dispose of volatile wastes such as mineral spirits, oil, or fuel in open drainage ditches or storm or sanitary drains.

3. Do not dispose of wastes into streams or waterways.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.

B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.01 DURING CONSTRUCTION

A. Execute cleaning to ensure that grounds and public properties are maintained free from accumulations of waste materials and rubbish.

B. Wet down dry materials and rubbish to minimize blowing dust.

C. At reasonable intervals during progress of Work, clean site and public properties, and dispose of waste materials, debris and rubbish.

D. Provide on-site containers for collection of waste materials, debris and rubbish.

E. Remove waste materials, debris and rubbish from site and legally dispose of at public or private dumping areas off construction site.

F. The Contractor shall thoroughly clean all materials and equipment installed.

3.02 FINAL CLEANING

A. Employ experienced workmen, or professional cleaners, for final cleaning.

B. In preparation for substantial completion, conduct final inspection of project area(s).

C. Broom clean paved surfaces; rake clean other surfaces of grounds.

D. Maintain cleaning until Project, or portion thereof, is accepted by Owner.

- END OF SECTION -

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 WORK INCLUDED

The Contractor shall obtain from the Engineer, one (1) set of prints of the Contract Drawings. These prints shall be kept and maintained in good condition at the project site and a qualified representative of the Contractor shall enter upon these prints, from day-to-day, the actual "as-built" record of the construction progress. Entries and notations shall be made in a neat and legible manner and these prints shall be delivered to the Engineer upon completion of the construction. APPROVAL FOR FINAL PAYMENT WILL BE CONTINGENT UPON COMPLIANCE WITH THIS PROVISION.

1.02 RELATED REQUIREMENTS SPECIFIED ELSEWHERE:

A. Section 01300 - Submittals.

B. General Provisions – O'Brien & Gere Engineers, Inc.

1.03 MAINTENANCE OF DOCUMENTS

A. Maintain at job site, one copy of:

1. Contract Drawings
2. Specifications
3. Addenda
4. Reviewed Shop Drawings
5. Change Orders
6. Other Modifications to Contract

B. Store documents in approved location, apart from documents used for construction.

C. Provide files and racks for storage of documents.

D. Maintain documents in clean, dry legible condition.

E. Do not use record documents for construction purposes.

F. Make documents available at all times for inspection by Engineer and Owner.

1.04 MARKING DEVICES

Provide colored pencil or felt-tip marking pen for all marking.

1.05 RECORDING

A. Label each document "PROJECT RECORD" in 2-inch high printed letters.

B. Keep record documents current.

C. Do not permanently conceal any work until required information has been recorded.

D. Contract Drawings: Legibly mark to record actual construction:

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

2. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.

3. Field changes of dimension and detail.

4. Changes made by Change Order or Field Order.

5. Details not on original Contract Drawings.

E. Specifications and Addenda: Legibly mark up 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 Change Order or Field Order.

3. Other matters not originally specified.

F. Shop Drawings: Maintain as record documents; legibly annotate Shop Drawings to record changes made after review.

1.06 SUBMITTAL

A. At completion of project, deliver record documents to Engineer.

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. Certification that each Document as Submitted is Complete and Accurate.

6. Signature of Contractor, or his authorized Representative.

- END OF SECTION -

SECTION 01730

OPERATING AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Compile product data and related information appropriate for Owner's maintenance and operation of equipment furnished under the contract. Prepare operating and maintenance data as specified.

B. Instruct Owner's personnel in the maintenance and operation of equipment and systems as outlined herein and/or in other Divisions.

C. In addition to maintenance and operations data, the manufacturer's printed recommended installation practice shall also be included. If not part of the operations and maintenance manual, separate written installation instructions shall be provided, serving to assist the Contractor in equipment installation.

D. Related Requirements Specified Elsewhere:

1. Section 01300 - Submittals.
2. Section 01700 - Project Closeout.
3. Section 01720 - Project Record Documents.
4. Section 01740 - Warranties and Bonds.
5. General Provisions

1.02 MAINTENANCE AND OPERATIONS MANUAL

Every piece of equipment furnished and installed shall be provided with complete maintenance and operations manuals. These shall be detailed in instructions to the Owner's personnel. They shall be attractively bound for the Owner's records.

The manuals shall be submitted to the Engineer for review as to adequacy and completeness. Provide three (3) copies each.

1.03 FORM OF SUBMITTALS

A. Prepare data in the form of an instructional manual for use by Owner's personnel.

B. Format:

1. Size: 8-1/2 x 11 in.
2. Paper: 20 pound minimum, white, for typed pages.
3. Text: Manufacturer's printed data, or neatly typewritten.
4. Drawings:

a. Provide reinforced punched binder tab, bind with text.

b. Fold large drawings to the size of the text pages where feasible.

c. For all drawings included within manuals, furnish a 3 mil mylar copy in standard size drawings 36" x 24", 8" x 16" or 8-1/2" x 11".

d. For flow or piping diagrams that cannot be detailed on the standard size drawings, a larger, appropriate size drawing may be submitted.

5. Provide fly-leaf for each separate product, or each piece of operating equipment.

a. Provide typed description of product, and major component parts of equipment.

b. Provide indexed tabs.

6. Cover: Identify each volume with types or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS". List:

a. Title of Project.

b. Identity of separate structure as applicable.

c. Identity of general subject matter covered in the manual.

C. Binders:

1. Commercial quality, durable and cleanable, 3-hole, 3" or 4" post type binders, with oil and moisture resistant hard covers.

2. When multiple binders are used, correlate the data into related consistent grouping.

3. Labeled on the front cover and side of each binder shall be the name of the Project, the Contract Number and Volume Number.

1.04 CONTENT OF MANUAL

A. Neatly typewritten table of contents for each volume, arranged in systematic order.

1. Contractor, name of responsible principal, address and telephone number.

2. A list of each product required to be included, indexed to the content of the volume.

3. List, with each product, the name, address and telephone number of:

a. Subcontractor or installer.

b. Maintenance contractor, as appropriate.

c. Identify the area of responsibility of each.

d. Local source of supply for parts and replacement.

4. Identify each product by product name and other identifying symbols as set forth in Contract Documents.

B. Product Data:

1. Include only those sheets which are pertinent to the specific product. References to other sizes and types or models of similar equipment shall be deleted or lined out.

2. Annotate each sheet to:

   a. Clearly identify the specific product or part installed.

   b. Clearly identify the data applicable to the installation.

   c. Provide a parts list for all new equipment items, with catalog numbers and other data necessary for ordering replacement parts.

   d. Delete references to inapplicable information.

3. Clear and concise instructions for the operation, adjustment, lubrication, and other maintenance of the equipment including a lubrication chart.

C. Drawings:

1. Supplement product data with drawings as necessary to clearly illustrate:

   a. Relations of component parts of equipment and systems.

   b. Control and flow diagrams.

2. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.

3. Do not use Project Record Documents as maintenance drawings.

D. Written text, as required to supplement product data for the particular installation:

1. Organize in a consistent format under separate headings for different procedures.

2. Provide a logical sequence of instructions for each procedure.

E. Copy of each warranty, bond and service contract issued: Provide information sheet for Owner's personnel.

1. Proper procedures in the event of failure.

2. Instances which might affect the validity of warranties or bonds.

F. These manuals shall be delivered to the Engineer at the time designated by the Engineer. The manuals must be approved by the Engineer before final payment on the equipment is made.

- END OF SECTION -

SECTION 01740

WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Compile specified warranties and bonds.

B. Compile specified service and maintenance contracts.

C. Co-execute submittals when so specified.

D. Review submittals to verify compliance with Contract Documents.

E. Related requirements specified elsewhere:

1. Bid Bond: Instructions to Bidders.
2. Performance and Payment Bonds: General Provisions.
3. Guaranty: General Provisions.
4. General Warranty of Construction: General Provisions.
5. Project Closeout: Section 01700.
6. Warranties and Bonds required for specific products: As listed herein.
7. Provisions of Warranties and Bonds, Duration: Respective specification sections for particular products.
8. Operating and Maintenance Data: Section 01730.

1.02 SUBMITTALS REQUIREMENTS

A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers and subcontractors.

B. Furnish two (2) original signed copies.

C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.

1. Product, equipment or work item.
2. Firm name, address and telephone number.
3. Scope
4. Date of beginning of warranty, bond or service and maintenance contract.
5. Duration of warranty, bond or service and maintenance contract.

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, address and telephone number.

1.03 FORM OF SUBMITTALS

A. Prepare in duplicate packets.

B. Format:

1. Size 8-1/2 in. x 11 in., punch sheets for 3-ring binder: Fold larger sheets to fit into binders.

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-ring, with durable and cleanable plastic covers.

1.04 TIME OF SUBMITTALS

A. For equipment or component parts of equipment put into service during progress of construction: Submit documents within 10 days after inspection and acceptance.

B. Otherwise, make submittals within 10 days after date of substantial completion, prior to final request for payment.

C. For items of work, where acceptance is delayed materially beyond the Date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing the date of acceptance as the start of the warranty period.

1.05 SUBMITTALS REQUIRED

Submit warranties, bonds, service and maintenance contracts as specified in the respective sections of the Specifications.

- END OF SECTION -

DIVISION 2

SITE WORK

SECTION 02110

SITE CLEARING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Clear site within construction limits of plant life.

B. Remove grass and topsoil in area of access road and foundation.

C. Remove root system of trees and shrubs.

D. Remove surface debris

1.02 RELATED WORK

A. Section 02228 - Rock Removal.

B. Section 02211 - Rough Grading.

C. Section 02222 - Excavation.

1.03 REGULATORY REQUIREMENTS

Conform to applicable local codes and ordinances for disposal of debris.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 CLEARING

A. Clear areas required for access to site and execution of work.

B. Remove trees, shrubs, brush, and other vegetable matter such as snags, bark, and refuse.

3.02 PROTECTION

The Contractor shall not cut or injure any trees or other vegetation outside the easement lines and outside the areas to be cleared, as indicated on the Drawings, without written permission from the Engineer. The Contractor shall be responsible for all damage done outside these lines.

3.03 GRUBBING

From areas to be grubbed, the Contractor shall remove completely all stumps, remove to a depth of at least 24 inches below subgrade elevation all roots larger than 1 1/2 in. in diameter, and remove to a depth of 12 in. all roots larger than 1/2 in. in diameter. Such depths shall be measured from the existing ground surface, the proposed finished grade or subgrade, whichever is lower.

3.04 STRIPPING

All stumps, roots, foreign matter, topsoil, loam, and unsuitable earth shall be stripped from the ground surface. The topsoil and loam shall be utilized insofar as possible, for finished surfacing. Loam shall not be taken from the site.

3.05 DISPOSAL

A. All material resulting from clearing and grubbing and not scheduled for reuse or stockpiling shall become the property of the Contractor and shall be suitably disposed of off site, unless otherwise directed by the Engineer, in accordance with all applicable laws, ordinances, rules and regulations.

B. Such disposal shall be performed as promptly as possible after removal of the material and shall not be left until the final period of cleaning up.

3.06 FENCES

Wherever fences need to be removed to provide access to the work or are damaged during the progress of work, they shall be restored or repaired to as good a condition as existed prior to construction at the Contractor's expense.

- END OF SECTION -

SECTION 02211

ROUGH GRADING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Remove topsoil and stockpile for later reuse.

B. Excavate subsoil and stockpile for later reuse as directed in Section 022110, Backfilling and Embankments.

C. Grade and rough contour site.

1.02 RELATED WORK

A. Geotechnical data as indicated in Appendix A of the specifications. (None provided or available for this Contract)

B. Section 02228 - Rock Removal.

C. Section 02222 - Excavation.

D. Section 02220 – Earthwork.

1.03 PROJECT RECORD DOCUMENTS

A. Submit documents under provisions of Section 01720.

B. Accurately record location of utilities remaining, rerouted utilities, new utilities by horizontal dimensions, elevations or inverts, and slope gradients.

1.04 PROTECTION

A. Protect trees and other features remaining as portion of final landscaping.

B. Protect bench marks, existing structures, fences, roads, sidewalks and other features not designated for demolition.

C. Protect above or below grade utilities which are to remain.

D. Contractor shall be responsible for repairing any damage to those items not designated for demolition or removal in a manner satisfactory to the Owner at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Topsoil: Excavated material, graded free of roots, rocks larger than one inch, subsoil, debris, and large weeds.

B. Subsoil: Excavated material, graded free of lumps larger than 12 inches, rocks larger than 12 inches, and debris.

PART 3 - EXECUTION

3.01 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Identify known below grade utilities. Stake and flag locations.

C. Identify and flag above grade utilities.

D. Maintain and protect existing utilities remaining which pass through work area.

E. Upon discovery of unknown utility or concealed conditions, discontinue affected work; notify Engineer.

3.02 TOPSOIL EXCAVATION

A. Excavate topsoil from areas to be further excavated, and stockpile in area designated on site by the Engineer.

B. Do not excavate wet topsoil.

C. Stockpile topsoil to depth not exceeding 8 feet.

3.03 SUBSOIL EXCAVATION

A. Excavate subsoil from indicated areas and stockpile in area designated on site. Excess subsoil may be reused according to Section 02220, Backfilling.

B. Do not excavate wet subsoil.

C. Stockpile subsoil to depth not exceeding 8 feet.

D. When excavation through roots is necessary, perform work by hand and cut roots with a sharp axe.

3.04 TOLERANCES

Top Surface of Subgrade: Plus or minus three inches.

- END OF SECTION -

SECTION 02220

EARTHWORK

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes excavation and backfilling including the loosening, removing, refilling, transporting, storage and disposal of all materials classified as "earth" necessary to be removed for the construction and completion of all work under the Contract, and as shown on the Contract Drawings, specified or directed.

1.02 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards, and specifications, except where more stringent requirements have been specified herein:

1. American Society for Testing and Materials (ASTM)

   a. A328 Specification for Steel Sheet Piling

   b. D698 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600 kN-m/m^3)

   c. D1556 Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

   d. D1760 Specification for Pressure Treatment of Timber Products

   e. D2922 Test Methods for Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth)

1.03 DEFINITIONS

A. Excavation (or Trenching)

1. Grubbing, stripping, removing, storing and rehandling of all materials of every name and nature necessary to be removed for all purposes incidental to the construction and completion of all the work under construction.

2. All sheeting, sheetpiling, bracing and shoring, and the placing, driving, cutting off and removing of the same.

3. All diking, ditching, fluming, cofferdamming, pumping, bailing, draining, well pointing, or otherwise disposing of water.

4. The removing and disposing of all surplus materials from the excavations in the manner specified.

5. The maintenance, accommodation and protection of travel and the temporary paving of highways, roads and driveways.

6. The supporting and protecting of all tracks, rails, buildings, curbs, sidewalks, pavements, overhead wires, poles, trees, vines, shrubbery, pipes, sewers, conduits or other structures or property in the vicinity of the work, whether over- or underground or which appear within or adjacent to the excavations, and the restoration of the same in case of settlement or other injury.

7. All temporary bridging and fencing and the removing of same.

B. Earth

1. All materials such as sand, gravel, clay, loam, ashes, cinders, pavements, muck, roots or pieces of timber, soft or disintegrated rock, not requiring blasting, barring, or wedging from their original beds, and specifically excluding all ledge or bedrock and individual boulders or masonry larger than one-half cubic yard in volume.

C. Backfill

1. The refilling of excavation and trenches to the line of filling indicated on the Contract Drawings or as directed using materials suitable for refilling of excavations and trenches; and the compacting of all materials used in filling or refilling by rolling, ramming, watering, puddling, etc., as may be required.

D. Spoil

1. Surplus excavated materials not required or not suitable for backfills or embankments.

E. Embankments

1. Fills constructed above the original surface of the ground or such other elevation as specified or directed.

F. Limiting Subgrade

1. The underside of the pipe barrel for pipelines
2. The underside of footing lines for structures

G. Excavation Below Subgrade

1. Excavation below the limiting subgrades of structures or pipelines.

2. Where materials encountered at the limiting subgrades are not suitable for proper support of structures or pipelines, the Contractor shall excavate to such new lines and grades as required.

PART 2 PRODUCTS

2.01 MATERIALS AND CONSTRUCTION

A. Wood Sheeting and Bracing

1. Shall be sound and straight; free from cracks, shakes and large or loose knots; and shall have dressed edges where directed.

2. Shall conform to National Design Specifications for Stress Grade Lumber having a minimum fiber stress of 1200 pounds per square inch.

3. Sheeting and bracing to be left-in-place shall be pressure treated in accordance with ASTM D1760 for the type of lumber used and with a preservative approved by the Engineer.

B. Steel Sheeting and Bracing

1. Shall be sound

2. Shall conform to ASTM A328 with a minimum thickness of 3/8 inch.

PART 3 EXECUTION

3.01 UNAUTHORIZED EXCAVATION

A. Whenever excavations are carried beyond or below the lines and grades shown on the Contract Drawings, or as given or directed by the Engineer, all such excavated space shall be refilled with special granular materials, concrete or other materials as the Engineer may direct. All refilling of unauthorized excavations shall be at the Contractor's expense.

B. All material which slides, falls or caves into the established limits of excavations due to any cause whatsoever, shall be removed and disposed of at the Contractor's expense and no extra compensation will be paid the Contractor for any materials ordered for refilling the void areas left by the slide, fall or cave-in.

3.02 REMOVAL OF WATER

A. General

1. The Contractor shall at all times provide and maintain proper and satisfactory means and devices for the removal of all water entering the excavations, and shall remove all such water as fast as it may collect, in such manner as shall not interfere with the prosecution of the work or the proper placing of pipes, structures, or other work.

2. Unless otherwise specified, all excavations which extend down to or below the static groundwater elevations shall be dewatered by lowering and maintaining the groundwater beneath such excavations at all times when work thereon is in progress, during subgrade preparation and the placing of the structure or pipe thereon.

3. Water shall not be allowed to rise over or come in contact with any masonry, concrete or mortar, until at least 24 hours after placement, and no stream of water shall be allowed to flow over such work until such time as the Engineer may permit.

4. Where the presence of fine grained subsurface materials and a high groundwater table may cause the upward flow of water into the excavation with a resulting quick or unstable condition, the Contractor shall install and operate a well point system to prevent the upward flow of water during construction.

5. Water pumped or drained from excavations, or any sewers, drains or water courses encountered in the work, shall be disposed of in a suitable manner without injury to adjacent property, the work under construction, or to pavements, roads, drives, and

water courses. No water shall be discharged to sanitary sewers. Sanitary sewage shall be pumped to sanitary sewers or shall be disposed of by an approved method.

6. Any damage caused by or resulting from dewatering operations shall be the sole responsibility of the Contractor.

B. Work Included

1. The construction and removal of cofferdams, sheeting and bracing, and the furnishing of materials and labor necessary therefor.

2. The excavation and maintenance of ditches and sluiceways.

3. The furnishing and operation of pumps, well points, and appliances needed to maintain thorough drainage of the work in a satisfactory manner.

C. Well Point Systems

1. Installation

a. The well point system shall be designed and installed by or under the supervision of an organization whose principal business is well pointing and which has at least five consecutive years of similar experience and can furnish a representative list of satisfactory similar operations.

b. Well point headers, points and other pertinent equipment shall not be placed within the limits of the excavation in such a manner or location as to interfere with the laying of pipe or trenching operations or with the excavation and construction of other structures.

c. Detached observation wells of similar construction to the well points shall be installed at intervals of not less than 50 feet along the opposite side of the excavation from the header pipe and line of well points, to a depth of at least 5 feet below the proposed excavation. In addition, one well point in every 50 feet shall be fitted with a tee, plug and valve so that the well point can be converted for use as an observation well. Observation wells shall be not less than 1-½ inches in diameter.

d. Standby gasoline or diesel powered equipment shall be provided so that in the event of failure of the operating equipment, the standby equipment can be readily connected to the system. The standby equipment shall be maintained in good order and actuated regularly not less than twice a week.

2. Operation

a. Where well points are used, the groundwater shall be lowered and maintained continuously (day and night) at a level not less than 2 feet below the bottom of the excavation. Excavation will not be permitted at a level lower than 2 feet above the water level as indicated by the observation wells.

b. The effluent pumped from the well points shall be examined periodically by qualified personnel to determine if the system is operating satisfactorily without the removal of fines.

c. The water level shall not be permitted to rise until construction in the immediate area is completed and the excavation backfilled.

3.03 STORAGE OF MATERIALS

A. Sod

1. Any sod cut during excavation shall be removed and stored during construction so as to preserve the grass growth. Sod damaged while in storage shall be replaced in like kind at the sole expense of the Contractor.

B. Topsoil

1. Topsoil suitable for final grading shall be removed and stored separately from other excavated material.

C. Excavated Materials

1. All excavated materials shall be stored in locations so as not to endanger the work, and so that easy access may be had at all times to all parts of the excavation. Stored materials shall be kept neatly piled and trimmed, so as to cause as little inconvenience as possible to public travel or to adjoining property holders.

2. Special precautions must be taken to permit access at all times to fire hydrants, fire alarm boxes, police and fire department driveways, and other points where access may involve the safety and welfare of the general public.

3.

3.04 DISPOSAL OF MATERIALS

A. Spoil Material

1. All spoil materials shall be disposed of as required by the local, state or federal regulations pertaining to the area or as described in the Special Provisions or on the Contract Drawings.

2. The surface of all spoil areas shall be graded and dressed and no unsightly mounds or heaps shall be left on completion of the work.

3.05 SHEETING AND BRACING

A. Installation

1. The Contractor shall furnish, place and maintain such sheeting, bracing and shoring as may be required to support the sides and ends of excavations in such manner as to prevent any movement which could, in any way, injure the pipe, structures, or other work; diminish the width necessary for construction; otherwise damage or delay the work of the Contract; endanger existing structures, pipes or pavements; or cause the excavation limits to exceed the right-of-way limits.

2. In no case will bracing be permitted against pipes or structures in trenches or other excavations.

3. Sheeting shall be driven as the excavation progresses, and in such manner as to maintain pressure against the original ground at all times. The sheeting shall be driven vertically with the edges tight together, and all bracing shall be of such design and strength as to maintain the sheeting in its proper position. Seepage which carries fines through the sheeting shall be plugged to retain the fines.

4. Where breast boards are used between soldier pile, the boards shall be back packed with soil to maintain support.

5. The Contractor shall be solely responsible for the adequacy of all sheeting and bracing.

B. Removal

1. In general, all sheeting and bracing, whether of steel, wood or other material, used to support the sides of trenches or other open excavations, shall be withdrawn as the trenches or other open excavations are being refilled. That portion of the sheeting extending below the top of a pipe or structural foundation shall not be withdrawn, unless otherwise directed, before more than 6 inches of earth is placed above the top of the pipe or structural foundation and before any bracing is removed. The voids left by the sheeting shall be carefully refilled with selected material and rammed tight with tools especially adapted for the purpose or otherwise as may be approved.

2. The Contractor shall not remove sheeting and bracing until the work has attained the necessary strength to permit placing of backfill.

C. Left in Place

1. If, to serve any purpose of his own, the Contractor files a written request for permission to leave sheeting or bracing in the trench or excavation, the Engineer may grant such permission, in writing, on condition that the cost of such sheeting and bracing be assumed and paid by the Contractor.

2. The Contractor shall leave in place all sheeting, shoring and bracing which are shown on the Contract Drawings or specified to be left in place or which the Engineer may order, in writing, to be left in place. All shoring, sheeting and bracing shown or ordered to be left in place will be paid for under the appropriate item of the Contract. No payment allowance will be made for wasted ends or for portions above the proposed cutoff level which are driven down instead of cut-off.

3. In case sheeting is left in place, it shall be cut off or driven down as directed so that no portion of the same shall remain within 12 inches of the street subgrade or finished ground surface.

3.06 BACKFILLING

A. General

1. All excavations shall be backfilled to the original surface of the ground or to such other grades as may be shown, specified or directed.

2. Backfilling shall be done with suitable excavated materials which can be satisfactorily compacted during refilling of the excavation. In the event the excavated materials are not suitable, Special Backfill as specified or ordered by the Engineer shall be used for backfilling.

4. Any settlement occurring in the backfilled excavations shall be refilled and compacted.

B. Unsuitable Materials

1. Stones, pieces of rock or pieces of pavement greater than 1 cubic foot in volume or greater than 1.5 feet in any single dimension shall not be used in any portion of the backfill.

2. All stones, pieces of rock or pavement shall be distributed through the backfill and alternated with earth backfill in such a manner that all interstices between them shall be filled with earth.

3. Frozen earth shall not be used for backfilling.

C. Compaction and Density Control

1. The compaction shall be as specified for the type of earthwork, i.e., structural, trenching or embankment.

a. The compaction specified shall be the percent of maximum dry density.

b. The compaction equipment shall be suitable for the material encountered.

2. Where required, to assure adequate compaction, in-place density test shall at the expense of the Contractor be made by an approved testing laboratory.

a. The moisture-density relationship of the backfill material shall be determined by ASTM D698, Method D.

1) Compaction curves for the full range of materials used shall be developed.

b. In-place density shall be determined by the methods of ASTM D1556 or ASTM D2922 and shall be expressed as a percentage of maximum dry density.

3. Where required, to obtain the optimum moisture content, the Contractor shall add, at his expense, sufficient water during compaction to assure the specified maximum density of the backfill. If, due to rain or other causes, the material exceeds the optimum moisture content, it shall be allowed to dry, assisted if necessary, before resuming compaction or filling efforts.

4. The Contractor shall be responsible for all damage or injury done to pipes, structures, property or persons due to improper placing or compacting of backfill.

3.07 OTHER REQUIREMENTS

A. Drainage

1. All material deposited in roadway ditches or other water courses shall be removed immediately after backfilling is completed and the section, grades and contours of such ditches or water courses restored to their original condition, in order that surface drainage will be obstructed no longer than necessary.

B. Unfinished Work

1. When, for any reason, the work is to be left unfinished, all trenches and excavations shall be filled and all roadways, sidewalks and watercourses left unobstructed with their surfaces in a safe and satisfactory condition. The surface of all roadways and sidewalks shall have a temporary pavement.

C. Hauling Material on Streets

1. When it is necessary to haul material over the streets or pavements, the Contractor shall provide suitable tight vehicles so as to prevent deposits on the streets or pavements. In all cases where any materials are dropped from the vehicles, the Contractor shall clean up the same as often as required to keep the crosswalks, streets and pavements clean and free from dirt, mud, stone and other hauled material.

D. Dust Control

1. It shall be the sole responsibility of the Contractor to control the dust created by any and all of his operations to such a degree that it will not endanger the safety and welfare of the general public.

2. Calcium chloride and petroleum products shall not to be used for dust control.

E. Test Pits

1. For the purpose of obtaining detail locations of underground obstructions, the Contractor shall make excavations in advance of the work. Payment for the excavations ordered by the Engineer will be made under an appropriate item of the Contract and shall include sheeting, bracing, pumping, excavation and backfilling.

- END OF SECTION -

SECTION 02222

EXCAVATION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Structure excavation.

B. Shoring excavations.

1.02 RELATED WORK

A. Geotechnical Report in Appendix A of these specifications. (None provided or available for this Contract)

B. Section 01450 - Quality Control.

C. Section 02228 - Rock Removal.

D. Section 02211 - Rough Grading.

E. Section 02220 - Backfilling and Embankments.

F. Section 02226 - Trenching.

1.03 REGULATORY REQUIREMENTS

A. Protect excavations by shoring, bracing, sheet piling, underpining, or other methods required to prevent cave-in or loose soil from falling into excavation.

B. Underpin adjacent structures which may be damaged by excavation work, including service utilities and pipe chases.

C. Notify Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.

D. Protect bottom of excavations and soil adjacent to and beneath foundations from frost.

E. Grade excavation top perimeter to prevent surface water run-off into excavation.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Subsoil: Excavated material, graded free of lumps larger than 12 inches, rocks larger than 12 inches, and debris.

B. # 57's or # 9's: Mineral aggregate graded 1/4 inch to 5/8 inch, free of soil, subsoil, clay, shale, or foreign matter.

PART 3 - EXECUTION

3.01 PREPARATION

Identify required liens, levels, contours, and datum.

3.02 EXCAVATION

A. Excavate subsoil required for structure foundations, construction operations, and other work. All excavation shall be unclassified excavation.

B. Contractor is responsible to adequately brace open cuts and protect workmen and equipment from cave-in.

C. Remove lumped subsoil, boulders, and rock up to 1/3 cu. yd., measured by volume. Remove larger material under Section 02228.

D. Correct unauthorized excavation at no cost to Owner.

E. Fill over-excavated areas under structure bearing surfaces in accordance with direction by Engineer.

F. Stockpile excavated material in area designated on site.

3.03 FIELD QUALITY CONTROL

Provide for visual inspection of rock surfaces under provisions of Section 01450.

- END OF SECTION -

SECTION 02226

TRENCHING, BACKFILLING AND COMPACTING

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes excavation and backfill as required for pipe installation or other construction in the trench, and removal and disposal of water, in accordance with the applicable provisions of the Section entitled "Earthwork" unless modified herein.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 EXCAVATION

A. The trench excavation shall be located as shown on the Contract Drawings or as specified. Under ordinary conditions, excavation shall be by open cut from the ground surface. Where the depth of trench and soil conditions permit, tunneling may be required beneath cross walks, curbs, gutters, pavements, trees, driveways, railroad tracks and other surface structures. No additional compensation will be allowed for such tunneling over the price bid for open cut excavation of equivalent depths below the ground surface unless such tunnel excavation is specifically provided for in the Contract Documents.

B. Trenches shall be excavated to maintain the depths as shown on the Contract Drawings or as specified for the type of pipe to be installed.

C. The alignment and depth shall be determined and maintained by the use of a string line installed on batter boards above the trench, a double string line installed along side of the trench or a laser beam system.

D. The minimum width of trench excavation shall be 6-inches on each side of the pipe hub for 21-inch diameter pipe and smaller and 12-inches on each side of the pipe hub for 24-inch diameter pipe and larger.

E. Trenches shall not be opened for more than 300 feet in advance of pipe installation nor left unfilled for more than 100 feet in the rear of the installed pipe when work is in progress without the consent of the Engineer. Open trenches shall be protected and barricaded as required.

F. Bridging across open trenches shall be constructed and maintained where required.

3.02 SUBGRADE PREPARATION FOR PIPE

A. Where pipe is to be laid on undisturbed bottom of excavated trench, mechanical excavation shall not extend lower than the finished subgrade elevation at any point.

B. Where pipe is to be laid on special granular material the excavation below subgrade shall be to the depth specified or directed. The excavation below subgrade shall be refilled with

special granular material as specified or directed, shall be deposited in layers not to exceed 6 inches and shall be thoroughly compacted prior to the preparation of pipe subgrade.

C. The subgrade shall be prepared by shaping with hand tools to the contour of the pipe barrel to allow for uniform and continuous bearing and support on solid undisturbed ground or embedment for the entire length of the pipe.

D. Pipe subgrade preparation shall be performed immediately prior to installing the pipe in the trench. Where bell holes are required they shall be made after the subgrade preparation is complete and shall be only of sufficient length to prevent any part of the bell from becoming in contact with the trench bottom and allowing space for joint assembly.

3.03 STORAGE OF MATERIALS

A. Traffic shall be maintained at all times in accordance with the applicable Highway Permits. Where no Highway Permit is required at least one-half of the street must be kept open for traffic.

B. Where conditions do not permit storage of materials adjacent to the trench, the material excavated from a length as may be required, shall be removed by the Contractor, at his cost and expense, as soon as excavated. The material subsequently excavated shall be used to refill the trench where the pipe had been built, provided it be of suitable character. The excess material shall be removed to locations selected and obtained by the Contractor.

1. The Contractor shall, at his cost and expense, bring back adequate amounts of satisfactory excavated materials as may be required to properly refill the trenches.

C. If directed by the Engineer, the Contractor shall refill trenches with select fill or other suitable materials and excess excavated materials shall be disposed of as spoil.

3.04 REMOVAL OF WATER AND DRAINAGE

A. The Contractor shall at all times provide and maintain proper and satisfactory means and devices for the removal of all water entering the trench, and shall remove all such water as fast as it may collect, in such manner as shall not interfere with the prosecution of the work.

B. The removal of water shall be in accordance with the Section entitled "Earthwork".

3.05 PIPE EMBEDMENT

A. All pipe shall be protected from lateral displacement and possible damage resulting from superimposed backfill loads, impact or unbalanced loading during backfilling operations by being adequately embedded in suitable pipe embedment material. To ensure adequate lateral and vertical stability of the installed pipe during pipe jointing and embedment operations, a sufficient amount of the pipe embedment material to hold the pipe in rigid alignment shall be uniformly deposited and thoroughly compacted on each side, and back of the bell, of each pipe as laid.

B. Concrete cradle and encasement of the class specified shall be installed where and as shown on the Contract Drawings or ordered by the Engineer. Before any concrete is placed, the pipe shall be securely blocked and braced to prevent movement or flotation. The concrete cradle or encasement shall extend the full width of the trench as excavated unless otherwise authorized by the Engineer. Where concrete is to be placed in a sheeted trench it shall be poured directly against sheeting to be left in place or against a bond-breaker if the sheeting is to be removed.

C. Embedment materials placed above the centerline of the pipe or above the concrete cradle to a depth of 12 inches above the top of the pipe barrel shall be deposited in such manner as to

not damage the pipe. Compaction shall be as required for the type of embedment being installed.

3.06 BACKFILL ABOVE EMBEDMENT

A. The remaining portion of the pipe trench above the embedment shall be refilled with suitable materials compacted as specified.

1. Where trenches are within the ditch-to-ditch limits of any street or road or within a driveway or sidewalk, or shall be under a structure, the trench shall be refilled in horizontal layers not more than 8 inches in thickness, and compacted to obtain 95% maximum density, and determined as set forth in the Section entitled "Earthwork".

2. Where trenches are in open fields or unimproved areas outside of the ditch limits of roads, the backfilling may be by placing the material in the trench and mounding the surface.

3. Hand tamping shall be required around buried utility lines or other subsurface features that could be damaged by mechanical compaction equipment.

B. Backfilling of trenches beneath, across or adjacent to drainage ditches and water courses shall be done in such a manner that water will not accumulate in unfilled or partially filled trenches and the backfill shall be protected from surface erosion by adequate means.

1. Where trenches cross waterways, the backfill surface exposed on the bottom and slopes thereof shall be protected by means of stone or concrete rip-rap or pavement.

C. All settlement of the backfill shall be refilled and compacted as it occurs.

D. Temporary pavement shall be placed as specified in the Section entitled "Restoration of Surfaces".

-END OF SECTION-

SECTION 02228

ROCK REMOVAL

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes removal to the widths and depths shown on the Contract Drawings or as directed by the Engineer, including the loosening, removing, transporting, storing and disposal of all materials requiring blasting, barring, or wedging for removal from their original beds, and backfill of rock excavations with acceptable materials

B. Use of explosives for rock removal shall be used only with prior permission from both the Engineer and Owner.

C. Rock removal is part of and incidental to unclassified excavation. No separate payment shall be made for rock removal.

1.02 SUBMITTALS

A. In addition to those submittals identified in the General Provisions, the following items shall be submitted:

1. Before any blasting operations begin the Contractor shall obtain all permits and licenses required.

1.03 DEFINITIONS

A. Rock

1. All pieces of ledge or bedrock, boulders or masonry larger than one-half cubic yard in volume.

2. Any material requiring blasting, barring, or wedging for removal from its original bed.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 BLASTING **(Use of explosives for rock removal shall be used only with prior permission from both the Engineer and Owner.)**

A. General

1. Handling of explosives and blasting shall be done only by experienced persons.

2. Handling and blasting shall be in accordance with all Federal, State and local laws, rules and regulations relating to the possession, handling, storage and transportation and use of explosives.

3. All blasts in open cut shall be properly covered and protected with approved blasting mats.

4. Charges shall be of such size that the excavation will not be unduly large and shall be so arranged and timed that adjacent rock, upon or against which pipelines or structures are to be built, will not be shattered.

5. Blasting will not be permitted within 25 feet of pipelines or structures.

6. All existing pipes or structures exposed during excavation shall be adequately protected from damage before proceeding with the blasting.

7. NFPA 495 - Code for Manufacture, Transportation, Storage and Use of Explosive Materials.

8. Commonwealth of Kentucky Department of Mines and Minerals, Laws and Regulations Governing Explosives and Blasting.

B. Repair of Damages Due to Blasting

1. Any injury or damage to the work or to existing pipes or structures shall be repaired or rebuilt by the Contractor at his expense.

2. Whenever blasting may damage adjacent rock, pipes or structures, blasting shall be discontinued and the rock removed by drilling, barring, wedging or other methods.

C. Explosives

1. At no time shall an excessive amount of explosives be kept at the site of the work. Such explosives shall be stored, handled and used in conformity with all applicable laws and regulations.

2. Accurate daily records shall be kept showing the amounts of explosives on hand, both at the site and at any storage magazine, the quantities received and issued, and the purpose for which issued.

3. The Contractor shall be responsible for any damage or injury to any persons, property or structures as a result of his handling, storage or use of explosives.

D. Rock Clearance in Trenches

1. Ledge rock, boulders and large stones shall be removed from the sides and bottom of the trench to provide clearance for the specified embedment of each pipe section, joint or appurtenance; but in no instance shall the clearance be less than 6 inches. Additional clearance at the pipe bell or joint shall be provided to allow for the proper make-up of the joint.

2. At the transition from an earth bottom to a rock bottom the minimum bottom clearance shall be 12 inches for a distance of not less than 5 feet.

E. Rock Clearance at Structures

1. Concrete for structures shall be placed directly on the rock and the excavation shall be only to the elevations and grades shown on the Contract Drawings.

3.02 EXCAVATION AND BACKFILL

A. Rock removal and backfilling shall be performed in accordance with the applicable provisions of the Section entitled "Earthwork".

B. The rock excavated which cannot be incorporated into the backfill material, as specified, shall be disposed of as spoil and shall be replaced with the quantity of acceptable material required for backfilling.

-END OF SECTION-

SECTION 02270

SLOPE PROTECTION AND EROSION CONTROL

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The Contractor shall do all work and take all measures necessary to control soil erosion resulting from construction operations, shall prevent the flow of sediment from the construction site, and shall contain construction materials (including excavation and backfill) within his protected working area so as to prevent damage to adjacent property.

B. The Contractor shall not employ any construction method that violates a rule, regulation, guideline or procedure established by Federal, State or local agencies having jurisdiction over the environmental effects of construction. The Contractor shall be responsible for obtaining all associated permits.

C. Pollutants such as chemicals, fuels, lubricants, bitumen, raw sewage and other harmful waste shall not be discharged into or alongside of any body of water or into natural or man-made channels leading thereto.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Temporary Slope Protection and Erosion Control:

Bales may be hay or straw, and shall be reasonably clean and free of noxious weeds and deleterious materials. Filter fabric for sediment traps shall be of suitable materials acceptable to the Engineer.

B. Permanent Slope Protection and Erosion Control:

On slopes 2H:1V and steeper, and where shown on the drawings place Type A Dumped Rock Fill with a 24-inch minimum thickness over non-woven geotextile filter fabric.

PART 3 - EXECUTION

3.01 METHODS OF CONSTRUCTION

A. The Contractor shall use any of the acceptable methods necessary to control soil erosion and prevent the flow of sediment to the maximum extent possible. These methods shall include, but not be limited to, the use of water diversion structures, diversion ditches and settling basins.

B. Construction operations shall be restricted to the areas of work indicated on the Drawings and to the area which must be entered for the construction of temporary or permanent facilities. The Engineer has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and fill operations and to direct the Contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of the wetlands and adjacent watercourses. Such work may involve the construction of temporary berms, dikes, dams, sediment basins, slope drains, and use of temporary mulches, mats, or other control devices or methods as necessary to control erosion.

C. Excavated soil material shall not be placed adjacent to the wetlands or watercourses in a manner that will cause it to be washed away by high water or runoff. Earth berms or diversions shall be constructed to intercept and

divert runoff water away from critical areas. Diversion outlets shall be stable or shall be stabilized by means acceptable to the Engineer. If for any reason construction materials are washed away during the course of construction, the Contractor shall remove those materials from the fouled areas as directed by the Engineer.

D. For work within easements, all materials used in construction such as excavation, backfill, roadway, and pipe bedding and equipment shall be kept within the limits of the easements.

E. The Contractor shall not pump silt-laden water from trenches or other excavations into the wetlands, or adjacent watercourses. Instead, silt-laden water from his excavations shall be discharged within areas surrounded by baled hay or into sediment traps to ensure that only sediment-free water is returned to the watercourses. Damage to vegetation by excessive watering or silt accumulation in the discharge area shall be avoided.

F. Prohibited construction procedures include, but are not limited to, the following:

1. Dumping of spoil material into any streams, wetlands, surface waters, or unspecified locations.

2. Indiscriminate, arbitrary, or capricious operation of equipment in wetlands or surface waters.

3. Pumping of silt-laden water from trenches or excavations into surface waters, or wetlands.

4. Damaging vegetation adjacent to or outside of the construction area limits.

5. Disposal of trees, brush, debris, paints, chemicals, asphalt products, concrete curing compounds, fuels, lubricants, insecticides, washwater from concrete trucks or hydroseeders, or any other pollutant in wetlands, surface waters, or unspecified locations.

6. Permanent or unauthorized alteration of the flow line of any stream.

7. Open burning of debris from the construction work.

G. Any temporary working roadways required shall be clean fill approved by the Engineer. In the event fill is used, the Contractor shall take every precaution to prevent the fill from mixing with native materials of the site. All such foreign fill materials shall be removed from the site following construction.

3.02 EROSION CHECKS

The Contractor shall furnish and install baled hay or straw erosion checks in all locations indicated on the Drawings, surrounding the base of all deposits of stored excavated material outside of the disturbed area, and where indicated by the Engineer. Checks, where indicated on the Drawings, shall be installed immediately after the site is cleared and before trench excavation is begun at the location indicated. Checks located surrounding stored material shall be located approximately 6 ft. from that material. Bales shall be held in place with two 2 in. by 2 in. by 3 ft. wooden stakes. Each bale shall be butted tightly against the adjoining bale to preclude short circuiting of the erosion check.

- END OF SECTION -

SECTION 02302

RAILROAD OR HIGHWAY CROSSINGS

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes railroad or highway crossings including casing pipes for pipelines installed by (jacking), (tunneling) or (boring) method, and installation of the carrier pipe within the casing in the location(s) and to the limits as shown on the Contract Drawings.

B. All work shall be performed in accordance with the applicable rules and regulations of the State and Federal Codes and with the terms and conditions of the permit issued by the railroad or highway having jurisdiction.

1.02 SUBMITTALS

A. In addition to those submittals identified in the General Provisions, the following items shall be submitted:

1. Method of Installation

   a. Following the award of the Contract, the Contractor shall submit a description of the method and equipment which is proposed to be employed in installing the casing.

   b. A Professional Engineer licensed in the State of Kentucky shall design all sheeting and bracing at the Contractor's expense. The seal of the Professional Engineer shall appear on all drawings and design sheets submitted for review.

2. Materials

   a. Drawings and manufacturer's data of the casing materials showing compliance with this specification.

3. Contractor's Data

   a. The Contractor shall submit such data as may be required as conditions of the Railroad or Highway Permit.

1.03 QUALITY ASSURANCE

A. Contractor's Qualifications

1. The casing shall be installed by a contractor who has experience in this field of construction and can furnish a record of satisfactory performance on at least three projects for work of comparable type.

PART 2 PRODUCTS

2.01 MATERIALS AND CONSTRUCTION

A. Casings

1. The casing shall be of the size and type as shown on the Contract Drawings.

   a. Steel pipe of the thickness specified shall have a minimum yield strength of 35,000 psi and a minimum ultimate strength of 60,000 psi. Steel casing pipe shall be uncoated .

   b. Liner plate of the gauge specified shall be pressed steel, galvanized and bituminous coated.

   c. Concrete pipe shall be designed for the purpose of jacking and shall be tongue and grooved.

   d. All joints in the encasement pipe shall be of continuous solid weld.

TABLE OF MINIMUM WALL THICKNESS FOR STEEL CASING PIPE

Minimum Thickness Inches	Normal Diameter Inches
0.250	4 thru 12
0.312	14 thru 18
0.375	20 thru 24
0.500	26 thru 42

B. The steel casing pipe for all highway crossings shall be as follows:

Carrier Pipe Size	Casing Pipe Size
2"	6"
3"	10"
4"	10"
6"	12"
8"	16"
10"	18"
12"	20
14"	24"
16"	26"
20"	30"
24"	34"
30"	40"

B. Carrier Pipes

1. The carrier pipe shall be as specified on the Contract Drawings and in accordance with the Section for the type of pipe.

C. Signs

1. Signs shall be weatherproof.

PART 3 EXECUTION

3.01 INSTALLATION

A. General

1. Unless otherwise shown or specified, the Contractor may employ any one of jacking, tunneling or boring methods within the limits shown for the installation of the casing.

   a. The remaining portion of the casing may be constructed by open cut method in a sheeted trench.

2. Installation of the casing pipe shall be carried out without disturbance of the embankment, pavement, tracks or other railroad or highway facilities and without obstructing the passage of traffic at any time.

3. Once the jacking, tunneling or boring operation is started, it shall proceed on a 24-hour basis without interruption until completed.

4. The casing pipe shall be maintained accurately to line and grade during the installation operation.

5. The casing shall be advanced from the lower end.

6. The use of water or other liquid, except bentonite slurry with prior approval of the Engineer, to facilitate casing placement or spoil removal is prohibited.

7. Dewatering shall be in accordance with the Section entitled "Earthwork".

B. Jacking

1. The jacking force shall be properly distributed through the jacking frame to the casing and parallel with the axis.

2. The soil shall be trimmed with care and shall not precede the jacking operation, to insure a minimum disturbance to the natural soils adjacent to the casing.

   a. No augering will be allowed.

C. Tunneling

1. Excavation shall be in such a manner that voids behind the liner plates shall be held to a minimum.

2. Poling plates shall be used as necessary to prevent caving of material above the tunnel prior to liner plate installation.

   a. Poling plates shall not be driven into the unexcavated material.

3. Liner plates shall be installed as soon as excavation proceeds the necessary distance for the next set of plates.

4. Grout plugs shall be placed on approximately 4-foot centers, at the top, bottom and on the spring line.

   a. Grout holes shall be not less than 1-inch diameter.

b. Voids between the liner plates and the excavation shall be filled with a 1:6 cement grout placed under pressure.

c. Not more than 6 lineal feet of tunnel shall progress beyond the grouting.

5. Tunneled casings shall have a foundation of Class "C" concrete placed for the entire length of the interior of the casing.

a. The leveling course shall be at such an elevation that the carrier pipe, when installed, shall be at the grade specified.

D. Boring

1. Boring shall consist of pushing the casing with an augur rotating within to remove the spoil.

2. The auger or cutting head shall not lead the casing and shall be removable from within the casing.

3. The face of the cutting head shall be arranged to provide reasonable obstruction to the free flow of soft or poor materials.

E. Pressure Carrier Pipe

1. No contact shall be permitted between the casing and the carrier pipe.

a. Casing spacers shall be used between the casing pipe and carrier pipe. Spacers shall be manufactured by Pipeline Seal & Insulator, Inc. (PSI) of Houston Texas, or equal and be of the type to separate dissimilar metals and keep the carrier pipe centered within the casing. The spacers shall be installed within the casing in the quantity and at the locations recommended by the manufacturer.

b. Both ends of the casing pipe shall be sealed with rubber boot "End Seals" by PSI or equal, held in place by stainless steel bands/clamps.

F. Non-Pressure Carrier Pipe

1. No contact shall be permitted between the casing and the carrier pipe.

a. Casing spacers shall be used between the casing pipe and carrier pipe. Spacers shall be manufactured by Pipeline Seal & Insulator, Inc. (PSI) of Houston Texas, or equal and be of the type to separate dissimilar metals and keep the carrier pipe centered within the casing. The spacers shall be installed within the casing in the quantity and at the locations recommended by the manufacturer.

e. Both ends of the casing pipe shall be sealed with rubber boot "End Seals" by PSI or equal, held in place by stainless steel bands/clamps.

-END OF SECTION-

SECTION 02502

RESTORATION OF SURFACES

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes restoration and maintenance of all types of surfaces, sidewalks, curbs, gutters, culverts and other features disturbed, damaged or destroyed during the performance of the work under or as a result of the operations of the Contract.

B. The quality of materials and the performance of work used in the restoration shall produce a surface or feature equal to the condition of each before the work began.

1.02 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards and specifications, except where more stringent requirements have been specified herein:

1. American Society for Testing and Materials (ASTM)

a. D698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600 kN-m/m^3)

1.03 SUBMITTALS

A. In addition to those submittals identified in the General Provisions, the following items shall be submitted:

1. A schedule of restoration operations. After an accepted schedule has been agreed upon it shall be adhered to unless otherwise revised with the approval of the Engineer.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 GENERAL

A. In general, permanent restoration of paved surfaces will not be permitted until one months' time has elapsed after excavations have been completely backfilled as specified. A greater length of time, but not more than nine months may be allowed to elapse before permanent restoration of street surfaces is undertaken, if additional time is required for shrinkage and settlement of the backfill.

B. The replacement of surfaces at any time, as scheduled or as directed, shall not relieve the Contractor of responsibility to repair damages by settlement or other failures.

3.02 TEMPORARY PAVEMENT

A. Immediately upon completion of refilling of the trench or excavation, the Contractor shall place a temporary pavement over all disturbed areas of streets, driveways, sidewalks, and other traveled places where the original surface has been disturbed as a result of his operations.

B. Unless otherwise specified or directed the temporary pavement shall consist of compacted run-of-crusher limestone to such a depth as required to withstand the traffic to which it will be subjected.

C. Where concrete pavements are removed, the temporary pavement shall be surfaced with "cold patch". The surface of the temporary pavement shall conform to the slope and grade of the area being restored.

D. For dust prevention, the Contractor shall treat all surfaces, not covered with cold patch, as frequently as may be required.

E. The temporary pavement shall be maintained by the Contractor in a safe and satisfactory condition until such time as the permanent paving is completed. The Contractor shall immediately remove and restore all pavement as shall become unsatisfactory.

3.03 PERMANENT PAVEMENT REPLACEMENT

A. The permanent and final repaving of all streets, driveways and similar surfaces where pavement has been removed, disturbed, settled or damaged by or as a result of performance of the Contract shall be repaired and replaced by the Contractor, by a new and similar pavement.

1. The top surface shall conform with the grade of existing adjacent pavement and the entire replacement shall meet the current specifications of the local community for the particular types of pavement.

2. Where the local community has no specification for the type of pavement, the work shall be done in conformity with the State Department of Transportation Standard which conforms the closest to the type of surfacing being replaced, as determined by the Engineer.

3.04 PREPARATION FOR PERMANENT PAVEMENT

A. When scheduled and within the time specified, the temporary pavement shall be removed and a base prepared, at the depth required by the local community or Highway Permit, to receive the permanent pavement.

1. The base shall be brought to the required grade and cross-section and thoroughly compacted before placing the permanent pavement.

2. Any base material which has become unstable for any reason shall be removed and replaced with compacted base materials.

B. Prior to placing the permanent pavement all service boxes, manhole frames and covers and similar structures within the area shall be adjusted to the established grade and cross-section.

C. The edges of existing asphalt pavement shall be cut a minimum of 1 foot beyond the excavation or disturbed base whichever is greater.

1. All cuts shall be parallel or perpendicular to the centerline of the street.

3.05 ASPHALT PAVEMENT

A. The permanent asphalt pavement replacement for streets, driveways and parking area surfaces shall be replaced with bituminous materials of the same depth and kind as the existing unless otherwise specified.

B. Prior to placing of any bituminous pavement a sealer shall be applied to the edges of the existing pavement and other features.

C. The furnishing, handling and compaction of all bituminous materials shall be in accordance with the State Department of Transportation Standards.

3.06 CONCRETE PAVEMENT AND PAVEMENT BASE

A. Concrete pavements and concrete bases for asphalt, brick or other pavement surfaces shall be replaced with Class "B" Concrete, air-entrained.

B. Paving slabs or concrete bases shall be constructed to extend 1 foot beyond each side of the trench and be supported on undisturbed soil. Where such extension of the pavement will leave less than 2 feet of original pavement slab or base, the repair of the pavement slab or base shall be extended to replace the slab to the original edge of the pavement or base unless otherwise indicated on the Contract Drawings.

C. Where the edge of the pavement slab or concrete base slab falls within the excavation, the excavation shall be backfilled with Special Backfill compacted to 95% maximum dry density as determined by ASTM D 698 up to the base of the concrete.

D. The new concrete shall be of the same thickness as the slab being replaced and shall contain reinforcement equal to the old pavement.

1. New concrete shall be placed and cured in accordance with the applicable provisions of the State Department of Transportation Standards.

3.07 STONE OR GRAVEL PAVEMENT

A. All pavement and other areas surfaced with stone or gravel shall be replaced with material to match the existing surface unless otherwise specified.

1. The depth of the stone or gravel shall be at least equal to the existing.

2. After compaction the surface shall conform to the slope and grade of the area being replaced.

3.08 CONCRETE WALKS, CURBS AND GUTTER REPLACEMENT

A. Concrete walks, curbs and gutters removed or damaged in connection with or as a result of the construction operations shall be replaced with new construction.

1. The minimum replacement will be a flag or block of sidewalk and 5 feet of curb or gutter.

B. Walks shall be constructed of Class "B" concrete, air-entrained with KY-DOT #2 stone aggregate on a 4-inch base of compacted gravel or stone.

1. The walk shall be not less than 4 inches in thickness or the thickness of the replaced walk where greater than 4 inches, shall have construction joints spaced not more than 25 feet apart, shall have expansion joints spaced not more than 50

feet apart and shall be sloped at right angles to the longitudinal centerline approximately inch per foot of width.

C. 1/2-inch expansion joint material shall be placed around all objects within the sidewalk area as well as objects to which the new concrete will abut, such as valve boxes, manhole frames, curbs, buildings and others.

D. Walks shall be hand-floated and broom-finished, edged and grooved at construction joints and at intermediate intervals matching those intervals of the walk being replaced.

1. The intermediate grooves shall be scored a minimum of 1/4 of the depth of the walk.

2. The lengths of blocks formed by the grooving tool, and distances between construction and expansion joints shall be uniform throughout the length of the walk in any one location.

E. The minimum length of curb or gutter to be left in place or replaced shall be 5 feet. Where a full section is not being replaced, the existing curb or gutter shall be saw cut to provide a true edge.

1. The restored curb or gutter shall be the same shape, thickness and finish as being replaced and shall be built of the same concrete and have construction and expansion joints as stated above for sidewalks.

F. All concrete shall be placed and cured as specified in the Section for concrete.

3.09 LAWNS AND IMPROVED AREAS

A. The area to receive topsoil shall be graded to a depth of not less than 4 inches or as specified, below the proposed finished surface.

1. If the depth of existing topsoil prior to construction was greater than 4 inches, topsoil shall be replaced to that depth.

B. The furnishing and placing of topsoil, seed and mulch shall be in accordance with the Section entitled "Topsoil and Seeding".

C. When required to obtain germination, the seeded areas shall be watered in such a manner as to prevent washing out of the seed.

D. Any washout or damage which occurs shall be regraded and reseeded until a good sod is established.

E. The Contractor shall maintain the newly seeded areas, including regrading, reseeding, watering and mowing, in good condition.

3.10 CULTIVATED AREA REPLACEMENT

A. Areas of cultivated lands shall be graded to a depth to receive topsoil of not less than the depth of the topsoil before being disturbed. All debris and inorganic material shall be removed prior to the placing of the topsoil.

B. The furnishing and placing of topsoil shall be in accordance with the Section entitled "Topsoil and Seeding".

C. After the topsoil has been placed and graded, the entire area disturbed during construction shall be cultivated to a minimum depth of 12-inches with normal farm equipment.

1. Any debris or inorganic materials appearing shall be removed.

2. The removal of stones shall be governed by the adjacent undisturbed cultivated area.

D. Grass areas shall be reseeded using a mixture equal to that of the area before being disturbed, unless otherwise specified.

3.11 OTHER TYPES OF RESTORATION

A. Trees, shrubs and landscape items damaged or destroyed as a result of the construction operations shall be replaced in like species and size.

1. All planting and care thereof shall meet the standards of the American Association of Nurserymen.

B. Water courses shall be reshaped to the original grade and cross-section and all debris removed. Where required to prevent erosion, the bottom and sides of the water course shall be protected.

C. Culverts destroyed or removed as a result of the construction operations shall be replaced in like size and material and shall be replaced at the original location and grade. When there is minor damage to a culvert and with the consent of the Engineer, a repair may be undertaken, if satisfactory results can be obtained.

D. Should brick pavements be encountered in the work, the restoration shall be as set forth in the Special Provisions or as directed.

3.12 MAINTENANCE

A. The finished products of restoration shall be maintained in an acceptable condition for and during a period of one year following the date of Substantial Completion or other such date as set forth elsewhere in the Contract Documents.

-END OF SECTION-

SECTION 02600

PIPE, FITTINGS AND INSTALLATION

PART 1 - GENERAL

1.01 SCOPE

A. Furnish all labor, materials, equipment and incidentals necessary to install and test pipe and fittings as shown on the Drawings and required by the Specifications.

B. Piping shall be located substantially as shown. The Engineer reserves the right to make such modifications in locations as may be found desirable to avoid interference between pipes or for other reasons.

C. Wherever the word pipe or piping is used it shall mean pipe and fittings unless otherwise noted. All ductile iron pipe (D.I.P.), fittings, glands and accessories shall be of the same manufacturer unless approved otherwise.

PART 2 - PRODUCTS

2.01 DUCTILE IRON PIPE (D.I.P.) AND FITTINGS

A. Ductile iron pipe (D.I.P.) shall conform to ANSI/AWWA C150/A21.50, ANSI/AWWA C151/A21.51 Standard. The pipe shall conform to thickness class 350 unless noted otherwise. All pipe, fittings and joints should be capable of accommodating pressure up to 350 psi. *SEE SECTION 01600 MATERIAL AND EQUIPMENT* for APPROVED MANUFACTURE.

B. Ductile iron mechanical joint fittings shall have a body thickness and radii of curvature conforming to ANSI A21.10 and have joints in accordance with ANSI/AWWA C111.A21.11. Fittings and joints shall be supplied with all accessories.

C. All pipe and fittings shall be tar coated outside and shall receive a standard cement lining with bituminous seal coat on the inside in accordance with ASA Specification A21.40 (AWWA-C104).

D. Cement mortar lining and seal coating for pipe and fittings, where applicable, shall be in accordance with ANSI/AWWA C104/A21.4. Bituminous outside coating shall be in accordance with ANSI/AWWA C151/A21.51 for pipe and ANSI/AWWA C110/A21.10 for fittings.

E. All ductile fittings shall be rated at 350 psi water working pressure plus water hammer. Ductile iron fittings shall be ductile cast-iron grade 80-60-03 per ASTM Specification A339-55.

F. No separate pay item has been established for fittings and no determination of the number of fittings required on the job has been made. The Contractor, during the bidding phase, shall determine the number of fittings required on the job and include the cost of the fittings and installation in the unit price for pipe.

G. Push-on type joints shall be single rubber gasket, with cast gasket socket and recessed bell with a tapered annular opening and flared socket and shall conform to ANSI/AWWA C111/A21.11. Plain spigot ends shall be suitably beveled to permit easy entry into the bell, centering and compressing the gasket.

H. Ductile iron flanged joint pipe shall conform to ANSI/AWWA C115/A 21.15 Standard and have a Class of 350. The pipe shall have a rated working pressure of 350 psi with Class 125 flanges. Gaskets shall be ring gaskets with a thickness of 1/8-inch. Flange bolts shall conform to ANSI B16.1.

I. Flanged fittings shall meet all requirements of ANSI/AWWA C110/A21.10 and have Class 125 flanges. Fittings shall accommodate a working pressure up to 350 psi and be supplied with all accessories.

2.02 POLYVINYL CHLORIDE (PVC) PIPE (SDR 21 AND SDR 17)

A. Polyvinyl chloride (PVC) pipe for water mains shall be Class 200 (SDR 21) or Class 250 (SDR 17) PVC pressure rated pipe as shown on the Drawings or indicated in the proposal form with either twin gasket joints or integral bell joints with rubber O-ring seals.

B. All PVC pipe shall conform to the latest revisions of ASTM D-1784 (PVC Compounds), ASTM D-2241 (PVC Plastic Pipe, SDR) and ASTM D-2672 (Bell-End PVC Pipe). Rubber gasketed joints shall conform to ASTM D-3139. The gaskets for the PVC pipe joint shall conform to ASTM F-477 and D-1869.

C. Couplings shall be furnished by the pipe manufacturer and shall accommodate the pipe for which they are used. Rubber gasket joints shall provide adequate expansion to allow for a 50 degree change in temperature on one length of pipe. Lubrication for rubber connected couplings shall be water soluble, non-toxic, be non-objectionable in taste and odor and have no deteriorating affect on the PVC or rubber gaskets and shall be as supplied by the pipe manufacturer. Couplings shall conform to ASTM D-3139; SDR-21, 200 psi.

D. All pipe and couplings shall bear identification markings that will remain legible during normal handling, storage and installation, which have been applied in a manner that will not reduce the strength of the pipe or coupling or otherwise damage them. Pipe and coupling markings shall include the normal size and OD base, material code designation, dimension ratio number, ASTM Pressure Class, ASTM designation number for this standard, manufacturer's name or trademark, seal (mark) of the testing agency that verified the suitability of the pipe material for potable-water service. Each marking shall be applied at intervals of not more than 5 feet for the pipe and shall be marked on each coupling.

2.03 POLYVINYL CHLORINE (PVC) PIPE - C.I. PIPE SIZE DR14 AND DR 18

A. Pipe shall meet the requirements of AWWA C-900 Polyvinyl Chlorine (PVC) Pressure Pipe. All Class 200 pipe shall meet the requirements of DR 14 and all Class 150 pipe shall meet the requirements of DR 18. Joints shall be integral bell or twin gasket joints with rubber O-ring seals.

B. All pipe shall be suitable for use as a pressure conduit. Provisions must be made for expansion and contractions at each joint with an elastomeric ring. The bell shall consist of an integral wall section with a solid cross-section elastomeric ring which meets the requirements of ASTM D-1869 and F-477. The bell section shall be designed to be at least as strong as the pipe wall. Sizes and dimensions shall be as shown in this specification.

C. Gaskets and lubricants intended for use with PVC pipe and couplings shall be made from materials that are compatible with the plastic material and with each other when used together, will not support the growth of bacteria, and will not adversely affect the potable qualities of the water that is to be transported. Gaskets and lubricants shall be supplied by the pipe manufacturer.

D. Physical Requirements:

1. Standard Laying Lengths - Standard laying lengths shall be 20 ft. (plus or minus 1") for all sizes. The total footage of pipe of any class and size shall be furnished in standard lengths. Each length of pipe shall be tested to four times the class pressure of the pipe for minimum of 5 second. The integral bell shall be tested with the pipe.

2. Pipe Stiffness - The pipe stiffness using F/y for PVC class water pipe shall be as follows:

Class	DR	F/y
200	14	815
150	18	364

3. Quick Burst Test - Randomly selected tested in accordance with ASTM D-1599 shall withstand without failure pressures listed below when applied in 60 - 70 seconds. Class 150 shall have a minimum burst pressure of 755 psi and Class 200 shall have a minimum burst pressure of 986 psi at 73 degrees F. for all sizes.

4. Drop Impact Test - Pipe shall withstand without failure at 73 degrees F. an impact of 120 ft/lbs created by a falling 12 lb missile with a 2" radius nose without visible evidence of shattering or splitting.

E. All pipe and couplings shall bear identification markings that will remain legible during normal handling, storage and installation, which have been applied in a manner that will not reduce the strength of the pipe or coupling or otherwise damage them. Pipe and coupling markings shall include the nominal size and OD base, material code designation, dimension ratio number, AWWA Pressure Class, AWWA designation number for this standard, manufacturer's name or trademark, seal (mark) of the testing agency that verified the suitability of the pipe material for potable-water service. Each marking shall be applied at intervals of not more than 5 feet for the pipe and shall be marked on each coupling.

2.04 DUCTILE IRON MECHANICAL JOINT FITTINGS FOR PVC PIPE

A. General: Cast-iron mechanical joints shall conform to the latest revision of ANSI A21.11 for centrifugally cast-iron water pipe.

1. 3" to 12". All Working Pressures: Fittings shall conform to ASA Specification A21.10 for 250 psi water working pressure plus water hammer.

2. Fittings 12" and Over, for 150 psi and Less WWP: Fittings for use on 150 psi WWP pipe shall be AWWA Class D Pattern.

3. Fittings 12" and Larger, for 200 psi and Above WWP: Fittings shall be ductile iron or gray iron rated at 250 psi water working pressure plus water hammer. Ductile iron fittings only will be used with ductile iron pipe.

B. All ductile iron fittings shall be rated at 250 psi water working pressure plus water hammer. Ductile iron fittings shall be ductile cast-iron grad 80-60-03 per ASTM Specification A33955. All fittings for connection to PVC pipe-all classes, shall be ductile iron.

C. No separate pay item has been established for fittings and no determination of the number of fittings required on the job has been made. The Contractor, during the bidding phase, shall determine the number of fittings required on the job and include the cost of the fittings and installation in the unit price for pipe.

D. Lining and Coating: All mechanical joint fittings shall be cement lined and bituminous seal coated per Federal Specification WW-P-42lb and ASA Specification A421.40 (AWWA C104). Bituminous outside coating shall be in accordance with ANSI/AWWA C110/A21.10.

PART 3 - EXECUTION

3.01 LAYING DEPTHS FOR WATER MAINS

In general, water mains shall be laid with a minimum cover of 36" above the top of the main, unless otherwise noted on the Drawings , i.e. for minimum separation between water main and other utilities, connections to existing mains, valve locations, or when required by Kentucky Department of Highways, i.e. ditch lines and borings shall be 42" minimum cover.

3.02 PIPE BEDDING

A. The foundation for pipes laid in trenches shall be prepared so that the entire load of the backfill on top of the pipe will be carried uniformly on the barrel of the pipe. Pipe bells shall not carry any of the load of the backfill.

B. The Contractor shall use the "Undercutting Method" of pipe bedding.

C. When the "Undercutting Method" is used in rock bottom trenches, Class I granular bedding (No.9 crushed stone aggregate) or earth shall be of such depth that the bottom of the barrel of the pipe will be at least 6" above the bottom of the trench as excavated. Pipe bedding required in this paragraph is NOT considered a separate pay item.

D. In wet, yielding and mucky locations where pipe is in danger of sinking below grade or floating out of line or grade, the pipe must be weighted or secured permanently in place by such means as will prove effective. In areas where a high water table exists, the Contractor is cautioned to exercise extreme care in the placement of the backfill material to prevent flotation of the pipe at any time.

E. Where an unstable (i.e., water, mud, etc.) trench bottom is encountered, stabilization of the trench bottom is required. This is to be accomplished by undercutting the trench depth and replacing to grade with a foundation of crushed stone aggregate. The depth of the foundations dependent upon the severity of the trench bottom. The size of stone aggregate used in the foundation will be determined by the condition of the unstable material. Once the trench bottom has been stabilized, the required Class I bedding can be placed. The amount of crushed stone aggregate required to bring the top of the foundation to the trench bottom prior to the removal of the unstable material will be considered a separate pay item following negotiation between the Contractor and Owner and constitute a change order item. No compensation will be made if the instability of the trench bottom is caused by the Contractor's neglect.

F. The Contractor shall use compacted earth material or Class I granular bedding (No.9 crushed stone aggregate) when the pipe is to be placed in the rock bottom trenches or in trenches with excavated rock present. This type of bedding material shall be placed 12" above and 6" below the pipe as shown on the Contract Drawings as "Class C Bedding Detail".

G. It should be noted that no pipe shall be laid on solid or blasted rock. No rock shall be allowed to rest against the pipe once it is placed in the trench.

H. Pipe bedding as required in Paragraphs C and D of this Article is NOT considered a separate pay item.

3.03 PIPE LAYING

A. All pipe shall be laid with ends abutting and true to the lines and grades indicated on the Plans. Pipe shall be fitted and matched so that when laid in the work, it will provide a smooth and uniform invert. Supporting of pipe shall be as set out hereinbefore under "Pipe Bedding" and in no case shall the supporting of pipe on blocks be permitted.

B. Fittings and specials for the water main shall be provided and laid as and where directed by the Engineer or as shown on the Plans.

C. Before each piece of pipe is lowered into the trench, it shall be thoroughly swabbed out to insure its being clean. Any piece of pipe or fitting which is known to be defective shall not be laid or placed in the lines. If any defective pipe or fitting shall be discovered after the pipe is laid, it shall be removed and replaced with a satisfactory pipe or fitting without additional charge. In case a length of pipe is cut to fit in a line, it shall be so cut as to leave a smooth end at right angles tot he longitudinal axis of the pipe.

D. The interior of the pipe, as the work progresses, shall be cleaned of dirt, jointing materials, and superfluous materials of every description. When laying of pipe is topped for any reason, the exposed end of such pipe shall be closed with a plywood plug fitted into the pipe bell so as to exclude earth or other material and precautions shall be taken to prevent flotation of pipe by runoff into trench.

E. No backfilling (except for securing pipe in place) over pipe will be allowed until the Engineer has had an opportunity to make an inspection of the joints, alignment and grade in the section laid, but such inspection shall not relieve the Contractor of further liability in case of defective joints, misalignment caused by backfilling and other such deficiencies that are noted later.

F. Anchorage of Bends, Tees, Plugs and Valves:

1. At all tees, plugs, caps and bends of 11-1/4 degrees and over, and at reducers or in fittings where changes in pipe diameter occur, movement shall be prevented by using suitable harness, thrust blocks or ballast. Valves shall be provided with similar protection. Thrust blocks and supports shall be as shown in the typical details, with sufficient volumes of concrete being provided; however, care shall be taken to leave weep holes unobstructed and allow for future tightening of all nearby joints. Unless otherwise directed by the Engineer, thrust blocks shall be placed so that the pipe and fitting joints will be accessible for repair. Thrust blocks shall bear on undisturbed earth or rock.

2. Bridles, harness or pipe ballasting shall meet with the approval of the Engineer. Steel rods and clamps shall be galvanized.

3. No extra pay shall be allowed for work on proper anchorage of pipe, fittings or other appurtenances; such items shall be included in the unit price bid for the supported item.

3.04 WATER MAINS PUSHED UNDER DRIVEWAYS

The Contractor may be required to tunnel or bore under a bituminous or concrete surface driveway instead of open trenching as requested by the property owner. The opening under the driveway shall be of the smallest diameter possible to accommodate the water main to minimize settlement of the driveway. Should settlement occur, the Contractor shall repair the driveway at his own expense in a manner satisfactory to the Engineer and the property owner.

3.05 JOINTING

Jointing shall be accomplished in accordance with the manufacturer's recommendation.

3.06 TYPES OF CRUSHED STONE MATERIAL

Two classes of crushed stone material are mentioned in the Detailed Specifications. The Type of material used in each class is as follows:

Class I No. 9 Aggregate
Class II Dense Graded Aggregate

3.07 BACKFILLING

A. Initial Backfill:

1. This backfill is defined as that material which is placed over the water main from the spring line in an earth trench to a point 6" above the top of the pipe or from the trench bottom in a rock trench to a point 12" above the top of the pipe. The initial backfill for Case I situations shall be earth material free of rocks, acceptable to the Engineer or Class I material (No. 9 crushed stone aggregate). The initial backfill for Case II, Case III and Case IV situations shall be compacted earth material or be Class I material (No.9 crushed stone aggregate).

2. In areas where large quantities of rock are excavated, and the excavated earth is insufficient, then the Contractor must either haul in earth or order crushed stone aggregate for backfilling over the top of the pipe. Neither earth nor the crushed stone aggregate used to fulfill the backfill requirements is considered a pay item.

B. Final Backfill: There are four cases where the method final backfilling varies. The various cases and their trench situations are as follows:

1. Case I: Areas not subject to vehicular traffic.

2. Case II: Gravel areas subject to light vehicular traffic such as residential driveways; church and commercial parking lots and entrances; and farm drives.

3. Case III: City and County gravel roads; gravel and bituminous road shoulders; all bituminous surface areas such as City and County streets, residential driveways, church and commercial parking lots, and entrances; City and County road shoulders.

4. Case IV: State maintained streets and roads; road shoulders for State roads and streets.

C. In all cases, walking or working on the completed pipelines, except as may be necessary in backfilling, will not be permitted until the trench has been backfilled to a point twelve (12) inches above the top of the pipe. The method of final backfilling for each of the above cases is as follows:

1. Case I - The trench shall be backfilled from a point 6" (12" for a rock trench) above the top of the pipe to a point 8" below the surface of the ground with earth material free from large rock (over one-half cubic foot in volume), acceptable to the Engineer. The remainder of the trench to existing grade shall be backfilled with earth material reasonably free of any rocks.

   Earth backfill used in this Case is not a separate pay item but will be paid under the pay item "Water Main".

2. Case II - The trench shall be backfilled from a point 6" (12" for a rock trench) above the top of the pipe to a point 12" below the surface of the ground with Class I (No. 9 crushed stone aggregate) material. The trench shall be tamped to assure maximum possible compaction

(approximately 80 to 85 percent of Standard Proctor density). Extreme care shall be exercised to prevent damage to the pipe during tamping operation. The remainder of the trench to existing grade shall be backfilled with Class II (dense graded aggregate) material with the material being mounded over the trench. The trench shall be tamped again to assure additional compaction. The trench may be left with a slight mound if permitted by the Engineer.

Class I material used and method of backfilling used in this case is not a separate pay item and is considered incidental to the work and will be paid for under the item "Water Main".

Class II material used in this method of backfill is not a separate pay item and will be included in the unit price per linear foot under the item "Water Main".

Sufficient stockpiles of Class II material shall be placed throughout the project area to insure immediate replacement by the Contractor of any settled areas. No extra payment will be made for the filling of settled areas by the Contractor.

3. Case III - The trench shall be backfilled from a point 6" (12" for a rock trench) above the top of pipe to the height indicated in the "City and County Maintained Streets, Roads and Driveway Pavement Replacement" detail with Class I (No. 9 crushed stone aggregate) material. Said material shall be tamped as described for Case II. A 12-inch layer of Class II (dense graded aggregate) material shall be placed over the compacted backfill before bituminous or concrete surface is placed as shown in the previously mentioned details. The 12-inch layer of Class II material is NOT a separate pay item but such expense will be borne by the Contractor and is considered incidental to the bid items "Bituminous Surface Replacement" and "Concrete Surface Replacement". Also considered incidental is all temporary stone required for a temporary surface between backfilling and pavement replacement.

   Sufficient stockpiles of Class II material shall be placed throughout the project area to insure immediate replacement by the Contractor of any settled areas. No extra payment will be made for the filling in of settled areas by the Contractor. Class II material used in this method of backfill is paid for as a support item under item "Bituminous Surface Replacement" or "Concrete Surface Replacement" as its unit price per linear foot.

   Class I material used for backfilling is not a separate pay item and is considered incidental to the bid item "Water Main".

4. Case IV - The trench shall be backfilled from the spring line to a point one 12-inches above the top of the pipe with earth material free from rock and acceptable to the Engineer, it shall be carefully and solidly tamped by approved mechanical methods. The remainder of the trench shall be backfilled to the height indicated in the "State Maintained Streets and Roads Pavement Replacement Detail" in the Contract Drawings, with material free from rock and acceptable tot he Engineer; said material shall be mechanically tamped in approximately six-inch layers to obtain the maximum possible compaction. The backfilling method is NOT a separate pay item. A 12-inch layer of dense graded aggregate shall be placed over the compacted earth backfill when a bituminous or concrete surface street or road has been trenched. The 12-inch layer of stone is not a separate pay item but such expense will be borne by the Contractor.

D. Excavated materials from trenches and tunnels, in excess of quantity required for trench backfill, shall be disposed of by the Contractor. The Contractor may contact the Owner regarding the location of a suitable disposal site; however, if the Owner cannot recommend a site, it shall be the responsibility of the Contractor to obtain locations

or permits for the disposal of the waste material. Unit prices for the various pipe sizes shall include the cost of disposing of excess excavated materials, as set forth herein, no additional compensation being allowed for hauling or overhaul.

3.08 CRUSHED STONE BACKFILL

A. The Class I granular material used in Case II and Case III backfill situations shall be No. 9 Crushed Stone aggregate (No.9 Stone). Granular material will not be paid for as a separate bid item.

B. The twelve inches 12-inch of crushed stone backfill that is required in "City and County Maintained Streets, Roads and Driveway Pavement Replacement" or "State Maintained Streets and Roads Pavement Replacement" will not be paid for under the provisions of this article.

3.09 BITUMINOUS PAVEMENT REPLACEMENT

A. Sections of pavement shall be replaced as required to install the pipelines under the work of this Section. Disturbed pavement shall be reconstructed to original lines and grades with bituminous binder as detailed on the Drawings and in such manner as to leave all such surfaces in fully as good or better condition than that which existed prior to these operations.

B. Prior to trenching, the pavement shall be scored or cut to straight edges along each side of the proposed trench to avoid unnecessary damage to the remainder of the paving. Edges of the existing pavement shall be recut and trimmed as necessary to square, straight edges after the pipe has been installed and prior to placement of the binder course.

C. Backfilling of trenches shall be in accordance with the applicable portions of this section.

D. Bituminous concrete binder shall be one course construction in accordance with applicable provisions of the Kentucky Department of Highways Standard Specifications, Section 402. Placement and compaction of binder course shall be in accordance with Section 402 of the Kentucky Department of Highways Standard Specifications. Minimum thickness after compaction shall be as shown on the Drawings.

E. Bituminous pavement replacement will not be paid for as a separate bid item.

3.10 CRUSHED STONE SURFACE REPLACEMENT

The Class II granular material used in Case II backfill situations shall be dense graded aggregate (D.G.A.). Granular material will be included in the unit price per linear foot for "Water Mains".

3.11 CONCRETE SEPARATOR FOR UTILITY CROSSING OR CASING PIPE WATER/SAN. SEWER CROSSING

A. At locations shown on the Contract Drawings, or as required by the Specifications and Contract Drawings, concrete separator shall be used when the clearance between the proposed water main and any existing non-contaminating utility pipe is one (1) foot or less. Utility pipe includes underground gas, telephone and electrical conduit, storm sewers, or any other underground utility pipe.

B. There are two cases of non-contaminating utility crossing encasement. Case I is applicable when the proposed water main is <u>below</u> the existing utility line. Case II is applicable when the proposed water main is laid <u>above</u> the utility line. In either case, the concrete shall extend to at least the spring line of each pipe involved.

C. When a water main crosses an existing sanitary sewer line, either above or below and less than two feet vertical or ten feet horizontal separation, the water main shall be encased as shown on the Standard Details, or as required by the Specifications and Contract Documents.

D. Concrete shall be Class B (2500 psi) and shall be mixed sufficiently wet to permit it to flow between the pipes to form a continuous bridge. In tamping the concrete, care shall be taken not to disturb the grade of line of either pipe or damage the joints.

3.12 CONCRETE FOR CREEK CROSSING (Type B and C Creek Crossing)

A. At locations shown on the Contract Drawings, or as required by the Specifications and Contract Drawings, concrete encasement shall be used when the water main crosses a stream or creek which is in rock or as directed by the Engineer.

B. All creek crossings (Types B and C) shall be constructed as per the detail shown on the Contract Drawings.

C. Concrete shall be Class B (3000 psi) and shall be mixed sufficiently wet to permit flow around the pipe and to form a continuous bed. In tamping the concrete, care shall be taken not to disturb the grade or line of the pipe or injure the joints. Concrete shall be protected from excess water.

D. Concrete placed outside the specified limits or without authorization from the Engineer will not be subject to payment. Concrete will be paid under the pay items "Crossing Type B and Creek Crossing Type C.

3.13 TESTING OF WATER MAINS

The completed work shall comply with the provisions listed below, or similar requirements which will insure equal or better results:

A. Before any allowable leakage calculation are preformed the pipeline being tested must pass the hydrostatically test.

B. The pipe shall be hydrostatically tested at 1.5 times the design pressure at the point of testing. The duration of the test(s) shall be at least 2 hours during which time the pressure shall not fall more than 5 psi. The pipe shall be tested for allowable leakage according to AWWA C-600 (latest revision) concurrently with the pressure test.

C. Where practicable, pipelines shall be tested between line valves or plugs in lengths of not more than 3000 feet. Testing shall proceed from the source of water toward the termination of the line. The line shall be tested upon the completion of the first 3000 feet. After the completion of two consecutive tests without failure, the Contractor, at his option and with the Engineer's approval, may discontinue testing until the system is complete.

D. Duration of test shall be not less than 2 hours.

E. Lines which fail to meet tests shall be repaired and retested as necessary until test requirements are complied with.

F. All pipe, fittings and other materials found to be defective under test shall be removed and replaced at the Contractor's expense.

G. Test pressures shall not be less than 1.5 times the working pressure at the highest point along the test section, not exceed pipe or thrust restraint design pressure, not vary more than $\pm$ 5 psi and not exceed twice the rated pressure of the valves when the pressure boundary of the test sections include closed gate valves.

H. Before applying the specified test pressure, air shall be expelled completely from the pipes and valves. If permanent air vents are not located at high points within the test section, the Contractor shall install corporation cocks at such points so that the air can be expelled as the line is filled with water.

3.14 LEAKAGE TEST

A. The leakage shall be defined as the quantity of water that must be supplied to the tested section to maintain pressure within 5 psi of the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water.

B. The allowable leakage shall not be greater than that determined by the following formula:

$$L = \frac{SD(P)^{1/2}}{133,200}$$

Where L is the allowable leakage in gallons per hour; S is the length of the pipeline tested; D is the nominal diameter of the pipe, in inches; and P is the average test pressure during the leakage test, in pounds per square inch gage.

C. All visible leaks are to be repaired regardless of the amount of leakage.

3.15 DISINFECTION OF WATER LINES

A. New potable water lines shall not be placed into service, either temporarily or permanently, until they have been thoroughly disinfected in accordance with the following requirements and to the satisfaction of the OWNER.

B. After pressure testing, a solution of hypochlorite using HTH or equal shall be introduced into the section of the line being disinfected sufficient to insure a chlorine dosage of at least 50 parts per million (PPM) in the water main. While the solution is being applied, the water should be allowed to escape at the ends of the line until tests indicate that a chlorine concentration of at least 50 PPM has been obtained throughout the pipe. Open and close all valves and cocks while chlorinating agent is in the piping system. The chlorinated water shall remain in the pipe for 24 hours. Disinfection shall be repeated until a minimum chlorine residual of 25 PPM is measured after 24 hours. Once a chlorine residual of 25 PPM is obtained after 24 hours, the water main shall be thoroughly flushed until the residual chlorine content is not greater than 1.0 PPM.

C. Following disinfection of the line, bacteriological samples shall be collected and analyzed in accordance with the requirements of Kentucky Department of Natural Resources and Environmental Protection. When the samples have been tested and reported safe from contamination, the water line may be connected to the system. The Contractor shall provide to OWNER written documentation that the water sample passed the bacteriological test and is safe.

D. All sampling shall be taken in the presence of the Engineer or his representative.

E. The contractor shall compensate the SHWD for all water used in flushing, testing and sterilization. This compensation shall be at $5.00 per thousand gallons.

3.16 PLACEMENT OF TRACING WIRE

Detectable underground copper tracing wire shall be installed with all utility lines. Insulated copper trace wire shall be attached to the top of the pipe with adhesive tape or other suitable devices. At each hydrant, valve, and end of new pipe installation, the trace wire shall be daylighted and the ends connected together with split bolt connectors covered with waterproof tape or wrap. For long runs of pipe, the maximum unbroken length of the trace wire shall be 2500 feet. Underground splicing shall be made using brass split bolt electrical connectors. The trace wire shall be #12 AWG THWN copper.

3.17 PLACEMENT OF IDENTIFICATION TAPE (not in this contract)

A. The placement of detectable underground marking tape shall be installed over all utility lines. Care shall be taken to insure that the buried marking tape is not broken when installed. *SEE SECTION 01600 MATERIAL AND EQUIPMENT* for APPROVED MANUFACTURE.

B. The identification tape shall bear the printed identification of the utility line below it, such as "CAUTION - BURIED WATER LINE BELOW". Tape shall be reverse printed, surface printing will not be acceptable. The tape shall be visible in all types and colors of soil and provide maximum color contrast to the soil. The tape shall meet the APWA color code, and shall be two (2) inches in width. Colors are: yellow - gas, green - sewer, red - electric, blue - water, orange - telephone, brown - force main.

C. The tape shall be the last equipment installed in the ditch so as to be first out. The tape shall be buried 4 - 6 inches below top of grade. After trench backfilling, the tape shall be placed in the backfill and allowed to settle into place with the backfill. The tape may be plowed in after final settlement, installed with a tool during the trench backfilling process, unrolled before final restoration or installed in any other way acceptable to the Owner or his agent or Engineer.

3.18 CLEAN-UP

Upon completion of the installation of the piping and appurtenances, the Contractor shall remove all debris and surplus construction materials resulting from the work. The Contractor shall grade the ground along each side of pipe trenches in a uniform and neat manner leaving the construction area in a shape as near as possible to the original ground line.

3.19 CONNECTING TO THE WATER SYSTEM

Unless otherwise directed by the OWNER, the CONTRACTOR shall connect the new water main to the existing water system. The CONTRACTOR shall notify the OWNER when the connection is to be made so that representatives of the OWNER may operate existing valves and witness the connection. A minimum notice of at least 24 hours in advance of the connection shall be given to the UTILITY. The Contractor shall coordinate all connections and other work which require disruption of water service so as to minimize the amount of time the affected water lines are out of service.

- END OF SECTION -

SECTION 02626

CUSTOMER METER SERVICE AND SERVICE TUBING

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes service pipelines constructed of CTS polyethelene tubing as shown on the Contract Drawings, complete with fittings and accessories.

B. Certain features of the CTS tubing shall be as scheduled.

C. The Contractor shall furnish all labor, tools, equipment, and materials necessary to complete the meter service connections as shown on the Contract Drawings and herein specified.

1.02 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards and specifications, except where more stringent requirements have been specified herein:

1. American Society for Testing and Materials (ASTM)
2. American Water Works Association (AWWA)

1.03 SUBMITTALS

A. In addition to those submittals identified in the General Provisions, the following items shall be submitted:

1. Manufacturer's certification that all materials furnished are in compliance with the applicable requirements of the referenced standards and this specification.

2. .Layout drawings showing the location of copper tube including details of the support system, sleeves, unions and appurtenances.

PART 2 PRODUCTS

2.01 SERVICE CLAMPS

All service connections of all sizes shall be made through the use of service clamps or saddles. Service saddles shall have ductile iron body, double strapped with O-ring resilient gasket, suitable for use on ductile iron pipe or PVC pipe, and tapped with same threads as the corporation stops. Saddles for all mains shall be double strap type saddles and have a maximum working pressure of 350 psi *SEE SECTION 01600 MATERIAL AND EQUIPMENT* for APPROVED MANUFACTURE.

2.02 CORPORATION STOPS

Corporation stops for use in service clamps shall be equal for 3/4", 1" and 2" service tubing and have a maximum working pressure of 300 psi. Corporation stops shall have iron pipe threads with compression coupling connection for copper tubing outlets. A rigid stainless steel insert stiffener shall be used inside the PE tubing, when encountered. *SEE SECTION 01600 MATERIAL AND EQUIPMENT* for APPROVED MANUFACTURE.

2.03 SERVICE TUBING 3/4", 1" AND 2" POLYETHYLENE TUBING (CTS SERVICE TUBING)

A. Pipe shall be made from virgin, ultra-high molecular weight polyethylene resin meeting the requirements of Type III, Class C, Category P34 polyethylene as defined by ASTM D-1248, latest revision, "Polyethylene Plastics Molding and Extrusion Materials".

B. Dimensions and tolerances shall meet the values as listed in AWWA C-901, latest revision, "Polyethylene (PE) Pressure Pipe Tubing and Fittings". Standard dimension ratio shall be DR-7.3 (OD base), Pressure Class 200 psi.

C. Pipe shall be rated for use with water at 73.4 degrees F. at a hydrostatic design stress of 630 psi and a maximum working pressure of 200 psi. The pipe shall sustain a water pressure as defined in ASTM D 1598 for 1000 hours with water at 73.4 degrees F.

D. Surface shall be homogeneous inside and out and completely free of irregularity. Random testing shall be performed at intervals during all production runs to assure uniformity in all respects. The tubing shall carry the National Sanitation Foundation seal of approval for drinking water.

E. Pipe shall be marked in lettering at intervals of not more than five (5) feet and such marking shall include nominal size; manufacturer's name or trademark; pressure rating for water at 73.4 degrees F., 200 psi; applicable ASTM specification,; ASTM material specification, PE 3406; standard dimension ratio, DR-7.3; the National Sanitation Foundation Seal of Approval (NSF mark) and production code.

F. Pipe shall be guaranteed in writing against rot, corrosion and defects for 50 years from date of installation, with pipe replacement and labor cost warranted in writing for 25 years from date of installation.

2.04 COPPER SERVICE TUBING (not in this contract)

A. Buried, Exterior - Copper Pipe: Type K hard drawn copper per ASTM B-88. Fittings: Wrought copper or cast brass. Joints: Lead free, tin-silver solder.

B. Buried, Below Slab: Copper Pipe, 2" and Smaller: Type K soft drawn copper per ASTM B-88. Fittings and joints shall not be permitted below slab.

C. Buried: Copper Pipe, 2" and Smaller: Type K soft drawn copper per ASTM B-88. Fittings and joints shall not be permitted in the service tubing.

D. All solder joints shall be soldered with an approved, lead free tin-silver solder. Acid core solder shall not be used.

E. Copper tube shall be as specified herein unless otherwise shown on the Contract Drawings or in the pipe schedule.

F. Copper tube shall conform to the following standards:

	ASTM
Seamless Copper Water Tube	B88
Copper Drainage Tube (DWV)	B306
Seamless Copper Tube, Bright Annealed	B68

1. Seamless copper water tube shall be used for hot and cold water and compressed air.

   a. Type K where installed in concrete, underground or when immersed in liquids.

b. Type L where exposed and in concealed locations inside structures.

c. Soft temper when installed in concrete or underground.

d. Hard temper when installed in exposed and concealed locations.

2. Copper drainage tube will be permitted only for sanitary waste, drain and vent piping above ground and inside structures.

3. Bright annealed seamless copper tube shall be used for liquid fuel and refrigerant and all small (3/8 inch and smaller) tubing unless otherwise specified.

G. Wall thickness shall be at least equal to Type K seamless copper water tube unless heavier walls are specified.

2.05 METER SETTING EQUIPMENT

A. Meters shall be placed inside meter boxes using coppersetters with 3/4" or 1" saddle nut connection for the meter. *SEE SECTION 01600 MATERIAL AND EQUIPMENT* for APPROVED MANUFACTURE. All tandemsetters shall have a ball angle meter valve (lockable) stop at the meter inlet and dual check valve on the outlet. tandemsetters shall be 12 inches in height with connections for the appropriate service tubing and have a maximum working pressure of 300 psi. **Resetters shall be Mueller or approved equal and shall be used with an 3/4" IPRV. The resetter is used so as to avoid having to dig out the existing corp stop when adding IPRV's to existing setters. The existing Radio Read meter shall be reinstalled into the resetters or where new the existing meter setting is replaced. The contractor shall provide Sensus SRII Radio Read meters for new meter settings.**

B. For larger meters (1-1/2" and 2") the meters shall be installed with ball meter valves on inlet side and the meter outlet side. Meters shall be placed on concrete block or equivalent support inside the meter box.

C. For individual meter with pressure reducing valves or more than one meter the coppersetters shall be the Tandem type coppersetters as manufactured by Ford, Mueller or Engineer approved equal and 12 inches in height and placed in meter boxes with 18" I.D.

E. A rigid stainless steel insert stiffener shall be used inside the PE tubing at all connections to the coppersetters.

2.06 SERVICE METERS

The service meter main body shall be of high grade bronze, with hinges, single lid cover and raised characters cast on the body indicating the direction of flow. Meter shall have a working pressure rating of 150 psi. The register shall be straight reading gallon type. The register unit shall be hermetically sealed, and driven by permanent magnets. The register shall have a center sweep hand and a test circle shall be divided into 100 equal parts and include a flow finder. The register shall carry a minimum 10-year warranty.

The meters shall be **Sensus SRII Radio Read Meters**. The entire unit is to be pre-assembled in a workmanlike manner with all components fitted snugly into the box and fastened to prevent movement. All joints shall be sealed with Teflon tape. The inlet and outlet is to be equipped with compression couplings.

2.08 METER BOXES

Meter boxes shall be plastic or "Ultra-Rib" circular with dimension as shown on the Drawings. The meter box cover where installation is to be in roadways or sidewalks and shall have heavy duty lid for light vehicular traffic. The meter box where installation is to be roadways or sidewalks shall be of concrete construction for vehicular traffic. The meter box, cover and meter setting shall be constructed as shown on the drawings or as directed by the Owner or Engineer. *SEE SECTION 01600 MATERIAL AND EQUIPMENT* for APPROVED MANUFACTURE.

2.08 ACCESSORIES

A. Fittings and Couplings

1. Fittings for copper tube shall be wrought copper or cast bronze for soldered joints and brass for flared joints.

2. Flexible couplings as shown or required for copper tube shall be flexible metal hose couplings.

B. Joints

1. Joints for seamless copper water tube to be installed in concrete and underground shall be flared type and shall have threads in accordance with AWWA C 800.

2. Joints for seamless copper water tube and copper drainage tube installed exposed and inside structures shall be soldered.

   a. Solder and flux used in joints of water lines, shall contain no more than 0.2% lead.

   b. Solder shall be Tin-Silver or approved equal.

   c. Solder flux shall be as recommended by the solder manufacturer.

3. Joints for bright annealed seamless copper tube used in liquid fuel lines shall have flared joints, approved by Underwriter's Laboratories.

4. Joints for small tubing (3/8 inch and smaller) shall be of the locking type compression fittings or soldered as shown in the piping schedule and as directed.

PART 3 - EXECUTION

3.01 INSTALLATION OF METER SERVICES

All customer meter services shall be installed as shown on the Contract Drawings and shall be set near the property owner's property line and outside of the highway right-of-way. The Owner reserves the right to change the location of the meter services prior to installation for ease of daily operation of the system and reading the individual meters. Existing customer services must be connected on customer side of meter.

3.02 INSTALLATION OF SERVICE TUBING

A. All service tubing installed beneath bituminous or concrete roads shall be jacked under the roads. When State maintained roads are being jacked and rock is encountered, permission to open cut the road shall be obtained by the Contractor from the Department of Transportation's District Permit Engineer. If permission is refused, the Contractor shall attempt to jack at another location and shall continue to do so until a successful crossing is obtained.

B. Minimum cover for all service lines shall be 36 inches (at all locations) when within the proposed and existing highway right-of-way and construction easements. Additional cover may be required at proposed drainage ditch, storm sewer, or other noted locations.

3.03 BACKFILLING SERVICE TUBING

When service tubing is laid in an open cut across a road of any type surface (crushed stone, bituminous or concrete), the backfill shall consist of Class II granular material (dense graded aggregate) and shall be placed full depth. Payment for Class II material used will not be paid as a separate pay item, but will be included in the price for installing the service tubing.

3.04 INSTALLATION OF COPPER TUBING (not in contract)

A. Install copper tubing, fittings, specials, and accessories in accordance with the applicable configuration shown on the Contract Drawings and the provisions of the Sections entitled "Trenching, Backfilling and Compacting" and "Pipeline Installation".

B. Exposed copper tube shall be carefully erected and neatly arranged.

1. Copper tube shall be run parallel with walls inside structures and shall be pitched to drain.

2. Drain valves shall be installed at the low points of liquid filled systems.

3. Valved fill connections shall be provided for closed systems.

C. Copper tube installed for a compressed air or gas system shall be pitched in the direction of flow.

1. Connections shall be at the top of the main.

2. Low points of the system shall have drip pipes not less than 12 inches long and drain pet-cocks unless automatic moisture traps are shown.

D. Unions shall be provided on copper tube systems with soldered joints.

1. Unions shall be located at control valves, solenoid valves, moisture and steam traps, other items of connected equipment and as shown on Contract Drawings.

2. Unions shall be of cast bronze or brass construction.

3. Dielectric unions shall be used when connecting copper tube to ferrous metals.

E. Copper tubing shall be supported and anchored in place by the use of copper or brass units spaced not greater than 10 feet on center and each side of each change of direction.

3.05 FIELD TESTING AND CHLORINATION

A. Perform hydrostatic and leakage tests in accordance with the applicable provisions of the Section entitled "Leakage Tests", at the test pressure specified or scheduled.

B. Disinfect piping and appurtenances in accordance with the Section entitled "Chlorination", where specified or scheduled.

-END OF SECTION-

SECTION 02630

TAPPED CONNECTIONS

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes tapping and installing of corporation stops and valves on existing or newly installed pipes without interruption of service, as shown on the Contract Drawings, complete with connections and accessories.

B. Installing of curb stops and boxes where specified or directed.

1.02 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards and specifications, except where more stringent requirements have been specified herein:

1. American Water Works Association (AWWA)

1.03 SUBMITTALS

A. In addition to those submittals identified in the General Provisions, the following items shall be submitted:

1. Detail drawings for each size corporation stop, curb stop, tapping sleeve and valve, and service box.

PART 2 PRODUCTS

2.01 CORPORATION STOPS

A. Corporation stops shall be threaded to conform to AWWA C800 with standard corporation stop thread at the inlet. The outlet shall be fitted with coupling nut for flared tube service unless otherwise specified.

SEE SECTION 01600 MATERIAL AND EQUIPMENT for APPROVED MANUFACTURE.

2.02 CURB STOPS

A. Curb stops shall be threaded to conform to AWWA C 800 with coupling nuts for flared tube service.

1. ¾-inch shall be of the inverted new type.

2. 1-inch to 2-inch shall be of the plug-type with "O" ring seals to withstand a minimum working pressure of 175 psi.

3. *SEE SECTION 01600 MATERIAL AND EQUIPMENT* for APPROVED MANUFACTURE.

2.03 SERVICE CLAMPS

A. Service clamps shall be designed for use on the type of pipe to which the connection is being made.

1. Ductile iron and asbestos-cement service clamps shall be the double strap type with neoprene gaskets.

2. Polyvinyl chloride pipe service clamps shall be of a full circle design with a minimum width of 2 inches.

3. Prestressed concrete pipe service clamps shall be made by or approved for use by the pipe manufacturer.

4. *SEE SECTION 01600 MATERIAL AND EQUIPMENT* for APPROVED MANUFACTURE.

2.04 SERVICE BOXES

A. Service boxes shall be constructed of cast iron and sized for the curb stop upon which it is being installed.

1. Stationary shut-off rod shall be provided unless otherwise specified.

2. Boxes shall be telescopic with a minimum of 1-foot adjustment.

3. *SEE SECTION 01600 MATERIAL AND EQUIPMENT* for APPROVED MANUFACTURE.

2.05 TAPPING SLEEVES AND VALVES

A. Tapping sleeves and valves shall be used for connections larger than 2 inches.

1. Tapping sleeves shall be designed and sized in accordance with the recommendations of the manufacturer.

2. Working pressure shall be 200 psi unless higher pressures are scheduled.

3. The seal of the tapping sleeve shall be mechanical joint or low lead 2.5% or less. Low lead as conforming to current regulations.

4. Valves for tapping sleeves shall be designed for the intended service and shall conform to the requirements of the Section entitled "Valves".

5. *SEE SECTION 01600 MATERIAL AND EQUIPMENT* for APPROVED MANUFACTURE.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install connections and accessories under the direction of personnel who have performed at least ten similar connections in accordance with the configuration shown on the Contract Drawings and the applicable provisions of the referenced Standards.

1. Threaded taps shall be made using a machine designed for cutting, threading and inserting the corporation without interruption of service.

a. Teflon tape may be used on corporation threads.

2. Tapping sleeve connections shall be made using a machine to cut and remove the segment through the valve without interruption of service.

B. Service boxes shall be set plumb and shall be independently supported on two bricks so no weight will be transmitted to the curb stop or carrier pipe.

C. Service clamps and tapping sleeves installed on prestressed concrete pipe shall be encased in a minimum of 2 inches of concrete mortar after installation.

-END OF SECTION-

SECTION 02640

VALVES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The Contractor shall furnish and install valves and miscellaneous piping appurtenances, as indicated on the Drawings and as herein specified.

B. The Drawings and Specifications direct attention to certain features of the equipment, but do not purport to cover all the details of their design. The equipment furnished shall be designed and constructed equal to the high quality equipment manufactured by such firms as are mentioned hereinafter, or as permitted by the Engineer. The Contractor shall furnish and install the equipment complete in all details and ready for operation.

C. Electrical work and equipment specified herein shall conform to the requirements of the applicable electrical sections.

D. Enclosures shall be of a suitable type for the atmospheres in which they are installed.

E. Sizes and capacities not specified herein are indicated on the Drawings.

F. Valves required within pre-engineered pump stations are not covered by this specification section.

PART 2 – PRODUCTS

2.01 BUTTERFLY VALVES

A. Butterfly valves and operators shall conform to the AWWA Standard Specifications for rubber seated butterfly valves, Designation C504, Class 150, except as hereinafter specified. Valves shall have a minimum 150 psi pressure rating.

B. All butterfly valves shall be of cast iron body per ASTM A-126, Class B. Valve discs shall be of ductile iron per ASTM A-536 and provide uninterrupted 360 degree seating edge. Permanently self-lubricating body bushings shall be provided and shall be sized to withstand bearing loads. Valve shafts shall be Type 304 stainless steel with V-type packing. O-ring seals are not acceptable.

C. Valve seats shall be full resilient seats of Buna - N or Hycar and retained in the body or on the disc edge. If the resilient seat is in the body, the disc shall conform to ASTM A-436 Type 1 (Ni-Resist) or gray/ductile iron with corrosion resistant seating surface. If the resilient seat is mounted on the disc edge, it shall be securely attached with Type 304 stainless steel retaining ring or pins. The disc seating edge shall be Type 316 stainless steel.

D. Valve operators shall be electric actuators as specified elsewhere in the specifications. The valve shaft and actuators shall be designed for both torsional and shearing stresses when the valve is operated under its greatest torque.

E. All valves shall conform with the latest revision of AWWA Standard for Butterfly Valves for Ordinary Water Service, AWWA C504. *SEE SECTION 01600 MATERIAL AND EQUIPMENT* for APPROVED MANUFACTURE.

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CONTRACT DOCUMENTS
and
SPECIFICATIONS

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OCT 20 2009
PUBLIC SERVICE
COMMISSION

CONTRACT NO. 9

Administration Building

Sandy Hook Water District
Sandy Hook, Kentucky

April, 2009
O'Brien & Gere Project No. 43011

O'Brien & Gere Engineers, Inc.
1019 Majestic Drive, Suite 110
Lexington, Kentucky 40513
(859) 223-0137

O'BRIEN & GERE

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O'BRIEN & GERE

ADDENDUM NO. 1

SANDY HOOK WATER DISTRICT
CONTRACT NO. 9
ADMINISTRATION BUILDING

BID DATE: Thursday, July 23, 2009 at 11 AM (local time)

This Addendum No.1 and its noted revisions and attachments to the Drawings and/or Specifications shall supplement, amend, and become a part of the Bidding Documents, Drawings, and Specifications. All Bids and Construction Contracts shall be based on these modifications.

ADDITION - SPECIFICATIONS

SECTION 09680 - CARPETING - Add the attached pages, 1-3.

SECTION 13600 PREFABRICATED METAL BUILDING

PART 2 – PRODUCTS - Add to Item G 1. "The liner panel shall be MBCI type I L-240-0, 24 gauge, 24" wide by 1 ½" thick, smooth finish.

PART 2 – PRODUCTS - Add Item J: "The soffit panels on the underside of the canopies should be mounted to a horizontal subframe".

REPLACEMENT – SPECIFICATIONS

SECTION 11000 – BANK EQUIPMENT

PART 2 – PRODUCTS – **Replace** Item D with the following: After hour depository unit is to be a Diebold 163- 34, including a 163-32 locker. The entire unit shall be provided by the contractor.

DELETION - PLANS

SHEET SD-2 – Delete standard detail for Asphalt Curb and Asphalt Curb Opening details

SHEET SD-3 – Delete standard detail for Bituminous Paving Section

ADDITION – PLANS

SHEET SD-3 – Add "Van Access" signage to Handicapped Parking detail.

SHEET C-2 -- Add the following note: " Concrete sidewalk entrance shall be sloped for handicapped accessibility"

SHEET A-5 – Add to A/A5 "The split faced CMU shall be at an elevation 4'0" above finish floor. The metal siding Overlaps the CMU top course. The elevation for the top of all CMU walls shall be 4'8".

SECTION 09680

CARPETING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Provide carpet installation and carpet accessories where shown on the Drawings, as specified herein, and as needed for a complete and proper glue-down installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
2. Concrete Work: Section 03300.
3. Resilient Tile Flooring: Section 09650.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01300.

B. Submit two samples of each carpet to be used and manufacturer's standard colors.

B. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

C.

C. Submit manufacturer's warranties, flame and smoke tests.

PART 2 - PRODUCTS

2.1 CARPET

A. Provide carpet under alump sum allowance of $30.00 per sq. yd. for material and installation in all areas scheduled for carpet.

B. Carpet: 100% continuous filament nylon with antimicrobial processing and permanent static control, as manufactured by Wellco, Patcraft, or approved equal.

1. Yarn construction: Patterned loop, microweave.
2. File Fiber: 100% bulk continuous nylon with antilsoil protectant.
3. Face Yarn: Denier / ply 5200 / 6.
4. Pile Height: 11/64" x 1/8".
5. Gauge: 5/64.
6. Pile Weight: 30 oz.
7. Stitch count: 10.3 min.

8. Primary Backing. 100% woven polypropylene.
9. Color: As selected by Owner.
10. Smoke density ASTM-E-662 below 45 degrees.
11 Flame spread rating ASTM E84: Class 1, flame spread 0 – 25.

2.2 OTHER MATERIALS

A. Adhesives:

1. Provide white latex carpet adhesive such as recommended for the purpose by the manufacturer of the selected carpet.
2. Provide seam adhesive such as recommended for the purpose by the manufacturer of the selected carpet.

B. Provide other materials, not specifically described but required for a complete and proper installation.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Notify the Contractor of conditions which may be detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 SURFACE PREPARATION

A. Immediately prior to installation of the work of this Section, thoroughly clean substrata and remove oil, grease, paint, varnish, hardeners, and other items which would adversely affect the bond of adhesive.

B. Make substrata level and free from irregularities. Assure one constant floor height after carpet is installed, filling low spots and grinding high spots as required.

3.3 INSTALLATION

A. General:

1. Glue directly to the floor, using no pads and no foam.
2. Scribe the carpet accurately to vertical surfaces.
3. Align the lines of carpet, as woven, using no fill strips less than 6" wide, laying all carpet in the same direction.

B. Seams:

1. Locate seams to the maximum extent practicable out of the way of traffic.
2. Fabricate seams by the compression method, using a butt joint, and properly bead and seal.
3. Do not stretch seams.

C. In addition to the cleaning requirements stated elsewhere, thoroughly clean carpet and adjacent surfaces prior to final acceptance of the carpeted areas by the Owner.

3.4 PROTECTION

A. Provide a heavy non-staining paper or plastic walkway as required over carpeting in direction of traffic, maintaining intact until carpeted space is accepted by the Owner.

3.5 SURPLUS MATERIAL

A. Allow the Owner to inspect and select from scrap carpet remaining after the installation. Bundle, wrap in burlap, and deliver to the Owner the carpet scraps selected by him.

END OF SECTION

CONTRACT DOCUMENTS
and
SPECIFICATIONS

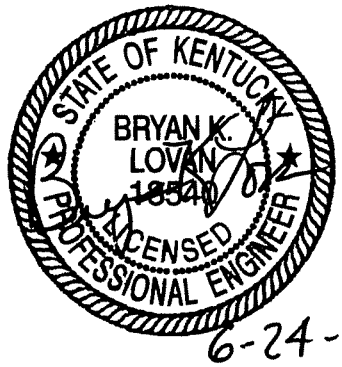
CONTRACT NO. 9

Administration Building

Sandy Hook Water District
Sandy Hook, Kentucky

April, 2009
O'Brien & Gere Project No. 43011

O'Brien & Gere Engineers, Inc.
1019 Majestic Drive, Suite 110
Lexington, Kentucky 40513
(859) 223-0137



6-24-09

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INFORMATION FOR BIDDERS

ADVERTISEMENT FOR BIDS

Sealed bids for Contract 8 - Water System Improvements and Contract 9 – Administration Building for the Sandy Hook Water District, Sandy Hook, Kentucky, will be received at the Sandy Hook Water District Office, 1000 Howards Creek Road, Sandy Hook, Kentucky, 41171 until 11 a.m., Local Time, Thursday, July 23, 2009 and then publicly opened and read aloud.

Contract No.8- The program of work for which bids are to be submitted consists of approximately 16,000 LF of pipe, and a pre-fabricated hydropnuematic pump station including all related appurtenances as described in the specifications and plans.

The contract time allotted for the completion of this contract is one hundred and eighty consecutive calendar days for the pump station only, and ninety (90) consecutive calendar days for all other items in the contract.

Contract No. 9 – The program of work for which bids are to be submitted consists of a new office building, paving, site work, electrical, plumbing and all related appurtenances as described in the specifications and plans.

The contract time allotted for the completion of this contract is two hundred and forty calendar days.

The work is located in Elliott County, Kentucky: Drawings, Specifications and Contract Documents may be examined at:

O'BRIEN & GERE ENGINEERS, INC. 1019 Majestic Dr., Suite 110, Lexington Kentucky 40513
Phone: (859) 223-0137

SANDY HOOK WATER DISTRICT 1000 Howards Creek Road, Sandy Hook, Kentucky 41171

AGC/McGraw Hill, 950 Contract St. Suite 100, Lexington, KY 40505

Reed Construction Data, 30 Technology Parkway South, Ste. 500, Norcross, GA 30092

Builders Exchange, 2300 Meadow Drive, Louisville, KY 40213

Copies of the Specifications, Plans, and Contract Documents may be obtained from Lynn Imaging., 328 Vine Street, Lexington, Kentucky 40507, Phone (859) 255-1021, upon receipt of a non-refundable amount of $150.00. for contract 8 and $200 for contract 9.

State Wage Rates apply for both projects

Hearing impaired individuals may call 1-800-247-2510 for information.

No Bidder may withdraw his Bid within ninety (90) days after the actual date of bid opening.

Bidders on this work will be required to comply with Title VI of the Civil Rights Act of 1964, the Anti-Kickback Act, and the Contract Work Hours Standard Act.

Bidders must comply with the President's Executive Orders No. 11246 and No. 11375 and any amendments or

supplements to those Executive Orders.

Attention of bidders is particularly called to the requirements as to conditions of employment to be observed under the contract, Section 3, Segregated Facility, Section 109 and E.O. 11246.

Bidders must certify they do not and will not maintain or provide for their employees any facilities that are segregated or based on race, color, creed, or national origin.

Minorities and small businesses are encouraged to submit bids on this project.

The Sandy Hook Water District reserves the right to waive any bidding informalities and to reject any or all bids.

Qualified bidders must be registered plan holders.

The sealed bid for these projects shall be clearly marked on the outside of the envelope: Sealed Bid for Contract No.8 - 2008 Water System Improvements or sealed bid for Contract 9 – Administration Building for the Sandy Hook Water District. The bids may be mailed to: Sandy Hook Water District, P.O. Box 726, Sandy Hook, Kentucky 41171.

Sandy Hook Water District
Barry Blair, Chairman

INFORMATION FOR BIDDERS

SECTION 2

INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL INSTRUCTIONS AND INFORMATION

1.01 Each Bidder is responsible for inspecting the work site and for being thoroughly familiar with the Contract Documents, including Addenda. The Bidder shall in no way be relieved from any bidding obligation because of unfamiliarity with the site or documents. Neither the Owner nor Engineer assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

1.02 All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply throughout the Contract and they will be deemed to be included in the Contract the same as though herein written out in full.

1.03 The Owner of the Project is The Sandy Hook Water District.

1.04 The Engineer of the Project is O'Brien & Gere Engineers, Inc., 1019 Majestic Drive, Suite 110, Lexington, Kentucky 40513, Phone 859-223-0137, Mr. Riley Sumner, Project Manager.

1.05 The Contract Documents contain the provisions for construction of the Project. Information obtained from an officer, agent, or employee of the Owner, or from any other person, shall not affect the risk or obligation assumed by the Contractor or relieves the Contractor from fulfilling any of the conditions of the Contract.

1.06 The Owner may make such investigations as deemed 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 an investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Agreement and to complete the Work.

PART 2 - SPECIAL INSTRUCTIONS AND INFORMATION

2.01 The Contract will be awarded based on the lowest responsible bid.

PART 3 - BIDDING PROCEDURE

3.01 Bids will be received by The Sandy Hook Water District, until 11:00 A.M. (local time) Thursday, July 23, 2009, and then publicly opened and read aloud at said office.

3.02 Each Bid must be submitted in a sealed envelope, addressed to The Sandy Hook Water District, Sandy Hook Kentucky. The bid may be mailed to: Sandy Hook Water District, P.O. 726 Sandy Hook, Kentucky 41171 . Each envelope containing a Bid must be plainly marked on the outside as "Sealed Bid for Contract No. 9– Administration Building for The Sandy Hook Water District," and the envelope shall bear on the outside the Bidder's name, address and license number, if applicable, and date and time of opening. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed to The Sandy Hook Water District, P.O. Box 726 Sandy Hook, Kentucky 41171.

3.03 All Bids must be made on the required bid form. All blank spaces for Bid prices must be filled in, in ink or typewritten, and the Bid form must be fully completed and executed when submitted. Each bid must be submitted on the prescribed form and accompanied by the required certificates. All foregoing certifications must be fully completed and executed when submitted.

3.04 Each Bid must be accompanied by a separate Bid Bond for the Contract payable to the Owner for five (5) percent of the total amount of the Bid on the Contract. As soon as the Bid prices are compared, the Owner will return the Bonds of all except the three lowest responsible Bidders. When the Agreements are executed, the Bonds of the two remaining unsuccessful Bidders will be returned. The Bid Bonds of the successful Bidder will be retained until the Payment Bonds and Performance Bonds have been executed and approved, after which it will be returned. Certified checks payable to the Owner, equal to five (5) percent of the Bids, may be substituted for the Bid Bonds.

3.05 **All bids must be made on the required Bid Form and must be fully completed and executed with original signatures and corporate seals. All Bid Bonds must be original forms and accompanied by the required certificates, original signatures and seals. Any Bids without original documents or a conditional or qualified Bid will not be accepted.**

3.06 A Bid may be withdrawn prior to the scheduled time for the opening of Bids, or authorized postponement thereof. A Bid received after the time and date specified will not be considered. No Bidder may withdraw a Bid within ninety (90) days after the actual date of the opening. Should the Contract not be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the Bidder.

3.07 The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof. The Owner may waive any bidding informalities or minor defects or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered.

3.08 A conditional or qualified Bid will not be accepted.

3.09 The Bidder shall supply the names and addresses of major suppliers and subcontractors as part of the Bid Proposal.

3.10 The quantities listed in the Bid Schedule are estimates only. Final payment will be based on unit prices and actual or plan quantities of work performed.

3.11 The Owner reserves the right to add, delete or change any part or portion of the proposed work. Any changes made by the Owner that affect the work will be compensated for.

3.12 Any bidder may modify his/her bid by telegraphic communication at any time prior to the scheduled closing time for receipt of bids, provided such telegraphic communication is received by the Owner prior to the closing time, and provided further, the Owner is satisfied that a written confirmation of the telegraphic modification over the signature of the bidder was mailed prior to the closing time. The telegraphic communication should not reveal the bid price but should provide the addition or subtraction or other modification so that the final prices or terms will not be known by the Owner until the bid is opened. If written confirmation is not received within two days from the closing time, no consideration will be given to the telegraphic modification.

3.13 The successful bidder, upon failure or refusal to execute and deliver the contract and bonds required within 10 days after receiving notice of the acceptance of their bid, shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited (Bid Bond) with the bid.

3.14 Each bidder must inform themselves 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/her obligation to furnish all material and labor necessary to carry out the provisions of the contract. Insofar as possible, the contractor, in carrying out the work, must employ such methods or means as will not cause any interruption of or interference with the work of any other Contractor.

3.15 No interpretation of the meaning of the plans, specifications or other pre-bid documents will be made to any bidder orally.

Every request for such interpretation should be in writing addressed to Mr. Riley Sumner, O'Brien & Gere Engineers, Inc., 1019 Majestic Drive, Lexington, Kentucky 40513, Phone 859-223-0137, and to be given consideration

must be received at least five days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if used, will be mailed to all prospective bidders (at the respective addresses furnished for such purposes), not later than three days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his/her bid as submitted. All addenda so issued shall become part of the contract documents.

3.16 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 of his/her bid.

PART 4 - AWARD OF CONTRACT (AGREEMENT)

4.01 Award of Contract will be made to the lowest responsible Bidder for the Contract unless all Bids are rejected. The Owner reserves the right to reject any and all bids, to waive any bidding informalities, and to disregard all nonconforming, non-responsive or conditional bids. Discrepancies between words and figures will be resolved in favor of words. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

4.02 The Bidder to whom the Contract is awarded will be required to execute the Agreement and obtain the Performance Bond and Payment Bond within ten (10) calendar days from the date of the Notice of Award. The Notice of Award will be accompanied by the necessary Agreement and Bond forms. In case of failure of the Bidder to execute the Agreement, the Owner may consider the Bidder in default, in which case the Bid Bond accompanying the proposal shall become the property of the Owner.

4.03 A Performance Bond and a Payment Bond each in the amount of 100 percent (100%) of the Contract Price, with a corporate surety approved by the Owner, will be required for the faithful performance of the Contract. Such Bonds shall not be dated with a date earlier than the date of Agreement for the Contract (Project) being bonded.

4.04 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.

4.05 The Owner within ten (10) calendar days of receipt of acceptable Performance Bond, Payment Bond and Agreement signed by the Bidder to whom the Agreement was awarded, shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the Owner not execute the Agreement within such period, the Bidder may, by written notice, withdraw the signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the Owner.

4.06 The Notice to Proceed shall be issued by the Owner within ten (10) calendar days of the execution of the Agreement by the Owner. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the Owner and Contractor. If the Notice to Proceed has not been issued within the specified periods or the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party.

- END OF SECTION -

INFORMATION FOR BIDDERS

SECTION 3

BIDDING PROVISIONS

PART 1 - HOURS AND WAGES

1.01 No laborer, workman or mechanic in the employ of the Contractor, Subcontractor or other person doing or contracting to do the whole or part of the work contemplated by this Contract shall be permitted or required to work more than eight hours in any one calendar day or more than five days in any one week except in cases of extraordinary emergency, including fire, flood or danger to life or property.

1.02 Each laborer, workman or mechanic employed by the Contractor, Subcontractor or other person about or upon the work under this contract shall be paid no less than the prevailing rate of wages and shall be provided the supplements not less than the prevailing supplements as determined by the Fiscal Officer pursuant to Article 8 of the Labor Law. The prevailing rate schedule as determined by the Fiscal Officer follows this section and is a part of this Contract. Wage rates redetermined in accordance with the law will be transmitted, when received, to the Contractor and will become a part of this Contract at no cost to the Owner. Any person employed on the site of the work in an occupation not listed in the following prevailing rate schedule shall be paid not less than the minimum rate per hour and shall be provided not less than the supplements designated by the Fiscal Officer.

PART 2. DISCRIMINATION PROHIBITED

The Contractor agrees, in accordance with the applicable provisions of the Labor Law of the State of Kentucky:

2.01 That in the hiring of employees for the performance of work under this Contract or any subcontract hereunder, no Contractor, Subcontractor nor any person acting on behalf of such Contractor or Subcontractor, shall by reason of race, creed, color, national origin, or sex discriminate against any citizen of the State of Kentucky who is qualified and available to perform the work to which the employment relates;

2.02 That no Contractor, Subcontractor, nor any person on his behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under this Contract on account of race, creed, color, national origin, or sex;

2.03 That this Contract may be canceled or terminated by the Owner and all monies due or to become due hereunder may be forfeited, for a second or any subsequent violation of the terms or conditions of this section of the Contract;

2.04 The aforesaid provisions of this section covering every contract for or on behalf of the State or a municipality for the manufacture, sale or distribution of materials, equipment or supplies shall be limited to operations performed within the territorial limits of the State of Kentucky.

PART 3 - WORKER'S COMPENSATION

3.01 This Contract shall be void and of no effect unless the person or corporation making or performing such contract shall secure compensation for the benefit of, and keep insured during the life of such contract, such employees, in compliance with the provisions of the worker's compensation law.

PART 4 - LIEN LAW

4.01 The attention of the Contractor is invited to the provisions of the Lien Law of the State of Kentucky, wherein funds received by a contractor for a public improvement are declared to constitute trust funds in the hands of such contractor to be applied first to the payment of certain claims.

Steven L. Beshear
Governor

Daniel Mongiardo
Lieutenant Governor

KENTUCKY LABOR CABINET
DEPARTMENT OF WORKPLACE STANDARDS
DIVISION OF EMPLOYMENT STANDARDS
APPRENTICESHIP & MEDIATION
1047 US Hwy 127 S - Suite 4
Frankfort, Kentucky 40601
Phone (502) 564-3534
Fax (502) 564-2248
www labor ky gov

J. R. Gray
Secretary

Mark S. Brown
Deputy Secretary

Michael L. Dixon
Commissioner

June 16, 2009

Riley Sumner
O'Brien & Gere
1019 Majestic Drive Ste 100
Lexington KY 40513

Re: Sandy Hook Water District, Contract 9 - 2008 Administrative Building & Filter Building Roof Replacement

Advertising Date as Shown on Notification: June 24, 2009

Dear Riley Sumner:

This office is in receipt of your written notification on the above project as required by KRS 337.510 (1).

I am enclosing a copy of the current prevailing wage determination number CR 4-28, dated January 5, 2009 for ELLIOTT County. This schedule of wages shall be attached to and made a part of the specifications for the work, printed on the bidding blanks, and made a part of the contract for the construction of the public works between the public authority and the successful bidder or bidders.

The determination number assigned to this project is based upon the advertising date contained in your notification. There may be modifications to this wage determination prior to the advertising date indicated. In addition, if the contract is not awarded within 90 days of this advertising date or if the advertising date is modified, a different set of prevailing rates of wages may be applicable. It will be the responsibility of the public authority to contact this office and verify the correct schedule of the prevailing rates of wages for use on the project. Your project number is as follows: 032-H-00036-09-4, Heavy/Highway

Sincerely,

Michael L. Dixon
Commissioner

ERRATUM

Refer to the Locality Number and Determination Number listed below published by the Kentucky Labor Cabinet, Division of Employment Standards, Apprenticeship and Mediation on January 5, 2009.

Locality Number 028 – Elliott, Fleming, Lawrence and Rowan counties

Determination Number CR-4-028

DELETE:

PLUMBERS/PIPEFITTERS:	BASE RATE	$25.70
	FRINGE BENEFITS	$17.48

INSERT:

PLUMBERS/PIPEFITTERS	BASE RATE	$25.70
	FRINGE BENEFITS	$17.91

Michael L. Dixon

Michael L. Dixon, Commissioner
Department of Workplace Standards
Kentucky Labor Cabinet
Frankfort KY 40601

This 21st day of January, 2009

KENTUCKY LABOR CABINET
PREVAILING WAGE DETERMINATION
CURRENT REVISION
LOCALITY NO. 028

Determination No. CR-4-028

Date of Determination: January 5, 2009

PROJECT #032-H-00036-09-4

_____BLDG __xx____H/H

This schedule of the prevailing rate of wages for Locality No. 028, which includes Elliott, Fleming, Lawrence and Rowan Counties, has been determined in accordance with the provisions of KRS 337.505 to 337.550. This determination shall be referred to as Prevailing Wage Determination No. CR-4-028.

Apprentices shall be permitted to work as such subject to Administrative Regulations adopted by the Executive Director of the Office of Workplace Standards. Copies of these regulations will be furnished upon request to any interested person.

Overtime is to be computed at not less than one and one-half (1 1/2) times the indicated BASE RATE for all hours worked in excess of eight (8) per day, and/or in excess of forty (40) per week. However, KRS 337.540 permits an employee and employer to agree, in writing, that the employee will be compensated at a straight time base rate for hours worked in excess of eight (8) hours in any one calendar day, but not more than ten (10) hours worked in any one calendar day, if such written agreement is prior to the over eight (8) hours in a calendar day actually being worked, or where provided for in a collective bargaining agreement. The fringe benefit rate is to be paid for each hour worked at a straight time rate for all hours worked. Fringe benefit amounts are applicable for all hours worked except when otherwise noted. Welders will receive rate for craft in which welding is incidental.

No laborer, workman or mechanic shall be paid at a rate less than that of the General Laborer except those classified as bona fide apprentices registered with the Kentucky State Apprenticeship Supervisor unless otherwise specified in this schedule of wage rates.

NOTE: The type of construction shall be determined by applying the following definitions.

BUILDING CONSTRUCTION

Building construction is the construction of sheltered enclosures with walk-in access for the purpose of housing persons, machinery, equipment, or supplies. It includes all construction of such structures, the installation of utilities and the installation of equipment, both above and below grade level, as well as incidental grading, utilities and paving.

CR-4-028
January 5, 2009

HIGHWAY CONSTRUCTION

Highway construction includes the construction, alteration or repair of roads, streets, highways, runways, taxiways, alleys, trails, paths, parking areas, and other similar projects not incidental to building or heavy construction. It includes all incidental construction in conjunction with the highway construction project.

HEAVY CONSTRUCTION

Heavy projects are those projects that are not properly classified as either "building" or "highway". For example, dredging projects, water and sewer line projects, dams, flood control projects, sewage treatment plants and facilities, and water treatment plants and facilities are considered heavy.

Michael L. Dixon
COMMISSIONER
KENTUCKY LABOR CABINET

CLASSIFICATIONS		RATE AND FRINGE BENEFITS	
ASBESTOS/INSULATION WORKERS: (Mechanical only)		BASE RATE FRINGE BENEFITS	$28.83 15.53
BOILERMAKERS:		BASE RATE FRINGE BENEFITS	$28.70 15.74
BRICKLAYERS:			
Bricklayers:		BASE RATE FRINGE BENEFITS	$25.49 14.33
Sawmen, power tools, and swing/scaffold:		BASE RATE FRINGE BENEFITS	$27.18 14.33
Carbon or acid brick:		BASE RATE FRINGE BENEFITS	$26.40 14.33
Hot pay and gunnite:		BASE RATE FRINGE BENEFITS	$27.23 14.33
CARPENTERS:			
Carpenters:	BUILDING	BASE RATE FRINGE BENEFITS	$19.46 12.47
Piledrivermen:	BUILDING	BASE RATE FRINGE BENEFITS	$19.86 12.47
Carpenters:	HEAVY & HIGHWAY	BASE RATE FRINGE BENEFITS	$18.35 5.80
Piledrivermen:	HEAVY & HIGHWAY	BASE RATE FRINGE BENEFITS	$18.00 5.80
Divers:	HEAVY & HIGHWAY	BASE RATE FRINGE BENEFITS	$30.30 5.43

CLASSIFICATIONS	RATE AND FRINGE BENEFITS	
CEMENT MASONS:	BASE RATE	$ 22.84
	FRINGE BENEFITS	6.22

First 10 to 50 feet - .25 pr hour above base rate, .01 per foot for every additional foot above 50 feet. This shall include Swing Suspended Scaffolds or chairs and all other high and hazardous work. Working ten (10) feet below ground level or more shall receive .25 above base rate scale for hazardous work.

ELECTRICIANS:	BASE RATE	$29.32
	FRINGE BENEFITS	17.93

Cable splicers, specialized welders, and men working 30 – 100 feet with no floor level (excluding pole or tower work done by linemen, and a scaffold originating from floor level which complies with appropriate State Code) shall be paid 5% above BASE RATE. Men working 100 feet and over shall receive double workmens rate of pay.

ELEVATOR CONSTRUCTORS:	BASE RATE	$28.25
	FRINGE BENEFITS	5.19

ELLIOTT & LAWRENCE COUNTIES:

GLAZIERS:	BASE RATE	$19.96
	FRINGE BENEFITS	1.40

FLEMING COUNTY:

GLAZIERS:	BASE RATE	$15.45

ROWAN COUNTY:

GLAZIERS:	BASE RATE	$9.05

IRONWORKERS:	BASE RATE	$26.87
	FRINGE BENEFITS	16.09

CLASSIFICATIONS		RATE AND FRINGE BENEFITS	
LABORERS:			
BUILDING GROUP 1:			
Laborers, carpenter tenders, cement finisher helpers, concrete men, wreckers, handling of empty oxygen and acetylene bottles, environmental laborers, hole watch and fire watch:			
	BUILDING	BASE RATE	$23.22
		FRINGE BENEFITS	10.70
BUILDING GROUP 2:			
Deck & scow men:	BUILDING	BASE RATE	$23.32
		FRINGE BENEFITS	10.70
BUILDING GROUP 3:			
Hod Carriers & mortar men, later & plaster helpers:			
	BUILDING	BASE RATE	$23.37
		FRINGE BENEFITS	10.70
BUILDING GROUP 4:			
Wrapping, heating & applying hot & cold tar on all pipes, applying tape on pipes and operation of tester:			
	BUILDING	BASE RATE	$23.39
		FRINGE BENEFITS	10.70
BUILDING GROUP 5:			
Jackhammer, electrical gas or air driven tools, burning torch, wagon drill operators, tile layers, handling of all creosote material, signal men, tool room men and asphalt raker:			
	BUILDING	BASE RATE	$23.47
		FRINGE BENEFITS	10.70
BUILDING GROUP 6:			
Rock and powder men:	BUILDING	BASE RATE	$24.45
		FRINGE BENEFITS	10.70
BUILDING GROUP 7:			
Sand hog & mucker:	BULDING	BASE RATE	$23.85
		FRINGE BENEFITS	10.70
BUILDING GROUP 8:			
Caisson worker:	BUILDING	BASE RATE	$24.42
		FRINGE BENEFITS	10.70

CLASSIFICATIONS		RATE AND FRINGE BENEFITS	
LABORERS/HEAVY HIGHWAY			
General laborer, flagman, steam jenny:			
	HEAVY & HIGHWAY	BASE RATE	$16.40
		FRINGE BENEFITS	5.80
Hand blade operator, batch truck dumper, deck hand or scow man:			
	HEAVY & HIGHWAY	BASE RATE	$16.65
		FRINGE BENEFITS	5.80
Power driven tool operator of the following: wagon drill, chain saw, jack hammer, concrete saw, sand blaster, concrete chipper, pavement breaker, vibrator, power wheelbarrow, power buggy. Sewer pipe layer, bottom men, dry cement handler, concrete rubber, mason tender:			
	HEAVY & HIGHWAY	BASE RATE	$16.75
		FRINGE BENEFITS	5.80
Asphalt lute and rakerman, side rail setter:			
	HEAVY & HIGHWAY	BASE RATE	$16.80
		FRINGE BENEFITS	5.80
Gunnite nozzle man, gunnite operator:			
	HEAVY & HIGHWAY	BASE RATE	$16.90
		FRINGE BENEFITS	5.80
Tunnel laborer (free air):	HEAVY & HIGHWAY	BASE RATE	$16.95
		FRINGE BENEFITS	5.80
Tunnel mucker (free air):	HEAVY & HIGHWAY	BASE RATE	$17.00
		FRINGE BENEFITS	5.80
Tunnel miner, blaster and driller (free air):			
	HEAVY & HIGHWAY	BASE RATE	$17.35
		FRINGE BENEFITS	5.80
Caisson worker:	HEAVY & HIGHWAY	BASE RATE	$17.90
		FRINGE BENEFITS	5.80
Powderman:	HEAVY & HIGHWAY	BASE RATE	$18.00
		FRINGE BENEFITS	5.80
Drill operator of percussion type drills which are both powered and propelled by an independent air supply:			
	HEAVY & HIGHWAY	BASE RATE	$19.20
		FRINGE BENEFITS	5.80

CLASSIFICATIONS	RATE AND FRINGE BENEFITS	
MARBLE, TILE & TERRAZZO:		
SETTERS	BASE RATE	$22.39
	FRINGE BENEFITS	5.60
FINISHERS	BASE RATE	$15.39
	FRINGE BENEFITS	4.90
MILLWRIGHTS:	BASE RATE	$20.79
	FRINGE BENEFITS	14.04

OPERATING ENGINEERS:

BUILDING:

Auto patrol, batcher plant, bituminous paver, cableway, central compressor plant, clamshell, concrete mixer (21 cfm or over), concrete pump, crane, crusher plant, derrick, derrick boat, ditching and trenching machine, dragline, dredge operator, dredge engineer, elevating grader and all types of loaders, hoe type machine, hoist (1 drum when used for stack or chimney construction or repair), hoisting engine (2 or more drums), locomotive, motor scraper, carry-all scoop, bulldozer, heavy duty welder, mechanic, orangepeel bucket, piledriver, power blade, motor grader, roller (bituminous), scarifier, shovel, tractor shovel, truck crane, winch truck, push dozer, highlift, forklift (regardless of lift height and except when used for masonry construction), all types of boom cats, core drill, hopto, tow or push boat, A-Frame winch truck, concrete paver, gradeall, hoist, hyster, pumpcrete, Ross carrier, boom, tail boom, rotary drill, hydro hammer, mucking machine, rock spreader attached to equipment, scoopmobile, KeCal loader, tower cranes (French, German and other types), hydrocrane, backfiller, gurries, sub-grader, tunnel mining machines including moles, shields, or similar types of tunnel mining equipment:

BUILDING	*BASE RATE	$21.43
	FRINGE BENEFITS	8.02

Cable Crane Operators (50-ton and over), hydraulic crane (100-ton and over):

BUILDING	*BASE RATE	$21.98
	FRINGE BENEFITS	8.02

***Operators on cranes with booms one hundred fifty (150) feet and over (including jib) shall receive fifty ($.50) cents above base rate.**

CLASSIFICATIONS — RATE AND FRINGE BENEFITS

All air compressors (over 900 cfm), bituminous mixer, joint sealing machine, concrete mixer (under 21 cu. ft.), form grader, roller (rock), tractor (50 hp and over), bull float, finish machine, outboard motor boat, flexplane, fireman, boom type tamping machine, truck crane oiler, greaser on grease facilities servicing heavy equipment, switchman or brakeman, mechanic helper, whirley oiler, self-propelled compactor, tractair and road widening trencher and farm tractor with attachments (except backhoe, highlift and endloader), elevator (regardless of ownership when used for hoisting any building materials), hoisting engine (1 drum or buck hoist), forklift (when used for masonry construction, Firebrick masonry excluded), well points, grout pump, throttle-valve man, tugger, electric vibrator compactor:

BUILDING	BASE RATE	$18.42
	FRINGE BENEFITS	8.02

Bituminous distributor, cement gun, conveyor, mud jack, paving joint machine, roller (earth), tamping machine, tractors (under 50 hp), vibrator, oiler, concrete saw, burlap and curing machine, hydro-seeder, power form handling equipment, deckhand steersman, hydraulic post driver, and drill helper:

BUILDING	BASE RATE	$17.57
	FRINGE BENEFITS	8.02

HEAVY HIGHWAY CLASS A:
A-Frame Winch Truck, Auto Patrol, Backfiller, Batcher Plant, Bituminous Paver, Bituminous Transfer Machine, All types of Boom Cats, Bulldozer, Cableway, Carry-All Scoop, Carry Deck Crane, Central Compressor Plant Operator, Clamshell, Concrete Mixer (21 cu. ft. or over), Concrete Paver, Truck-Mounted Concrete Pump, Core Drills, Crane, Crusher Plant, Derrick, Derrick Boat, Ditching and Trenching Machine, Dragline, Dredge Operator, Dredge Engineer, Earth Movers, Elevating Grader and all types of Loaders, Grade-All, Gurries, Heavy Equipment Robotics Operator/Mechanic, Highlift, Hoe-Type Machine, Hoist (two or more drums), Hoisting Engine (two or more drums), Horizontal Directional Drill Operator, Hydraulic Boom Truck, Hydrocrane, Hyster, KeCal Loader, Letourneau, Locomotive, Mechanic, Mechanically Operated Laser Screed, Mechanic Welder, Mucking Machine, Motor Scraper, Orangepeel Bucket,Piledriver, Power Blade, Pumpcrete, Push Dozer, Rock Spreader attached to Equipment, All Rotary Drills, Roller (bituminous), Scarifier, Scoopmobile, Shovel, Side Boom, Subgrader, Tailboom, Telescoping Type Forklift, Tow or Push Boat, Tower Cranes (French, German and other types), Tractor Shovel, Truck Crane, Tunnel Mining Machines including Moles, Shields, or Similar types of Tunnel Mining Equipment:

HEAVY & HIGHWAY	BASE RATE	$20.35
	FRINGE BENEFITS	7.90

Operators on cranes with booms one hundred fifty feet (150') and over including jib shall receive $.50 above base rate.

CLASSIFICATIONS — RATE AND FRINGE BENEFITS

HEAVY HIGHWAY CLASS B:
All Air Compressors (over 900 cu. ft. per min.), Bituminous Mixer, Boom Type Tamping Machine, Bull Float, Concrete Mixer (under 21 cu. ft.), Electric Vibrator Compactor/Self-Propelled Compactor, Elevator (one drum or buck hoist), Elevator (regardless of ownership when used to hoist building material), Finish Machine, Firemen, Flex-Plane, Forklift (regardless of lift height), Form Grader, Hoist (one drum), Joint Sealing Machine, Mechanic Helper, Outboard Motor Boat, Power Sweeper (riding type), Roller (rock), Ross Carrier, Skid Mounted or Trailer Mounted Concrete Pumps, Switchman or Brakeman, Throttle Valve Man, Tractair and Road Widening Trencher, Tractor (50 HP and over), Truck Crane Oiler, Tugger, Welding Machine, Well Points, and Whirley Oiler:

HEAVY & HIGHWAY	BASE RATE	$17.93
	FRINGE BENEFITS	7.90

HEAVY HIGHWAY CLASS B2:
Greaser on Grease Facilities servicing Heavy Equipment:

HEAVY & HIGHWAY	BASE RATE	$18.31
	FRINGE BENEFITS	7.90

HEAVY HIGHWAY CLASS C:
Bituminous Distributor, Burlap and Curing Machine, Caisson Drill and Core Drill Helper (track or skid mounted), Cement Gun, Concrete Saw, Conveyor, Deckhand Oiler, Grout Pump, Hydraulic Post Driver, Hydro Seeder, Mud Jack, Oiler, Paving Joint Machine, Power Form Handling Equipment, Pump, Roller (earth), Steermen, Tamping Machine, Tractors (under 50 H.P.) and Vibrator:

HEAVY & HIGHWAY	BASE RATE	$17.67
	FRINGE BENEFITS	7.90

All Heavy Highway operators assigned to work below ground level are to be paid ten percent (10%) above base wage rate. This does not apply to open cut work.

PAINTERS:

Brush and Roller:	BASE RATE	$21.22
	FRINGE BENEFITS	11.59
Drywall, Tape and Wallcovering:	BASE RATE	$21.22
	FRINGE BENEFITS	11.59

Spray painting, floor sanding, power tools, sandblasting, steam cleaning pressure washing, lead abatement, hazardous waste, toxic chemicals, epoxy coatings, two-component materials

	BASE RATE	$22.34
	FRINGE BENEFITS	11.59

CLASSIFICATIONS		RATE AND FRINGE BENEFITS	
PLASTERERS:		BASE RATE	$22.84
		FRINGE BENEFITS	6.22

First 10 to 50 feet $.25 per hour above base rate, $.01 per foot for every additional foot above 50 feet. This shall include Swing Suspended Scaffolds or chairs and all other high and hazardous work. Working ten (10) feet below ground level or more shall receive $.25 above base rate scale for hazardous work.

PLUMBERS/PIPEFITTERS:		BASE RATE	$25.02
		FRINGE BENEFITS	17.10

ROOFERS: (Excluding Metal Roofs) BASE RATE		$13.50	
		FRINGE BENEFITS	1.90

SHEETMETAL WORKERS: (Including Metal Roofs)		BASE RATE	$23.12
		FRINGE BENEFITS	11.50

SPRINKLER FITTERS:		BASE RATE	$27.05
		FRINGE BENEFITS	12.90

TRUCK DRIVERS:

Truck Drivers:	BUILDING	BASE RATE	$9.50
		FRINGE BENEFITS	.72
Truck helper and warehouseman:			
	HEAVY & HIGHWAY	BASE RATE	$16.65
		FRINGE BENEFITS	5.80
Driver, winch truck & A-frame truck when used in transporting material:			
	HEAVY & HIGHWAY	BASE RATE	$16.75
		FRINGE BENEFITS	5.80
Driver, semi-trailer or pole trailer, dump truck, tandum axle, and driver of distributors:			
	HEAVY & HIGHWAY	BASE RATE	$16.85
		FRINGE BENEFITS	5.80
Driver on mixer trucks/all types:	HEAVY & HIGHWAY	BASE RATE	$16.90
		FRINGE BENEFITS	5.80

CLASSIFICATIONS		RATE AND FRINGE BENEFITS	
TRUCK DRIVES (CONTD)			
Truck mechanic:	HEAVY & HIGHWAY	BASE RATE	$16.95
		FRINGE BENEFITS	5.80
Driver, 3 tons & under, tire changer & truck mechanic helper:			
	HEAVY & HIGHWAY	BASE RATE	$16.98
		FRINGE BENEFITS	5.80
Driver of pavement breakers:	HEAVY & HIGHWAY	BASE RATE	$17.00
		FRINGE BENEFITS	5.80
Driver, over 3 tons & truck mounted rotary drill:			
	HEAVY & HIGHWAY	BASE RATE	$17.19
		FRINGE BENEFITS	5.80
Driver, Euclid & other heavy earth moving equipment & low boy:			
	HEAVY & HIGHWAY	BASE RATE	$17.76
		FRINGE BENEFITS	5.80
Greaser on greasing facilities:	HEAVY & HIGHWAY	BASE RATE	$17.85
		FRINGE BENEFITS	5.80

END OF DOCUMENT CR-4-028
JANUARY 5, 2009
Page 11 of 11

SECTION 00300

BID FORMS

PART 1 - BIDDER'S PROPOSAL FORM

BIDDER'S PROPOSAL
SANDY HOOK WATER DISTRICT
CONTRACT NO. 9 - ADMINISTRATION BUILDING

Proposal of _____ (hereinafter called "BIDDER"), organized and existing under the laws of the State of _____, doing business as _____ (insert "a corporation", "a partnership", or "an individual" as applicable). Sandy Hook Water District (hereinafter called "OWNER").

In compliance with the Advertisement for Bids, BIDDER hereby proposes to furnish all equipment, materials and labor for the work required to construct **Contract No. 9- Administration Building, Sandy Hook Water District, Sandy Hook**, Kentucky in strict accordance with the Contract Documents, within the time set forth therein, and at the price stated below.

BID SCHEDULE

ITEM NO.	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL BID AMOUNT
1		LS	**100' x 50' Pre-Fabricated Metal Office Building w/3 Bay Storage Facility including Foundation, Electrical, Plumbing, Grading, Site Work and Appurtenances. Including All Fees, Permits, and Licenses per all Regulative Agencies.**		
2		LS	**7' high security fencing and one 16' sliding gate**		
3		LS	**Bituminous Asphalt Pavement w/Sub-Base Crushed Stone. Painting and Marking.**		
4		LS	**Field Collection of GIS Data, Software, Training, and Two Lap Top Computers. Complete in Place.**		

TOTAL AMOUNT BID - (ABOVE ITEMS): _____ Dollars and

_____ (Cents) (_____).

The above prices shall include all labor, materials, overhead, profit, insurance and other costs necessary to cover the finished work of the several kinds called for. The price per foot for pipe installation includes all labor, materials, unclassified excavation, rock blasting and removal, clean-up, etc. for a finished product. Changes in the work shall be processed in accordance with the General Provisions.

By submission of this Bid, the BIDDER certifies, and in the case of a joint Bid each party thereto certifies as to its own organization, that this Bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this Bid, with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence work under this Contract on or before a date to be specified in the Notice to Proceed and to fully complete the project within **Two Hundred and Forty (240)** consecutive calendar days thereafter. BIDDER further agrees to pay as liquidated damages, the sum of $ 300.00 for each consecutive calendar day thereafter as provided in the General Provisions.

Accompanying this Proposal is a certified check or standard Bid Bond in the sum of _____(Dollars) ($_____) in accordance with the Instructions to Bidders. The BIDDER, by submittal of this Bid, agrees with the OWNER that the amount of the bid security deposited with this Bid fairly and reasonably represents the amount of damages the OWNER will suffer due to the failure of the BIDDER to fulfill his agreements as provided in this Proposal.

BIDDER acknowledges receipt of the following Addenda:

_____

_____

BIDDER agrees that the OWNER reserves the right to delete the whole or any part of the Project from the Contract.

BIDDER understands that the OWNER reserves the right to reject any or all Bids and to waive any informalities in the Bidding.

BIDDER agrees that this Bid shall be good and may not be withdrawn for a period of ninety (90) calendar days after the actual date of bid opening.

BIDDER agrees to perform all of the Work described in the Specifications and shown on the Plans for the amount stated above. Within ten (10) calendar days after receiving written notice of the acceptance of this Bid by the OWNER, the BIDDER will execute and deliver to the OWNER ten (10) copies of the Agreement and such other required Contract Documents.

BIDDER:

_____

By_____

Title_____

Address _____

(Seal - If bid is by a corporation)

_____

Date Signed_____

END OF SECTION

SECTION 00400

SUPPLEMENTS TO BID FORMS

ALL PARTS ARE REQUIRED TO BE COMPLETED AND MUST BE SUBMITTED WITH THE BID. FAILURE TO COMPLETE ALL FORMS MAY BE CAUSE FOR REJECTION OF THE BID.

PART 1 - BIDDER'S QUALIFICATIONS

A. The required names and addresses of all persons interested in the foregoing Bid, as Principals, are as follows:

B. The Bidder shall submit the requested information indicated and for work of a similar character in size and total contract price that is included in the proposed Contract and references to enable the Owner to judge the Bidder's experience, skill and business standing.

1. Number of years in business as a contractor under present business name:

_____

2. Number of years of experience in type of construction required for this project:

_____

3. Have you ever been declared in default or failed to complete work awarded to you? If yes, where and why?_____

_____

4. Have you ever been cited by a regulatory agency for failure to comply with any of its contractual obligations?_____. If yes, where and why?_____

_____

5. List and age of owned equipment available for this project:_____

_____

6. List similar project experience with references where the Bidder was the prime contractor and percent work completed as prime and percent completed by subcontractors.

Project Name	Description of Work	Date Completed	Contract Amount	% Prime/ % Subcontract	Owner/Contact	Owner Phone No.
1.						
2.						
3.						
4.						
5.						

(Add supplementary pages if necessary)

PART 2 - SUBCONTRACTORS

All proposed subcontractors shall be listed below for each branch of work included in the proposed Contract. All subcontractors are subject to the approval of the Owner. Failure to submit a completed list may be cause for rejection of the Bid. Experience and references of all subcontractors shall be described on separate pages.

BRANCH OF WORK	NAME AND ADDRESS OF SUBCONTRACTOR
Electrical	_____
Mechanical	_____
Paving	_____
Fencing	_____
Plumbing	_____
_____	_____

(Other)

(Add supplementary pages if necessary)

NOTES:

1. The OWNER in no way implies acceptance of any proposed subcontractor by acceptance of the Bid.
2. The CONTRACTOR will not be allowed to substitute subcontractors not listed herein without prior written approval of OWNER.
3. The CONTRACTOR shall indicate the percent or amount of work proposed by subcontractors for the total project or each branch of work listed.

SUBCONTRACTORS' REFERENCES

List similar project experience with references for each subcontractor proposed and the percent work completed by the subcontractors.

Project Name	Description of Work	Date Completed	Contract Amount	% Prime/ % Subcontract	Owner/Contact	Owner Phone No.
1.						
2.						
3.						
4.						
5.						

(Add supplementary pages if necessary)

PART 3 - MANUFACTURER'S LIST

A. The Bidder proposes to furnish the following equipment contingent upon its conformity to the Specifications and review and acceptance by the ENGINEER and OWNER.

B. Only one manufacturer's name is to be listed.

NAME OF MANUFACTURER	DESCRIPTION OF MATERIAL
_____	Building
_____	HVAC
_____	GIS System
_____	
_____	
_____	
_____	_____
_____	

(Add supplementary pages if necessary)

NOTES:
1. OWNER in no way implies acceptance of such listed equipment by acceptance of the Bid.
2. The CONTRACTOR will not be allowed to substitute manufacturers not listed for the units above without prior written approval of OWNER.

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned,

_____ as Principal, and

_____ as Surety, are hereby held and firmly bound unto _____ as OWNER in the penal sum of _____ for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed, this _____ day of _____, 2009. The Condition of the above obligation is such that whereas the Principal has submitted to _____a certain BID, attached hereto and hereby made a part hereof to enter into a contract in writing, for **Contract No. 9 – Administration Building.**

NOW, THEREFORE,

(a) If said BID shall be rejected, or

(b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attachment hereto (Properly completed in accordance with said BID) and shall furnish a BOND for 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 be signed by their proper officers, the day and year first set forth above.

(SEAL)

Principal (Legal Signature)

(SEAL)

Surety

By

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

DEBARRED FIRMS

The undersigned hereby certifies that the firm of _____ has not and will not award a subcontract, in connection with any contract awarded to it as the result of this bid, to any firm that has been debarred for noncompliance with the Federal Labor Standards, Title VI of the Civil Rights Act of 1964, Executive Order 11246 as amended or any other Federal Law.

Name of Firm Submitting Bid

Signature of Authorized Official

Title

Date

CERTIFIED COPY OF CORPORATE RESOLUTION

(Name of Company)

I hereby certify that I am the duly elected and acting (Insert Title of Officer) _____, a Corporation duly organized and existing under the laws of the State of _____; that on the _____ day of _____, 2009, the Board of Directors of said Corporation authorized and approved a certain Proposal to **Sandy Hook Water District** for the construction of certain improvements for **Contract No. 9 – Administration Building** by said Corporation and any contract resulting there from, and empowered the _____ (Insert Title of Officer) of said Corporation to execute said Proposal and Contract for and in behalf of said Corporation; that said authority is not contrary to any provision in the Articles of Incorporation or code of regulations or code of bylaws of said Corporation; ;that said authority has not been rescinded or modified; and that _____ (Insert Name of Signatory) is the duly elected and acting _____ (Insert Title of Office) of said Corporation.

IN WITNESS WHEREOF, I have hereunto subscribed my name on _____, 2009.

(Signature)

Subscribed and sworn to before me this _____ day of _____, 2009.

(SEAL)

NOTARY PUBLIC

NONCOLLUSION AFFIDAVIT

State of _____)

County of _____)

Bid Identification
Contractor,
being first duly sworn, deposes and says that he is
_____(sole owner, a partner, president, secretary, etc.) of _____, the party making the foregoing bid; that such bid is not made in the interest of or on behalf of any undisclosed person, partnership, company, association, organization, or corporation; that such bid is genuine and not collusive or sham; that said bidder has not directly b or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that said bidder has not in any manner, directly or indirectly, sought by agreement, communication or conference with anyone to fix the bid price of said bidder or of any other bidder, or to fix any overhead, profit, or cost element of such bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract or anyone interested in the proposed contract; that all statements contained in such bid are true; and, further that said bidder has not, directly or indirectly, submitted his bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid and will not pay any fee in connection therewith, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, or to any other individual except to such person or persons as have a partnership or other financial interest with said bidder in his general business.

SIGNED

TITLE

Subscribed and sworn to before me this _____ day of _____, 2008.

(SEAL)

NOTARY PUBLIC

- END OF SECTION -

SECTION 00500

AGREEMENT FORMS

PART 1 - NOTICE OF AWARD

TO:

PROJECT Description: Contract No. 9 Administration Building for the Sandy Hook Water District, Sandy Hook, Kentucky.

The OWNER has considered the BID submitted by you for the above-described WORK in response to its Advertisement for Bids dated _____, and Instructions to Bidders.

You are hereby notified that your BID has been accepted for items in the amount of $_____.

You are required by the Instructions to Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, and Payment BOND and certificates of insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID 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 to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this _____ day of _____, 2009.

OWNER

By

Title Chairman

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by _____, this the _____ day of _____, 2009.

By

Title

PART 2 - AGREEMENT

THIS AGREEMENT, made this the _____ day of _____,2009, by and between the **Sandy Hook Water District** hereinafter called "OWNER" and _____doing business as ("a corporation", "a partnership", or "an individual" as applicable), hereinafter called "CONTRACTOR".

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

1. Contractor will commence and complete the construction of the Contract No. 9 –Administration Building for the Sandy Hook Water District.

2. The following documents shall constitute integral parts of this AGREEMENT, the whole to be collectively known and referred to as the CONTRACT DOCUMENTS and in the case of discrepancies among any parts of the CONTRACT DOCUMENTS, the most stringent shall apply.

3. The CONTRACTOR will furnish all of the materials, supplies, tools, equipment, labor and other services necessary for the construction and completion of the PROJECT described herein.

4. The CONTRACTOR will commence the work required by the CONTRACT DOCUMENTS within ten (10) calendar days after the date of the NOTICE TO PROCEED and will complete the same within **Two Hundred and Forty (240)** consecutive calendar days unless the period for completion is extended otherwise by the CONTRACT DOCUMENTS.

5. The CONTRACTOR agrees to perform all of the WORK described in the CONTRACT DOCUMENTS and comply with the terms therein for the sum of: _____as shown in the Bid Schedule.

6. The term "CONTRACT DOCUMENTS" means and includes the following:

(A) Advertisement for Bids
(B) Instructions to Bidders
(C) Bid
(D) Bid Bond
(E) Agreement
(F) General Provisions
(G) Supplemental General Conditions
(H) Special Conditions
(I) Payment Bond
(J) Performance Bond
(K) Notice of Award
(L) Notice to Proceed
(M) Change Order
(N) Drawings prepared by O'BRIEN & GERE ENGINEERS, INC., and dated April, 2009
(O) Technical Specifications prepared and issued by O'BRIEN & GERE ENGINEERS, INC. dated April, 2009.
(P) Addenda: None

7. The OWNER will pay to the CONTRACTOR in the manner and at such times as set forth in the General Conditions such amounts as required by the CONTRACT DOCUMENTS.

8. This AGREEMENT shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors and assigns.

IN WITNESS WHEREOF, the parties hereto have executed or caused to be executed by their duly authorized officials, this AGREEMENT in six (6) copies each of which shall be deemed an original on the date first above written.

Sandy Hook Water District
OWNER

By_____
(Signature)

Name_____
(Print Name)
Title Chairman

(SEAL)

ATTEST:

(Signature)

Name
(Print Name)
Title

_____
CONTRACTOR

By_____
(Signature)

Name _____
(Print Name)
Address _____

_____

(SEAL)

ATTEST:

(Signature)

Name
(Print Name)

Title

PART 3 - NOTICE TO PROCEED

TO: _____

_____

_____

_____

You are hereby notified to commence WORK in accordance with the AGREEMENT date _____, 2009, on or before _____, 2009, and you are to complete the WORK within **240 consecutive** calendar days thereafter. The date of completion of all WORK is therefore _____, 2009.

SANDY HOOK WATER DISTRICT
OWNER

By_____
(Signature)

Title Chairman

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED
is hereby acknowledged by:

this the _____ day of _____, 2009

CONTRACTOR

By_____

Title President

- END OF SECTION -

SECTION 00600

BONDS AND CERTIFICATES

PART 1 - PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENT: 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 _____

Sandy Hook Water District
(Name of Owner)

1000 Howards Creek Road
(Address of Owner)

hereinafter called OWNER.

_____.

_____Dollars ($_____)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, 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 _____, 2009, a copy of which is hereto attached and made a part hereof for the construction of:

_____

PART 1 - PERFORMANCE BOND (Cont'd.)

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 the PRINCIPAL 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.

PROVIDED, FURTHER, that the liability of the PRINCIPAL and SURETY shall be subject to the same limitations and defenses as may be available to them against a claim hereunder by the OWNER.

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 AGREEMENT or to WORK to be performed thereunder or the Specifications accompanying same shall in any way 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 it is expressly agreed that the BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the AGREEMENT not increasing the Contract Price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the AGREEMENT as so amended. The term "Amendment", wherever used in this BOND, and whether referring to this BOND, the AGREEMENT or the Loan Documents shall include any alteration, addition, extension, or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the OWNER and the PRINCIPAL shall abridge the right of the other beneficiary hereunder, whose claim may be unsatisfied. The OWNER is the only beneficiaries hereunder.

PART 1 - PERFORMANCE BOND (Cont'd.)

IN WITNESS WHEREOF, this instrument is executed in __6__ counterparts, each one of which shall be deemed an original, this the _____ day of _____, 2009.

ATTEST:

_____
PRINCIPAL

_____
(PRINCIPAL) Secretary

By_____(s)

SEAL:

Address_____

_____

_____
Witness as to PRINCIPAL

Address_____

_____

ATTEST:

_____
SURETY

_____
Witness to SURETY

By_____
Attorney-In-Fact

Address_____

Address_____

_____

_____

NOTE: Date of BOND must not be prior to date of AGREEMENT.
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.

PART 2 - PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

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

_____
(Name of Surety)

hereinafter called SURETY, are held and firmly bound unto _____

SandyHook Water District
(Name of Owner)

1000 Howards Creek Road, Sandy Hook, Kentucky 40322
(Address of Owner)

hereinafter called OWNER.

_____Dollars ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, 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 AGREEMENT with the OWNER dated the _____ day of _____, 2009, 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, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extensions or modifications 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 for all labor cost incurred in such WORK including that by a SUBCONTRACTOR, and to any mechanic or materialman lienholder whether it acquires its lien by operation of State or Federal law; then this obligation shall be void, otherwise to remain in full force and effect.

PART 2 - PAYMENT BOND (Cont'd.)

PROVIDED, that beneficiaries or claimants hereunder shall be limited to the SUBCONTRACTORS, and persons, firms, and corporations having a direct contract with the PRINCIPAL or its SUBCONTRACTORS.

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 way 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 this contract or to the WORK or to the Specifications.

PROVIDED, FURTHER, that no suit or action shall be commenced hereunder by any claimant: (a) Unless claimant, other than one having a direct contract with the PRINCIPAL (or with the RUS in the event the RUA is performing the obligations of the OWNER), shall have given written notice to any two of the following: The PRINCIPAL, the OWNER, or the SURETY above named within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the PRINCIPAL, OWNER, or SURETY, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer; (b) After the expiration of eighteen (18) months following the date of which PRINCIPAL ceased work on said Contract, it being understood, however, that if any limitation embodied in the BOND is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

PROVIDED, FURTHER, that it is expressly agreed that this BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the Contract Price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the Contract as so amended. The term "Amendment", wherever used in this BOND and whether referring to this BOND, the Contract or the Loan Documents shall include any alteration, addition, extension or modification of any character whatsoever.

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.

PART 2 - PAYMENT BOND (Cont'd.)

IN WITNESS WHEREOF, this instrument is executed in __6__ counterparts, each one of which shall be deemed an original, this the _____ day of _____, 2009.

ATTEST:

_____
PRINCIPAL

_____
(PRINCIPAL) Secretary

By_____(s)

SEAL:

Address_____

_____

_____
Witness as to PRINCIPAL

Address_____

_____

ATTEST:

_____
SURETY

_____
Witness to SURETY

By_____
Attorney-In-Fact

Address_____

Address_____

_____

_____

NOTE: Date of BOND must not be prior to date of AGREEMENT.
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.

END OF SECTION

O'BRIEN & GERE

GENERAL PROVISIONS

GENERAL PROVISIONS

SECTION 1

DEFINITIONS

GP-1.01. DEFINITIONS

Whenever the words herein defined or pronouns used in their stead, occur in this Contract, they shall have the meaning given below:

ADDENDUM or **ADDENDA** shall mean the additional contract provisions issued in writing by the Owner prior to the receipt of bids.

BID shall mean the offer or proposal submitted, signed and sealed, in the form prescribed in the Contract Documents setting forth the prices for the Work to be performed.

BONDS shall mean any or all of the following: performance, payment, labor and material bonds and other instruments of security furnished by the Contractor and his surety or sureties in accordance with the Contract Documents.

CHANGE ORDER shall mean the formal document executed by the Owner incorporating any Modifications into the Contract.

CLAIM shall mean a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and the Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

CONTRACT or CONTRACT DOCUMENTS shall mean any or all of the following: the Advertisement or Invitation, Information for Bidders, Bid, Agreement, General Provisions, Special Provisions, Technical Specifications, Payment Items, Contract Drawings, all interpretations or Addenda thereto and Change Orders issued by the Owner or by the Engineer with the approval of the Owner.

Anything shown on the Contract Drawings and not mentioned in the Specifications or mentioned in the Specifications and not shown on the Drawings, shall have the same effect as if shown or mentioned, respectively, in both.

CONTRACT DRAWINGS shall mean those plans and drawings which show the scope and character of the Work and are specifically referred to as such in these Documents or in any Addendum or Addenda.

CONTRACTOR shall mean the Party of the Second Part to this Contract or the person, persons, partnership or corporations entering into this Contract for the performance of the Work required by it, and the legal representatives of said party or the agents appointed for said party in the performance of the Work.

ELEVATION or any abbreviation of the word shall mean the distance in feet above or below the datum established for the Project.

ENGINEER shall mean the Consulting Engineer or Engineers engaged by the Owner for the project and shall include any properly authorized assistants acting for the Consulting Engineer within the scope of the particular duties assigned to them.

FIELD ORDER shall mean a written notice issued by the Engineer to the Contractor for the purpose of clarifying or interpreting the Contract Documents, or to authorize minor changes or alterations in the Work which will not result in a change in the Contractor's cost or completion time.

INVERT shall mean the inside bottom of a pipe or the surface upon which sewage or water flows along the plan centerline of the completed Work.

MODIFICATION shall mean a written order to the Contractor, signed by the Engineer and the Owner on which is stated the addition, deletion or revision in the Work, together with any adjustment in Contract price or Contract time. One or more Modifications may be incorporated into a Change Order for making payments to the Contractor.

OWNER shall mean the Party of the First Part to this Contract or any person duly authorized to act for said First Party.

PROCEED ORDER shall mean a written order issued by the Owner to the Contractor to proceed with certain Work pending the resolution of disputes.

PROJECT shall mean the entire improvement to which the Contract relates.

SITE shall mean the area included within the property lines shown on the Contract Drawings including temporary easement, and other such areas adjacent thereto as may be designated by the Owner in writing.

SPECIFICATIONS shall mean any or all of the following: the Special Provisions, Technical Specifications, Payment Items and any Addenda pertaining thereto.

SUBCONTRACTOR shall mean any person, firm or corporation other than employees of the Contractor, who or which contracts with the Contractor to furnish, or actually furnishes labor, or labor and materials, or labor and equipment, or labor, materials and equipment at the Site.

SUBGRADE shall mean the bottom line or surface to which excavations are necessarily made for purpose of building the Work in accordance with the Contract Drawings, not including the additional depth of excavation required for any special foundation that may be ordered.

SURETY or SURETIES shall mean the Bondsmen or party or parties who have made secure the fulfillment of the Contract by a Bond and whose signatures are attached to said Bond.

WORK shall mean everything expressly or impliedly required to be furnished and done by the Contractor under the Contract, including extra work.

WRITTEN NOTICE. The term "notice" as used herein shall mean and include all written notices, demands, instructions, claims, approvals and disapprovals required to obtain compliance with contract requirements. Written Notice shall be deemed to have been duly served if: 1) delivered in person to the individual or to a member of the firm or to an officer of the corporation at the location specified in the Contract Documents, or 2) if delivered at the last business address provided by the person to whom addressed, or 3) if sent by certified or registered mail, or ordinary mail, or 4) if sent by facsimile followed by ordinary mail, certified mail, postage paid, return receipt requested, or 5) if sent by nationally recognized overnight carrier (against receipt) or 6) if sent by telegraph to the last business address.

SECTION 2

PERFORMANCE OF WORK

GP-2.01. PERMITS, LAWS AND REGULATIONS

Where the Owner is required to obtain permits for the Project, the permits have been or will be obtained and are noted in the Special Provisions. The Contractor shall take out all other necessary permits from the County, State, municipal or other public authorities; shall give all notices required by the law or municipal ordinances and shall pay all fees and charges incidental to the due and lawful execution of the Work done under this Contract.

The Contractor shall keep itself fully informed for the duration of the Contract of all laws, ordinances, regulations, and applicable codes affecting those engaged or employed in the Work, or the materials used in the Work, or affecting the conduct of the Work, and of all orders, decrees and instructions of bodies or tribunals having jurisdiction or authority over the same. If any discrepancy or inconsistency should be discovered in the Contract Documents in relation to any such law, ordinance, regulation, codes, order, decree, or instruction, the Contractor shall forthwith report the same in writing to the Engineer.

The Contractor shall at all times observe and comply with and shall cause all its agents and employees to observe and comply with all such existing and future laws, ordinances, regulations, codes, orders, decrees and instructions.

Any provisions of these General Provisions which is shown with the agreement of the Owner to contradict or conflict with the mandates of the applicable law in the jurisdiction where the Project is located, shall be interpreted and enforced to comply 1) with, the requirements of the applicable law and 2) to the maximum practicable extent, with the original intent of these General Provisions.

GP-2.02. CARE AND PROTECTION OF THE WORK

From the commencement until the acceptance of the Work, the Contractor shall be solely responsible for the care of the Work covered by the Contract and for the materials, supplies and equipment delivered at the Site intended to be used in the Work; and all injury or damage to the same from whatever cause, shall be made good at his expense. The Contractor shall provide suitable means of protection for and shall protect all materials intended to be used in the Work, all Work in progress, and all completed Work. The Contractor shall take all necessary precautions to prevent injury or damage to the Work by flood, fire, freezing or from inclemencies of the weather.

The Contractor shall neither load nor permit any part of a structure to be loaded with weights that will endanger the structure, and shall not subject any part of the Work to stresses or pressures that will endanger it.

In the event that the Owner must take occupancy and the Contractor is behind schedule, the provisions of the article still apply.

GP-2.03. CLEANING STRUCTURES AND SITE

As the Work progresses, the Contractor shall remove all unused materials, tools, equipment and machinery, waste materials, rubbish, refuse and other debris from the Site and see to it that the Site is at all times maintained in a neat and orderly condition.

At the completion of the Work, the Contractor shall promptly remove all construction tools, equipment and machinery, surplus materials, waste materials, rubbish, refuse and other debris from the Site and leave the Site in a neat and orderly condition. The Contractor shall also see to it that all pipelines, buildings, and other structures are left in a bright, polished, and new-appearing condition.

Whenever the Contractor neglects his responsibilities as set forth above, or neglects the repairing of streets, roadways, passageways or areas, or the repairing of fences or damages, the Engineer will give notice to that effect to

the Contractor. If the Contractor does not take reasonable steps upon receipt of such notice to correct the neglected situation, the Owner may do so, and the expense thereby incurred shall be deducted from any monies due or that may become due to the Contractor.

If a dispute arises between the separate Contractors as to their responsibilities for cleaning up, etc., as required above, the Owner may do such work as it deems appropriate and charge the cost thereof to the several Contractors as it shall determine to be just. The Owner's determination shall be binding and final.

GP-2.04. SANITARY REGULATIONS

Sanitary conveniences in sufficient numbers and convenient locations for the use of all persons employed on the Work, properly screened from public observation, shall be provided, maintained, and removed by the Contractor or by the General Contractor. The contents of the same shall be removed and disposed of in accordance with applicable laws codes and regulations. The Contractor shall rigorously prohibit the committance of nuisances within, on, or about the Work.

The Contractor and each Subcontractor shall supply sufficient drinking water to all of his employees.

The Contractor shall also obey and enforce such other sanitary regulations and orders and shall take such precautions against infectious diseases as may be deemed necessary by the responsible authority.

GP-2.05. FIELD CONTROL OF THE WORK

All work shall be constructed in accordance with the lines, grades and elevations shown on the Contract Drawings or as given by the Engineer in the field. The Contractor shall be fully and solely responsible for maintaining alignment and grade.

Control lines and elevations will be established by the Engineer as outlined in the Special Provisions. The Contractor shall, without additional compensation, provide all stakes, grade boards, cleats, nails, and such other materials and give such assistance to the Engineer as may be required to establish control lines and elevations. The Contractor shall inform the Engineer in writing a reasonable time in advance of the times and places at which he intends to do work in order that control lines and elevations may be established with the minimum of inconvenience to the Engineer or delay to the Contractor.

The Contractor shall protect and safeguard all points, stakes, grade marks, monuments, and bench marks at the Site of the Work, and shall re-establish, at its expense, any marks which are removed or destroyed due to construction operations. The Contractor shall bear the entire expense of rectifying Work improperly installed due to not maintaining or protecting marks, or to removing, without the Engineer's written approval, any such established points, stakes, or marks.

GP-2.06. LAND AVAILABLE TO CONTRACTOR

The Owner will furnish not later than the date when needed by the Contractor, reasonable access to the lands upon which the Work is to be done, rights-of-way for reasonable access thereto, and such other lands which are designated for the use of the Contractor. Land and easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by the Owner.

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

The Contractor shall confine its operations to such portions of the property of the Owner, as may be designated by the Owner from time to time for such use and to the rights-of-way or easements acquired for the Work. Private property adjacent to the Work shall not be entered upon or used by the Contractor for any purpose whatsoever without the written consent of the owner thereof.

All Work in connection with the Contract within or bordering on private or public property shall be conducted in such manner as will cause the minimum inconvenience and disturbance to it. No excavated materials

or supplies of any kind shall be stored on private or public premises without the Owner's written consent and in accordance with all applicable regulations, and all walks and driveways shall be kept open to uninterrupted passage.

The Contractor shall at its expense whenever so required by the Owner, erect and maintain fences along the roadways and around the grounds occupied by the Contractor, which fences shall be sufficient for the protection of the adjoining property and all persons lawfully using the same.

GP-2.07. TRAVEL NOT TO BE OBSTRUCTED

The Contractor shall not allow travel upon any street, park, roadway, or alley to be hindered or inconvenienced needlessly, nor shall the same be wholly obstructed without the written permission of the owner thereof. Upon receipt of such permission the Contractor shall cause plain and properly worded signs announcing such fact to be placed, with proper lighted barricades, at the nearest cross streets, upon each side of such obstructed portion, where travel can pass around the same in the shortest and easiest way.

The driveways to and from all fire department buildings and those required by all manufacturing plants, industrial establishments, and other business concerns for the proper continuance of their commerce shall be kept open and maintained in passable condition at all times unless modified by agreement between the Contractor and the property owner. The Contractor shall give reasonable notice to the owners of all private ways before interfering with them.

The Contractor shall give reasonable written notice to concerned police, bus, fire, ambulance, and school bus departments before initiating any activity which will restrict public travel or access to private property.

GP-2.08. MAINTAINING FLOW OF SEWERS, WATER LINES AND DRAINS

The Contractor shall, at its expense, provide for and maintain the flow of all sewers, drains, house inlet connections, and water courses which may be met with during the progress of the Work. The Contractor shall not allow the contents of any sewer, drain, or house inlet connection to flow into trenches, sewers, or other structures to be constructed under the Contract, and shall at its expense, immediately remove from the vicinity of the Work and cart away to a proper disposal site all offensive matter.

The Contractor shall, at its expense, provide for and maintain the flow in all water mains or laterals which may be met with during the progress of the Work. When water mains or laterals are to be disturbed to the extent that the water will be shut off, the superintendent of the water utility and all parties being served by the lines involved shall be notified 72 hours in advance concerning time and duration of the shut-off period. In cases involving fire hydrants, the fire department shall be so notified.

In the case of accidental damage to a water or sewer line, gas main or electrical conduit, the repairs of such break shall have priority over all other operations. The parties whose services are affected by the break shall be notified at once and all assistance given to supply emergency water, gas, or electricity where necessary by temporary lines, tank truck, or other means. The Contractor shall have the obligation at its expense to assure that all water, gas, electric and sewer connections serving private or public property shall be promptly and correctly restored to the utility company's specifications.

GP-2.09. COLLATERAL WORK

During the progress of the Work the Owner reserves the right to award other contracts relating to the Project or for work on sites adjoining or adjacent to that on which the Work covered by this Contract is to be performed. The Contractor shall afford the other contractors who are parties to such contracts reasonable opportunity for the introduction and storage of materials and equipment and the execution of Work and shall properly connect and coordinate its Work with theirs.

The Contractor shall keep itself informed of the progress and the detail work of other contractors and shall notify the Engineer immediately in writing of lack of progress or defective workmanship on the part of other contractors where such delay or such defective workmanship will interfere with its own operations. Failure of a Contractor to keep informed of the Work progressing on the Site or failure to give notice of lack of progress or

defective workmanship by others shall be construed as acceptance of the status of the Work as being satisfactory for proper coordination with its own Work and shall constitute a waiver of any and all claims against the Owner or Engineer relating thereto in any way.

The Contractor shall do all cutting, fitting, and patching for its Work that may be required to make its several parts come together properly and fit it to receive or be received by the work of others. The Contractor shall not endanger any Work of others by cutting, excavating, or otherwise altering their work, except with the written consent of the other contractor and the Engineer.

If the performance of additional Work is undertaken by other contractors, and if the Contractor believes that the performance of such additional Work will cause additional expense or will require an extension of time, a claim therefor may be made as provided for herein.

The Contractor agrees that it has and will make no claim for damages against the Owner by reason of any act or omission to act by any other contractor or in connection with the Engineer's or Owner's acts or omissions to act in connection with such other contractor, but the Contractor shall have a right to claim such damages from the other contractors, under a provision similar to the following provision which has been or will be inserted in the Contract with such other contractors.

Should any other contractor, having or who shall hereafter have a contract with the Owner relating to the Project or in connection with the Work on sites adjoining or adjacent to that on which the Work covered by this Contract is to be performed, sustain any damage through any act or omission of the Contractor, the Contractor agrees to reimburse such other contractor for all such damages and it further agrees to defend, indemnify, and save harmless the Owner from all claims for such damages by whomever made or presented.

GP-2.10. FURNISHING AND USE OF CONTRACT DOCUMENTS

Unless otherwise stated in the Special Provisions, the Contractor will be furnished, free of charge, three copies of the Contract Documents, including three sets of reduced and three sets of full-size Contract Drawings where drawings have been reduced. Additional sets will be furnished to the Contractor, but only to the limit of availability. Any other copies of the Contract Documents, which the Contractor may desire, can be obtained by the Contractor from the Engineer at the cost of duplication thereof.

The Contractor shall keep at the Site of the Work at least two copies of the Contract Documents and shall at all times provide the Engineer, and other representatives of the Owner, access thereto. One copy shall be available for ready reference and the other shall be used for record purposes.

GP-2.11. RECORD DRAWINGS

The copy of the Contract Drawings provided to the Contractor for record purposes in accordance with Section GP-2.10 above, shall be annotated by the Contractor to record all changes made during the construction process. Said copy shall be available to the Engineer and shall be delivered to the Owner by the Contractor upon completion of the Project.

GP-2.12. SLEEVES, INSERTS, CHASES AND OPENINGS

Where there is more than one Contractor on a Project and unless otherwise designated on the Contract Drawings, the General Contractor shall install in new floors, roofs, walls, and other structures constructed by it all sleeves, inserts, chases, and openings to fit its own Work and that of other contractors. The sleeves and inserts shall be provided by the installers of the pipes, ducts, conduits, and related equipment but shall be placed by the General or otherwise designated Contractor as directed by the installers of the pipes, ducts, conduits and related equipment. It is the responsibility of the General or otherwise designated Contractor to give other contractors reasonable notice as to when items provided by the other contractors will be placed in the Work.

Patching and finishing around the pipes, ducts, conduits, and related equipment after installation shall be by the same Contractor or Contractors installing the pipes, ducts, conduits, and related equipment.

Where sleeves, inserts, chases, or openings are required in existing floors, roofs, walls, and other structures, they shall be installed by the same Contractor or Contractors installing the pipes, ducts, conduits, and related equipment.

GP-2.13. PROVISIONS REQUIRED BY LAW DEEMED INSERTED

Each and every provision required by law to be inserted in this Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though such provisions were included herein. If through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the Contract shall forthwith be physically amended to make such insertion.

GP-2.14. INVALID PROVISIONS

If any term or provision of the Contract Documents or the application thereof to any person, firm or corporation, or circumstance shall, to any extent, be invalid or unenforceable, the remainder of the Contract Documents, or the application of such terms or provisions to persons, firms or corporations, or circumstances other than those to which it is held invalid or unenforceable, shall not be affected thereby and each term or provision of the Contract Documents shall be valid and be enforced to the fullest extent permitted by law.

GP-2.15. APPLICABLE STANDARDS

Reference to codes, manuals or standard specifications of any technical society, organization or association or to the code of any governmental authority, whether such reference be specified or implied, shall mean the latest code, manual or standard specification in effect at the time of opening of the Bids, except as may be otherwise specifically provided in the Contract Documents.

However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of OWNER, CONTRACTOR or ENGINEER, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to ENGINEER, or any of ENGINEER's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of the Contract Documents.

SECTION 3

TIME PROVISIONS

GP-3.01. COMMENCEMENT AND COMPLETION OF WORK: TIME OF ESSENCE

The Contractor shall commence the Work within ten days following the date of notice to proceed and fully complete the Work within the time specified in the Bid. The Contractor shall notify the Engineer, in writing, of its intention to enter upon the Site of the Work at least five days in advance of such entry.

Time is of the essence of this Contract with respect to the Work to be performed. The Contractor shall proceed expeditiously with the Work with adequate forces. The Contractor hereby confirms that the times set forth for completion of the Work are reasonable periods of time for performing and completing the Work.

GP-3.02. RATE OF PROGRESS

The progress of the Work shall be in accordance with the approved schedule and shall be such that all Work under the Contract will be completed within the time specified, or before such later date to which the time of completion may have been extended by the Owner.

The Contractor shall within ten days following the execution of this Contract prepare and submit to the Engineer for approval, two copies of a practical and feasible Work schedule showing the order and date on which the several salient features (including equipment) will be started and completed.

The Work schedule shall be in the form of a cash and resource loaded critical path schedule.

Where there is more than one Contract on the Project, the General Contractor shall, within ten days following the execution of its Contract with the Owner, submit two copies of its own proposed Work schedule to the Engineer for review. After review, sufficient additional copies of the schedule shall be submitted to the Engineer for transmittal of two copies to each of the other Contractors, who shall then prepare and submit their own Work scheduled for review. The General Contractor shall then incorporate these schedules into its schedule.

The Contractor on each Contract shall adhere to the approved Work schedule for its Contract. In the event a Contractor does not adhere to its Work schedule and causes other Contractors to be damaged, the Contractor causing the delay shall defend, indemnify, and save harmless the Owner and Engineer from all actions and charges of the other Contractors against the Owner or Engineer caused by said delay including all costs, disbursements and attorneys' fees.

The Contractor shall update and resubmit its own schedule every month, unless the Engineer requests less frequent updatings.

GP-3.03. EXTENSION OF TIME

If the Contractor is obstructed or delayed in the prosecution or completion of the Work by any cause beyond the control of the Contractor, including the neglect, delay or default of the Owner, Engineer or of any other contractors for adjoining or contiguous work, or by any damage that may happen thereto, unusual action of the elements taking account of the location of the Project, or by the abandonment of the Work by the employees in a general strike, or by any delay on the part of the Owner or Engineer doing work or furnishing material, the Contractor shall have no claim for damages against the Owner or Engineer for any such cause or delay, but may in such case be entitled to a reasonable extension of time specified herein for the completion of the Work, provided, however, that claim for such extension of time be made by the Contractor in writing within thirty calendar days from the time when such alleged cause for delay shall occur. Any extension granted shall constitute the sole and only redress to the Contractor for any claims of any nature whatsoever caused or in any way related to such delay.

An application for an extension of time must set forth in detail using a critical path analysis the source and the nature of each alleged cause of delay in the completion of the Work, the date upon which each such cause of

delay began and ended, and delay attributable to each of such causes. The Contractor shall, however, be entitled to an extension of time for such causes only for the number of calendar days of delay which the Owner may determine to be due solely to such causes, and then only if the Contractor shall have strictly complied with all of the requirements of this Section.

The Contractor shall not be entitled to receive a separate extension of time for each one of several causes of delay operating concurrently, but, if at all, only for the actual period of delay in completion of the Work as determined by the Owner irrespective of the number of causes contributing to produce such delay. If one of several causes of delay operating concurrently results from any act, fault or omission of the Contractor or of his subcontractors or materialmen, and would of itself (irrespective of the concurrent causes) have delayed the Work, no extension of time will be allowed for the period of delay resulting from such act, fault or omission.

SECTION 4

SURFACE AND SUBSURFACE CONDITIONS

GP-4.01. PROTECTION, EXISTING STRUCTURES

It shall be the sole responsibility of the Contractor and at its expense to protect adjacent and other property or premises from damage of any kind during the progress of the Work and shall erect and maintain guards around its Work in such a way as to afford protection to the public. The Contractor shall be held responsible for improper, illegal, or negligent conduct of itself, and its subcontractors, employees and agents in and about said Work or in the execution of the Work covered by this Contract.

It shall be the sole responsibility of the Contractor, and at its expense to sustain in their places and permanently protect from direct or indirect injury any and all pipelines, subways, pavements, sidewalks, curbs, railways, buildings, trees, poles, wells, and other property in the vicinity of his Work, whether over- or underground, or which appear within the trench or excavations, and it shall assume all costs and expenses for direct or indirect damage which may be occasioned by injury to any of them.

The Contractor's liability shall also include the damage or injury sustained by any structure whatsoever due to settlement of trenches or excavations or to settlement or lateral movement of the sides of such trenches or excavations, whether such movement occurs during or after excavation or backfilling of such trenches or excavations. The responsibility to so support and protect all such structures from damage or injury shall continue, without limitation, throughout the Contract period and during the period of guarantee.

The Contractor shall at all times have available onsite suitable and sufficient material and shall use the same as may be necessary or required for sustaining and supporting any and all such structures which are uncovered, undermined, weakened, endangered, threatened, or otherwise materially affected.

In case injury occurs to any portion of a pipeline or structure, or to the material surrounding or supporting the same, through blasting or similar operations, the Contractor shall immediately notify the Engineer, and, at the Contractor's expense, shall remove such injured Work and shall rebuild the pipeline or structure and shall replace the material surrounding and supporting the same, or shall furnish such material and perform such work of repairs or replacements as the Engineer may order. In the case of utilities, the Contractor shall immediately notify the utility company, and provide all assistance for the repair of the utility by the utility company unless authorized to undertake such repairs directly by the utility company. Any damage whatsoever shall be promptly, completely, and satisfactorily repaired by the Contractor at its expense to the satisfaction of the Owner, or owner of the utility.

GP-4.02. EXISTING SUBSURFACE STRUCTURES

(a) General

Certain existing subsurface structures likely to be encountered during the performance of the Work embraced in this Contract or located in close proximity to the Work hereunder as to require special precautions and methods for their protection, such as sewers, drains, water mains, and conduits, together with appurtenances, are shown on the Contract Drawings. The sizes, locations, and depths shown are approximate.

It is the obligation of the Contractor to verify the accuracy and completeness of the information shown, and the Contractor agrees that it shall neither have nor assert against the Owner or Engineer any claim for damages or extension of time or relief from any obligation of this Contract by reason of the inaccuracy, inadequacy, incompleteness, or other deficiency of the information given or the failure to furnish additional or further information in the possession of the Owner or Engineer, except as set forth in subsection (b) and (c) below.

Contractor is hereby given notice that subsurface structures and facilities may be located on the site which are either not identified or are mislocated on the Contract Documents.

Where any existing subsurface structure such as a sewer, drain, gas pipe, water pipe, conduit, or other structure is found which is not anticipated by the Contract Documents or which is found to be materially different in size, location, or depth from that anticipated by the Contract Documents, the Contractor shall immediately notify the Engineer, and also the superintendent of the utility, before disturbing the structure.

Contractor shall use due care to avoid damage to subsurface facilities identified, not identified or mislocated on Contract Documents.

If ordered by the Engineer, such structure shall be uncovered and supported by the Contractor, at its cost and expense, as constituting a part of the Contract, and the Contractor shall not become entitled to claim any damages for or on account of the presence of such structure or the uncovering and supporting of same.

(b) Existing subsurface structures which require changes in the Work of the Contract.

The Engineer will determine whether changes should be made in the Contract Documents for construction of the Work of the Contract to avoid the subsurface structure, whether the Work of the Contract can proceed without changes in the Contract Documents, or whether the structure should be removed, realigned, or changed.

Any increase in cost of the Work resulting from any changes in the Contract Documents necessitated by the unanticipated presence or difference in size, location, or depth of the subsurface structure will be adjusted in the manner provided herein for changes in Contract amount.

(c) Existing subsurface structures which require changes in the existing structure.

Where the size, location, or depth of the existing subsurface structure has been anticipated and the Contract Documents require removal, realignment, or change, all Work under this Contract shall be done in accordance with the Contract Documents in mutual cooperation with the utility or other parties concerned.

Where the presence of the subsurface structure or its size, location, or depth is not anticipated by the Contract Documents, any work by the Contractor required to remove, realign, or change the structure shall be done under the provisions for changes in the Work for the removal, realignment, or change and shall be done as mutually agreed by the Contractor, Engineer, and utility or other parties concerned.

(d) Interruption of Service

Where it is necessary to interrupt water, gas, or other public utility service to remove, realign, or change a subsurface structure, the Work shall proceed with expedience and shall be continuous after interruption of service until completion of the removal, realignment, or change and return of the utility service to its normal state.

GP-4.03. SUBSURFACE CONDITIONS OTHER THAN STRUCTURES FOUND DIFFERENT

Reference is made to the Information for Bidders Section of these Contract Documents and the obligations of the Contractor to perform all necessary subsurface investigations prior to bidding. Furthermore, the Contractor shall not be entitled to rely upon the subsurface investigation performed by the Owner or the Engineer.

GP-4.04. PROTECTION OF UTILITIES

All utilities whose facilities may be affected by the Work of the Contract shall be notified by the Contractor at least 72 hours in advance of the start of any operations which might affect such facilities.

The removal, replacement, support, or other handling of private and public utilities coming within the lines of the Work shall be accomplished by the Contractor at its expense in accordance with arrangements satisfactory to the owner or operator of the utility involved. The Contractor, at its expense, shall remove, replace, or support all utilities as required.

The Contractor shall not permit nor cause any hindrance to or interference with any individual, municipal department, public service corporation, or other company or companies in protecting its or their mains, pipes, poles, posts, or other structures, nor in shifting, removing, or replacing the same. The Contractor shall allow said

individual, department, company, or companies to take all such measures as they may deem prudent to protect their structures.

GP-4.05. REPLACEMENT OF PROPERTY

The Contractor shall replace all pavement, driveways, fences, shrubs, lawns, trees, and any other public or private property damaged as a result of the Work under this Contract. All such replacement shall be done in accordance with the applicable specifications and no separate or extra payment will be made unless specifically provided for in the Payment Items. In all cases said replacement shall be new and at least equal to the original conditions.

SECTION 5

OWNER'S STATUS

GP-5.01. OWNER'S RIGHT TO SUSPEND WORK

If, in the opinion of the Owner the Work is defective, or the Contractor fails to supply sufficient skilled workmen or suitable materials or equipment, or if the Contractor fails to make prompt payments for labor, materials or equipment, or if other good cause exists, the Owner may order the Contractor to suspend the Work or any portion thereof until the cause for such order has been eliminated. This right of the Owner to suspend the Work shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other party. The Contractor shall have no claim or damages against the Owner for any delay due to such suspension of Work, provided, however, that in case of the suspension of Work due to circumstances beyond the control of the Contractor, the time within which the Contractor is required to complete the Work, shall be extended by as many calendar days as the Work was suspended. Such extended time of completion shall be the Contractor's only compensation for the suspension of Work as above provided.

GP-5.02. CONTRACTOR'S DEFAULT

In addition to those instances provided in other sections of this Contract, the Owner shall have the right to declare the Contractor in default of the whole or any part of the Work under conditions including but not limited to:

(a) The Contractor files a voluntary petition in bankruptcy or shall be adjudicated a bankrupt or insolvent, or shall file any petition or answer seeking any reorganization, arrangement, liquidation, dissolution, or similar relief for itself under any statute, law, or regulation, or shall seek or consent to or acquiesce in the appointment of any trustee, receiver, or liquidator of the Contractor, or of all or any substantial part of his properties or assets, or shall make any general assignment for the benefit of creditors, or shall admit in writing to inability to pay its debts generally as they become due; or if

(b) A petition is filed against the Contractor seeking any reorganization, arrangement, liquidation, dissolution, or similar relief under any statute, law, or regulation, and shall remain undismissed or unstayed for an aggregate of thirty days (whether or not consecutive); or if

(c) Any trustee, receiver, or liquidator of the Contractor or of all or any substantial part of its properties or assets is appointed without the consent or acquiescence of the Contractor and such appointment shall remain unvacated or unstayed for an aggregate of thirty days (whether or not consecutive); or if

(d) A receiver or receivers are appointed to take charge of the Contractor's property or affairs; or if

(e) The Contractor fails to commence work when notified to do so by the Owner; or if

(f) The Contractor abandons the Work as evidenced by removing workman, materials or equipment from the site; or if

(g) The Contractor refuses to proceed with the Work when and as directed by the Owner; or if

(h) The Contractor without just cause reduces its working force to a number which, if maintained, would be insufficient, in the opinion of the Owner to complete the Work in accordance with the approved time progress schedule, and fails or refuses to sufficiently increase such working force when ordered to do so by the Owner; or if

(i) The Contractor sublets, assigns, transfers, conveys, or otherwise disposes of the Contract other than as permitted by the contract; or if

(j) The Owner is of the opinion that the Contractor is or has been unnecessarily or unreasonably or willfully delaying the performance and completion of the Work, or the award of necessary subcontracts; or if

(k) The Owner is of the opinion that the Work cannot be completed within the time herein provided therefor or within the time to which such completion may have been extended, provided however, that the impossibility of timely completion is, in the Owner's opinion, attributable to conditions within the Contractor's control; or if

(l) The Work is not completed within the time herein provided therefor or within the time to which the Contractor may be entitled to have such completion extended; or if

(m) The Owner is of the opinion that the Contractor is or has been willfully or in bad faith violating any of the provisions of this Contract; or if

(n) The Owner is of the opinion that the Contractor is not or has not been executing the Contract in good faith and in accordance with its terms.

The Owner's exercise of this right shall not give rise to any claim or cause of action by the Contractor for damages of any nature whatsoever.

Before the Owner shall exercise its right to declare the Contractor in default by reason of the conditions set forth in the above items a, e, f, g, h, j, k, l, m and n, it shall give the Contractor and/or surety three working day's notice of its intention to declare the Contractor in default and unless, within such three day period, the Contractor shall make arrangements satisfactory to the Owner to correct or eliminate the conditions set forth in the Owner's aforesaid notice, the Contractor may be declared in default at the expiration of such three-day period or at the expiration of such longer period of time as the Owner may determine.

The right to declare the Contractor in default for any of the grounds specified or referred to shall be deemed exercised by the Owner sending the Contractor and surety a written notice at the address provided herein setting forth the ground or grounds upon which such default is to be declared. Upon receipt of notice that it is to be declared in default, the Contractor shall do only those acts reasonably related correcting the default or concluding its operations and demobilizing the site; leaving untouched all plant, materials, equipment, tools and supplies then on Site except as the Owner may otherwise direct.

The Owner, after declaring the Contractor in default, may then have the Work completed by such means and in such manner, by contract, with or without public letting, or otherwise, as it may deem advisable, utilizing for such purpose such of the Contractor's plant, materials, equipment, tools, and supplies remaining on the Site, and also such subcontractors as it may deem advisable, or it may call upon the Contractor's surety at its expense to do so.

In the event that the Owner declares the Contractor in default of the Work or any part of the Work, the Contractor, in addition to any other liability to the Owner hereunder or otherwise provided for or allowed by law, shall be liable to the Owner, for all of Owner's costs and expenses, including, without limitation legal fees and expenses the Owner incurs for additional advisory and engineering services necessary, in its opinion, because of the default and, for the total amount of liquidated damages from the date when the Work should have been completed by the Contractor in accordance with the terms hereof to the date of actual completion of the Work, any of which shall be considered as expenses incurred by the Owner in completing the Work and the amount may be charged against and deducted out of such monies as would have been payable to the Contractor or its surety if the Work had been completed without default.

If the Owner completes the Work, the Engineer shall issue a certificate stating the expenses incurred in such completion, including the cost of reletting. Such certificate shall be final, binding, and conclusive upon the Contractor, its surety, and any person claimed under or through the Contractor as to the amount of such expenses, except as may be modified by the Owner to reflect damages incurred.

The costs and expense of such completion, as certified by the Engineer, shall be charged against and deducted out of such monies as would have been payable to the Contractor if it had completed the Work; the balance

of such monies, if any, subject to the other provisions of the Contract, shall be paid to the Contractor without interest after such completion. Should the expense of such completion, as certified by the Engineer, exceed the total sum which would have been payable under the Contract if the same had been completed by the Contractor, such excess shall be paid by the Contractor to the Owner upon demand.

In the event the Owner shall determine to complete the Work without calling upon the Contractor's surety to do so, the Contractor shall not be entitled, from and after the effective date of the declaration of the default, to receive any further payment under the Contract until the said Work shall be wholly completed and accepted by the Owner.

In case the Owner shall declare the Contractor in default as to a part of the Work only, the Contractor shall discontinue such part, shall continue performing the remainder of the Work in strict conformity with the terms of the Contract, and shall not hinder or interfere with any other contractors or persons whom the Owner may engage to complete the Work as to which the Contractor was declared in default.

The provisions relating to declaring the Contractor in default as to the entire Work shall be equally applicable to a declaration of partial default, except that the Owner shall be entitled to utilize for completion of the part of the Work as to which the Contractor was declared in default such plant, materials, equipment, tools, and supplies as the Owner may direct.

In completing the whole or any part of the Work, the Engineer and the Owner shall have the power to depart from or change or vary the terms and provisions of the Contract, provided, however, that such departure, change or variation be made for the purpose of reducing the time or expense of such completion. Such departure, change or variation, even to the extent of accepting a lesser or different performance, shall not affect the conclusiveness of the Engineer's certificate of expense to any action to recover the amount by which such certificate exceeds the amount which would have been payable to the Contractor hereunder but for his default.

GP-5.03. CONTRACTOR PERFORMANCE FOLLOWING DEFAULT

Notwithstanding Owner's declaration of Contractor to be in default of the Work pursuant to GP-5.02, whether such declaration is in-whole or in-part, Contractor, with the written concurrence of Owner, or at the written direction of Owner, may perform mutually agreed upon Work for the benefit of the Owner, including, coordination of suppliers and/or subcontractors, completion of specified portions of the work in progress, and/or correction of defective and/or Guarantee Work. Such mutually agreed upon Work by Contractor shall not modify or supersede Owner's declaration of default, but shall be strictly for the purpose of limiting or reducing the default liability of Contractor to Owner. Contractor shall be paid as provided in the Contract Documents for Work satisfactorily performed pursuant to this GP-5.03.

GP-5.04. OWNER'S RIGHT TO TERMINATE CONTRACT FOR CONVENIENCE

Upon thirty days' written notice to the Contractor and the Engineer, the Owner may without cause and without prejudice to any other right or remedy, elect to abandon the Work and terminate the Agreement. In such event, the Contractor shall be paid for Work executed and expenses sustained plus a reasonable profit.

GP-5.05. NO WAIVER OF RIGHTS

Neither the inspection by the Engineer, Owner, or any of their respective employees or agents, nor any order of the Owner for payment of money, nor any order, measurement or certificate by the Engineer, nor payment for, nor acceptance of the whole or any part of the Work by the Engineer or Owner, nor any extension of time, nor any possession taken by the Owner or its employees or agents shall operate as a waiver of any provision of this Contract, or of any power herein reserved to the Owner or of any right to damages herein provided, and no waiver of any breach of this Contract shall be held to be a waiver of any other subsequent breach. All remedies provided in this Contract to the Owner shall be construed as cumulative, i.e., in addition to each and every other remedy herein provided, and the Owner shall have any and all equitable and legal remedies which it would in any case have.

SECTION 6

INSPECTION OF WORK

GP-6.01. OWNER'S REPRESENTATIVE

The Engineer will be the Owner's representative during the construction period. A representative of the Engineer will make visits to the Site to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in substantial compliance with the Contract Documents. The Engineer will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of the on-site observations, the Engineer will keep the Owner informed of the progress of the Work and will endeavor to guard the Owner against defects and deficiencies in the Work of Contractors. The Engineer may disapprove Work as failing to conform to the Contract Documents. Whenever the Engineer considers it necessary or advisable for the proper carrying out of the intent of the Contract Documents, the Engineer shall have authority to require the Contractor to make special examination or testing of the Work (whether or not fabricated, installed or completed).

No matter how extensive or intensive the Engineer's inspection, the Engineer will not have any duty or obligation with reference to and will not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, and will not be responsible for the Contractor's failure to carry out the Work in substantial compliance with the Contract Documents. The Engineer's duties, services, and work shall in no way supersede or dilute the Contractor's obligation to perform the Work in conformance with all contract requirements. The Engineer is empowered when directed by the Owner to act on its behalf with respect to the proper execution of the Work and to give instructions when necessary to require such corrective measures as may be necessary in the Engineer's professional opinion to endeavor to protect the Owner's interest.

The Engineer is empowered to determine the amount, quality, acceptability, and fitness of all parts of the Work, to interpret the Contract Documents, to waive provisions of the Specifications to meet unforeseen conditions or circumstances revealed or arising during the course of the Work, and to decide all other questions in connection with the Work, but this authority shall not give rise to any duty or responsibility of the Engineer to the Contractor, the subcontractor, or any of their agents or employees to do so.

GP-6.02. ACCESS TO WORK

The Owner, its Engineers, Inspectors, Agents, other employees, and any other parties who may enter into contracts with the Owner for doing work within the territory covered by this Contract shall, for all purposes which may be required by their contracts, and representatives of State and Federal regulatory agencies shall for any purpose have access to the Work and the premises used by the Contractor, and the Contractor shall provide safe and proper facilities therefore. The Contractor shall, whenever so requested, provide to the Engineer access to the proper invoices, bills of lading, etc., and shall provide scales and assistance for measuring and testing any of the materials.

GP-6.03. COVERING OF WORK

No backfilling or covering of underground Work or covering of Work in structures shall be done without authorization by the Engineer. Any Work covered without such authorization shall be uncovered to such extent as directed or removed and replaced by the Contractor at its expense. If covering of the Work is ordered stopped, no more Work shall be done until such order is withdrawn.

SECTION 7

CONTRACTOR'S STATUS

GP-7.01. REPRESENTATIONS OF THE CONTRACTOR

The Contractor represents and warrants:

(a) That it is financially solvent, that its financial condition is in all material respects the same as represented and certified at the time of bidding, and that it is experienced in and competent to perform the type of Work or to furnish the plant, materials, supplies or equipment, to be so performed or furnished by it; and

(b) That it is familiar with all Federal, State, County and Municipal laws, ordinances, and regulations which may in any way affect the Work or those employed therein including, but not limited to, any special acts relating to the Work or to the project of which it is a part; and

(c) That such temporary and permanent Work required by the Contract Documents as is to be done by it can be satisfactorily performed and constructed and used for the purpose for which it is intended and that such construction will not injure any person or damage any property; and

(d) That it has carefully examined the Contract Documents and the Site of the Work and that, from its investigations, it has satisfied itself as to the nature and location of the Work, the character, quality and quantity of surface and subsurface materials and structures likely to be encountered, the character of equipment and other facilities needed for the performance of the Work, the general and local conditions, and all other materials which may in any way affect the Work or its performance.

(e) The Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with each and every phase of the Work. The Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to all employees on the Work and any other persons who may be affected thereby.

GP-7.02. CONTRACTOR'S ADDRESS: NOTICES

Both the address given in the Bid upon which the Contract is founded and the Contractor's office at or near the Site of the Work are hereby designated as places to either of which notices, letters or other communications to the Contractor may be delivered. Notices to the Contractor may be given: 1) by personal delivery to any partner or officer of the Contractor, or, to the Contractor if a sole proprietor, or to any authorized representative of the Contractor, or, 2) by depositing in a postpaid wrapper directed to either of the places above designated in any post office box regularly maintained by the U.S. Postal Department, or, 3) by registered mail, certified mail, postage paid, return receipt requested, or, 4) by facsimile followed by regular mail, or, 5) by nationally recognized overnight courier (against receipt), or, 6) by telegraph. The date of service shall be the date of such delivery or mailing. The first named address may be changed at any time by an instrument in writing executed by the Contractor and delivered to the Owner.

Nothing herein contained shall be deemed to preclude or render inoperative the service of any notice, letter, or other written communication upon the Contractor or his authorized representative personally.

GP-7.03. SUPERVISION AND SUPERINTENDENCE

The Contractor shall continuously supervise and direct the Work efficiently and with its best skill and attention. The Contractor shall have sole responsibility for the means, methods, techniques, sequences, and procedures of construction. The Contractor shall be responsible to see that the finished Work complies accurately with the Contract Documents.

The Contractor acknowledges and agrees that it is fully responsible for the safety, supervision and control of the Work and of Contractor's agents, employees, subcontractors and suppliers and that the Owner and its Officers, employees and agents have no obligation with respect to supervision of Contractor's employees, agents, subcontractors or suppliers and the manner in which the work is performed.

The Contractor shall at all times have a competent superintendent agreeable to the Owner on the Site of the Work who shall have full authority to act for the Contractor and who shall see that the Work under the Contract is executed in accordance with the Contract Documents. The superintendent shall be an authorized representative of the Contractor for the purposes of Section GP-7.02.

The Contractor shall be responsible for the acts of its agents, superintendents, and employees during the life of the Contract.

GP-7.04. CONTRACTOR'S EMPLOYEES

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

GP-7.05. CONTRACTOR'S RESPONSIBILITY AND LIABILITY FOR INJURIES TO PERSONS OR DAMAGE TO PROPERTY

The Contractor shall be solely responsible and liable for the safety and protection of property, including but not limited to, the premises, its appurtenances and equipment and for the safety and protection of all persons entering on, in or about the Site including, but not limited to, the employees of the Owner, Engineer, Contractor, or subcontractors. The Contractor shall be solely responsible for all physical injuries, including death, to any such persons and for all damage to any such property occurring on account of the Work under this Contract, whether or not due to the negligence, fault, or default of the Contractor, its officers, employees, or agents, or of a subcontractor, its officers, employees, or agents.

To the fullest extent permitted by the law of the State in which the work is performed the liability of the Contractor under this Contract shall be absolute and shall not be dependent upon any question of negligence on the Contractor's part or on the part of its officers, agents, servants, or employees. Neither the approval by the Engineer of the methods of doing the Work, nor the failure of the Engineer to call attention to improper or inadequate methods or to require a change in methods, nor the neglect of the Engineer to direct the Contractor to take any particular precautions or to refrain from doing any particular thing shall excuse the Contractor from its obligations hereunder in case of any such injury to person or damage to property.

The provisions of this paragraph are intended for the sole benefit and protection of the Owner and Engineer and shall not create any cause of action in favor of any person, corporation or entity, other than the Owner and Engineer.

GP-7.06. CONTRACTOR'S DUTY OF INDEMNIFICATION

The Contractor shall fully protect, defend, indemnify, and save harmless the Owner and the Engineer, their officers and agents, against all liability, judgments, costs, damages and expenses, including reasonable attorneys' fees, upon any claims for injuries to, or death of, any persons or damage to any property occurring on account of the Work hereunder, whether such damages or injuries to be attributable to the negligence of the Contractor, its officers, employees, agents, the Owner, Engineer, or others, provided, however, where such indemnification is precluded by statute, this clause shall not be deemed to provide indemnity to the Owner or Engineer to the extent that such liability, judgements, costs, damages and expenses are attributable to the negligence of the Owner or Engineer.

The Contractor shall fully protect, defend, indemnify, and save harmless the Owner and the Engineer against all liability judgments, costs, damages, and expenses, including without limitation reasonable attorneys' fees, upon all claims relating to labor and material furnished in connection with the Work hereunder or on account of the

failure, omission, or neglect of the Contractor or its Subcontractors, their officers, employees, or agents to do or perform any of the covenants, acts, matters, or other duties required by this Contract.

The provisions of this Section GP-7.06 shall not be deemed to provide indemnity of the Engineer for the liability of the Engineer, its agents or employees, to the extent that the liability of the Engineer, its agents or employees arises out of (a) or (b) below.

(a) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs, or specifications, or

(b) the negligent giving or failure to give, directions or instructions required by this contract or statute of the Engineer, its agents or employees as part of the Work, where such giving or failure to give directions or instructions, is the primary and principal cause of the bodily injury or property damage.

GP-7.07. CLAIMS

If the Contractor claims: 1) that any Work it has been ordered to do is extra work, or 2) that it has performed or is going to perform extra work, or 3) that any action or omission of the Owner or the Engineer is contrary to the terms and provisions of the Contract, it shall:

(a) Promptly comply with such order;

(b) File with the Owner and the Engineer within ten working days after being ordered to perform the Work claimed by it to be extra work or within ten working days after commencing performance of the extra work, whichever date shall be the earlier, or within ten working days after the said action or omission on the part of the Owner or the Engineer occurred, a written notice of the basis of its claim and a request for a determination thereof;

(c) File with the Owner and the Engineer, within thirty calendar days after said alleged extra work was required to be performed or said alleged extra work was commenced, whichever date shall be earlier, or said alleged action or omission by the Owner or the Engineer occurred, a verified detailed statement, with documentary evidence, for the items and basis of its claim;

(d) Produce for the Owner's examination, upon notice from the Owner, all of the Contractor's and its subcontractors' (of any tier) books of account, bills, invoices, payrolls, subcontracts, time books, progress records, daily reports, bank deposit books, bank statements, checkbooks, and canceled checks showing all of its actions and transactions in connection with, or relating to, or arising by reason of, its claim, and submit itself, persons in its employment, and persons in its subcontractor's employment for examination under oath by any person designated by the Owner to investigate any claims made against the Owner under the Contract, such examination to be made at the offices of the Owner or the Owner's agent;

(e) Proceed, prior to and subsequent to the determination of the Owner with respect to any such disputed matter, with the performance of the Contract diligently and in accordance with all instructions of the Owner and the Engineer.

The Contractor's failure to comply with any or all of the foregoing provisions of this Section shall be deemed to be: 1) a conclusive and binding determination on its part that said order, work, action, or omission does not involve extra work and is not contrary to the terms and provisions of the Contract; and 2) a waiver by the Contractor of all claims for additional compensation or damages as a result of said order, work, action or omission.

No person shall have power to waive or modify any of the foregoing provisions. In any action against the Owner to recover any sum in excess of the sum certified by the Owner to be due under or by reason of the Contract, the Contractor must allege in its complaint and prove at the trial compliance with each and all the provisions of this Section.

Nothing in this Section shall in any way affect the Owner's right to obtain an examination before trial or a discovery and inspection in any action that might be instituted by, or against, the Owner or the Contractor.

GP-7.08. NO CLAIMS AGAINST INDIVIDUALS

No claim whatsoever shall be made by the Contractor against any trustee, beneficiary, officer, agent, or employee of the Owner for, or on account of, anything done or omitted to be done in connection with the Contract.

This Section shall also apply with equal force and effect to the directors, officers and employees of the Engineer provided, however, that this Section shall not apply to partners or other persons who by law would be liable for the acts of the legal entity, whether the Owner or Engineer, it being the intent of this Section that claims against the legal entity itself shall not be precluded.

GP-7.09. SAFETY AND PROTECTION

In addition to the published safety rules and practices of the Owner, if any, applicable to activities at the Site the Contractor shall comply with all applicable laws, ordinances, rules, regulations, and orders of public bodies having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss, including, without limitation, the Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of l970 (PL 91-596), as amended, and under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54) and the Labor Laws of the State within which the project is located and the codes, rules and regulations promulgated therewith and all amendments or successor statutes or regulations to any of the foregoing. The Contractor shall erect and maintain as required by the conditions and the progress of the Work, all necessary safeguards for safety and protection and shall comply with all applicable recommendations of the Manual of Accident Prevention in Construction of the Associated General Contractors of America, Inc.

In compliance with the foregoing the Contractor shall have on site while any work is being performed an appropriately trained, responsible member of its organization whose duty shall be compliance with the above referenced laws, ordinances, rules, regulations and orders and the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated in advance in writing by the Contractor to the Owner.

The Contractor shall be responsible for developing, adopting and enforcing a project specific health and safety plan. The Contractor may not use any health and safety plan provided by Owner or Engineer as a substitute for conducting a full independent analysis of the materials, substances, equipment and conditions to be encountered during the project or as part of Contractor's work. The Contractor shall be responsible for determining and applying the most current applicable codes, rules, regulations and generally accepted standard of practice for each element of Contractor's health and safety plan. The Contractor shall not be permitted to rely on any project health and safety plan provided by Owner or Engineer.

The Contractor shall be responsible for providing to all its employees, agents and subcontractors or any other person under its control all safety equipment including but not limited to, hard hats, safety helmets, safety eye wear, respirators, and protective clothing required by law and the project specific health and safety plan, and shall be responsible for insuring the proper use thereof.

The Contractor shall place a post adjacent to the principal entry point into each excavation. Following each inspection of the excavation as required by 29 CFR 1926 (Subpart P) the Contractor shall prominently post in a manner protected from loss or damage by weather or other conditions, a certification of inspection. Such certification shall be 8 □" x 11" and shall be headed

"Excavation Safety Inspection"

and shall set forth in letters and figures at least 2 inches high and □ inch in thickness the time and date of the last inspection of the excavation. The certification shall also state that no evidence was found on inspection of: 1) a situation that could result in possible cave ins, 2) indication of failure of protective systems, 3) hazardous atmospheres, or 4) other hazardous conditions. The certification shall be signed by a competent person (as defined in 29 CFR 1926.650).

The duties, responsibilities and liability of the Contractor as set forth herein shall be deemed incorporated in and applicable to each and every separate division, section and provision of the Contract Documents as if set fort fully therein.

The Contractor shall keep upon the Site, at each location where Work is in progress, a completely equipped first-aid kit and stretcher and shall provide ready access thereto at all times when personnel are employed on the Work.

The Contractor alone shall be responsible for the safety, efficiency, and adequacy of his plant, appliances and methods.

GP-7.10. EMERGENCIES

In emergencies affecting the safety of persons on the Work or property at the Site or adjacent thereto, the Contractor, without special instruction or authorization from the Engineer or Owner, shall act, at its discretion, to prevent threatened damage, injury or loss. It shall give the Engineer prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused thereby. If the Contractor believes that additional Work done by it in an emergency which arose from causes beyond its control entitles it to an increase in the Contract price or an extension in the Contract time, it shall make claim as provided for in this Contract.

GP-7.11. PATENTS AND LICENSING AGREEMENTS

The Contractor shall protect, defend, indemnify, and save harmless the Owner and Engineer from all liabilities, judgments, costs, damages, and expenses which may in any way come against either of them by reason of the use of any material, machinery, devices, equipment, software or processes furnished or used in the performance of the Work for which patents or licensing agreements exist or by reason of the use of designs furnished by the Contractor for which patents or licensing agreements exist.

In the event that any claim, suit, or action at law or in equity of any kind whatsoever is made or brought against the Owner involving any such patents or licensing agreements, the Owner shall have the right to retain from the money due and to become due the Contractor a sufficient amount of money as shall be considered necessary by the Owner to protect itself against loss until such claim, suit, or action shall have been settled and evidence to that effect shall have been furnished to the satisfaction of the Owner.

GP-7.12. CONTRACTOR TO CHECK CONTRACT DOCUMENTS

The Contractor shall verify all dimensions and quantities in the Contract Documents. Any discrepancies found between the Contract Documents and Site conditions or any errors or omissions found shall be immediately reported to the Engineer, who shall promptly correct such error or omission in writing. Any Work done by the Contractor after its discovery of such discrepancies, errors, or omissions shall be done at the Contractor's sole risk and expense.

SECTION 8

SUBCONTRACTS AND ASSIGNMENTS

GP-8.01. ASSIGNMENT

The Contractor shall not assign, transfer, convey, or otherwise dispose of this Contract, or any portion thereof, or of its right, title, or interest therein, or its power to execute such Contract, to any other person or corporation without the previous consent in writing of the Owner.

The provisions of this Section shall not hinder, prevent, or affect an assignment by the Contractor for the benefit of creditors made pursuant to law, nor is it intended to prohibit subcontracting a portion of the Work of the Contract in accordance with the provisions of law and this Contract.

GP-8.02. SUBCONTRACTS

In the event that the Contractor desires to subcontract any part of the Work, it shall first submit to the Engineer a statement showing the character and amount of the Work to be subcontracted and the party to whom it is proposed to subcontract the same. Submission of said statement shall be 30 days prior to the time the Contractor plans to actually employ the proposed subcontractor. The Contractor shall also furnish a statement as to the proposed subcontractor's experience, financial ability, or other qualifications for properly performing the Work proposed to be subcontracted. In the event that the Owner or the Engineer objects for any reason to the Contractor contracting with a particular Subcontractor, the Owner or the Engineer shall provide the Contractor with notice of the same within ten (10) business days after submission by the Contractor to the Owner and the Engineer of the name and qualifications of such Subcontractor. The Contractor shall not contract with any such Subcontractor and shall promptly provide the Engineer with the name, experience, financial ability and other qualifications of a substitute Subcontractor.

The Contractor warrants that all subcontractors selected by it are financially able, sufficiently experienced, and otherwise qualified to perform the work of their subcontracts.

The Contractor shall be solely responsible for the acts or defaults of subcontractors and of such subcontractors' officers, agents and employees each of whom shall, for this purpose, be deemed to be the agent or employee of the Contractor to the extent of its subcontract.

The Contractor shall be fully responsible for the administration, integration, coordination, direction, safety practices and supervision of all of its subcontractors.

No subcontractor shall be permitted to work at the Site unless it furnishes and maintains the insurance required by this Contract. Certificates of Insurance shall be provided to the Owner, prior to admission of each subcontractor to the site.

The Contractor shall execute with each of its subcontractors and all subcontractors shall execute with their sub-subcontractors a written agreement which shall bind the latter to the terms and provisions of this Contract insofar as such terms and provisions are applicable. The Contractor and all subcontractors and sub-subcontractors shall promptly, upon request, file with the Owner a conformed copy of such agreements, from which the price and terms of payment may be deleted.

If, at any time during the progress of the Work to be performed, the Owner decides that any subcontractor of any tier is incompetent, careless or uncooperative, the Engineer as directed by the Owner will notify the Contractor accordingly and immediate steps will be taken by the Contractor for cancellation of such subcontract. Such termination, however, shall not give rise to any claim by the Contractor or by such subcontractor for loss of prospective profits on work unperformed or work unfinished, and a provision to that effect shall be contained in all subcontracts.

No provisions of this Contract shall create or be construed as creating any contractual relation between the Owner and any subcontractor or sub-subcontractor or with any person, firm or corporation employed by, contracted with or whose services are utilized by the Contractor.

The divisions or sections of the Contract Documents are not intended to control the Contractor in dividing the work among subcontractors or to limit the work performed by any trade.

The Owner reserves the right to limit the total amount of subcontracts to fifty percent (50%) of the total contract price.

SECTION 9

CHANGES

GP-9.01. OWNER'S CHANGES IN THE WORK

(a) The Owner at any time may make changes in the Work of the Contract by making alterations therein, by making additions thereto, or by omitting Work therefrom, and no such action shall invalidate the Contract, relieve or release the Contractor from any guarantee under the Contract, affect the terms or validity of any bond, relieve or release any Surety, or constitute grounds for any claim by the Contractor for damages or loss of anticipated profits. If changes in work exceed 20% of the Contract, notice must be given to Surety. All Work required by such alterations, additions, or omissions shall be executed under the terms of the Contract not withstanding the extent thereof. Said changes alterations, additions or omissions shall not constitute a cardinal change in the Contract.

(b) Other than in an emergency endangering life or property or pursuant to a Field Order, the Contractor shall not make any change in the Work nor furnish any labor, equipment, materials, supplies, or other services in connection with any change except pursuant to, and after, receipt of a written authorization from the Owner in the form of a Change Order, Modification, or Proceed Order. The Contractor shall not be entitled to any increase in the Contract price or extension of the Contract time, and no claim therefor shall be valid, unless such written authorization has been so issued to the Contractor, by the Owner.

(c) The Engineer may authorize minor changes in the Work which do not alter the character, quantity, or cost of the Work as a whole. These changes may be accomplished by a Field Order. The Contractor shall carry out such Field Orders promptly and without any adjustment of the Contract price or Contract time.

GP-9.02. ADJUSTMENTS IN PRICE

Any increase or decrease in the Contract price resulting from changes in the Work ordered by the Owner shall be determined as provided in this Section:

(a) By such applicable unit prices, if any, as set forth in the Contract; or

(b) If no such unit prices are so set forth, then by unit prices or by a lump sum mutually agreed upon by the Owner and the Contractor; such unit prices or lump sum being arrived at by estimates of reasonable value prepared in general conformance with the outline set forth in (c) below.

(c) If no such unit prices are so set forth and if the parties cannot agree upon unit prices or a lump sum, then determination shall be made as the sum of the following amounts for all Work necessary for the changes:

(1) Cost of materials delivered to the job Site for incorporation into the Contract Work.

(2) Wages paid to workmen and foremen and wage supplements paid to labor organizations in accordance with current labor agreements.

(3) Premiums or taxes paid by the Contractor for workmen's compensation insurance, unemployment insurance, FICA tax and other payroll taxes as required by law.

(4) Sales and use taxes paid as required by law.

(5) Allowances for necessary use of construction equipment (exclusive of hand tools and minor equipment), as approved by the Engineer.

(6) An amount for overhead.

(7) An amount for profit.

Construction equipment rental rates shall be in accordance with those published in that issue of the Associated Equipment Distributors (AED) Rental Guide, current at the time the work is done. In the event that rental rates for equipment used in the performance of extra work are not listed in the AED Rental Guide, rental rates will be approved for payment which are consistent with those prevailing in the construction industry in the area of the Work. Monthly, weekly, or daily rates shall apply, prorated to the actual time the equipment is in use; the classification of monthly, weekly, or daily rate to be used shall be determined by the length of time the piece of equipment under consideration was in use on the total project under Contract plus either the time used in the performance of the extra work or the time used in the performance of the extra work plus additional subsequent time used on the total project under contract. Gasoline, oil and grease required for operation and maintenance will be paid for at the actual cost. When, in the opinion of the Contractor as approved by the Engineer, suitable equipment is not available on the Site, the moving of said equipment to and from the Site will be paid for at actual cost.

The Contractor shall submit evidence satisfactory to the Engineer to substantiate each and every item included in an estimate prepared pursuant to GP-9.02 (b) or a determination pursuant to GP-9.02 (c).

The amounts allowed for overhead and profit for a change resulting in an increase in Contract price may be less than, but shall not exceed, the applicable percentages as follows:

(a) For work done directly by the Contractor, the sum of overhead amount plus profit amount shall not exceed 20% of the cost.

(b) For work done by subcontractors of any tier, the sum of total overhead amounts of the subcontractors and Contractor, plus total profit amounts for the subcontractors and Contractor, shall not exceed 25% of the cost. Subcontractors shall be limited to 15% and Contractors shall be limited to 10% for combined overhead and profit.

Overhead is defined as all expense not included in the amounts outlined in GP-9.02 (c) (1) through GP-9.02 (c) (5), including administration, superintendence, insurance not outlined in GP-9.02 (c) (1) through GP-9.02 (c) (5), material used in temporary structures, additional premiums placed upon the labor and performance bonds of the Contractor and small hand tools.

Where Work necessitated by the change involves overtime, no payroll taxes, overhead or profit will be allowed on the premium portion of overtime pay.

GP-9.03. PROCEED ORDER

If the Owner and the Contractor cannot agree upon an equitable adjustment of the Contract price prior to performance of the change in the Work, a Proceed Order will be issued authorizing the change, and Contractor shall proceed with the work thereof by the most economical methods. Upon completion of the change in the work and a determination of the adjustment in the Contract price, a Change Order will be issued.

GP-9.04. EXTRAS BY CONTRACTOR

Extras for Increase in Contract Price: If the Contractor claims that any instructions given to him by the Owner or Engineer, by the drawings or otherwise, involve extra Work not covered by the Contract, then, except in emergencies endangering life or property, the Contractor shall give the Owner written notice thereof before proceeding to execute the Work. Said notice shall be given promptly enough to avoid delaying the Work and in no instance later than 10 days after the receipt of such instructions. Should it not be clear to the Contractor that a change will involve extra Work, written notice given within 10 days that the change may involve extra Work will be considered sufficient notice. If the Owner agrees that the Work involved in such instruction was extra work, a change order shall be issued as provided in GP 9.02 of these General Provisions, and the additional compensation to be paid therefore shall be determined by one of the three methods provided in said GP 9.02, selected by the Owner. Except as otherwise specifically provided, no claims for extra Work shall be allowed unless the notice required by this Section is given by the Contractor within the time allowed and unless such Work is performed pursuant to the written order of the Owner as provided in said GP 9.02. The Owner's written order shall designate which of the three methods for computing charges and credits set forth in GP 9.02.

SECTION 10

CORRECTION AND GUARANTEE OF WORK

GP-10.01. CORRECTION OF WORK PRIOR TO ACCEPTANCE

If the Work, or any portion thereof, is damaged or defective in any way or if defects not readily detected by inspection develop before acceptance of the Work, the Contractor shall forthwith remove and replace, without additional compensation, such damaged or defective work. This requirement to remove and replace is notwithstanding that the Work may have previously passed the prescribed inspections and tests.

If the Contractor shall fail to replace any defective or damaged work within thirty days following written notice from the Engineer, or such other period of time designated by written notice from the Engineer, the Owner may cause such Work, material or equipment to be replaced; the expense thereof shall be charged to the Contractor and the amount deducted from any monies due or to become due the Contractor.

Any materials brought upon the Site which shall be rejected by the Engineer as not in conformity with the Contract Documents shall be removed immediately by the Contractor from the Site of the Work and replaced with materials complying with the Contract Documents without any additional costs or expense to the Owner.

Failure or omission on the part of the Engineer or any of its assistants or agents to reject defective or inferior work, material, or equipment, shall not release the Contractor from the obligations of tearing out, removing, and properly replacing the defective or inferior Work, materials, or equipment at Contractor's sole cost and expense at any time, upon the discovery of said defective or inferior work, material or equipment, prior to the written acceptance of the Work under this Contract, notwithstanding that such Work, material, or equipment may have been estimated for payment or that partial payments have been made on the same.

GP-10.02. CORRECTION OF WORK AFTER ACCEPTANCE

Any Work requiring rebuilding or replacement, as set forth in the subsection entitled "Guarantee", will be brought to the attention of the Contractor by written notice. The Contractor shall, within five days of such written notice, advise the Owner of his schedule for the timely rebuilding or replacement of such Work. Thereafter, such rebuilding or replacement shall be accomplished in accordance with said schedule.

GP-10.03. ACCEPTANCE OF UNCORRECTED WORK

If, instead of requiring correction or removal and replacement of Work which deviates from the Contract, the Owner may choose to accept it. In such case, a Change Order shall be issued with appropriate reduction in the Contract price as set forth in General Provisions Section entitled Deductions for Uncorrected Work.

GP-10.04. GUARANTEE

The Contractor guarantees the Work under the Contract against any and all defects in workmanship and materials for a period of one year following the date of Substantial Completion of the Work or the date of Beneficial Occupancy of that portion of the completed Work where Beneficial Occupancy may have occurred whichever shall later occur. Specific items of work and/or equipment may require extended warranty (beyond one year), the duration and terms of which shall be as specified in the Technical Specifications.

Pursuant to this guarantee, the Contractor agrees to make good, without delay and at its expense, any and all failures of any parts due to faulty materials, construction, or installation, or to the failure of any equipment to perform successfully within the limits prescribed by the Specifications; in addition, the Contractor shall make good any damage or injury to any other part of the Work caused by such failure of parts or equipment (Guarantee Work). Notwithstanding this provision, Owner may elect to apply the provisions of Sections 10.03 "Acceptance of Uncorrected Work" and 11.09 "Deduction for Uncorrected Work" to Guarantee Work.

Where the total value of all replacement or rebuilding required during the guarantee period is equal to or less than $5,000 or such other value as may be stated in the Special Provisions, the guarantee period shall terminate at one year following the later to occur of the date of Substantial Completion or Beneficial Occupancy. Where the total value of said replacement exceeds $5,000 or such other value as may be stated in the Special Provisions, the guarantee period for the total replacement or rebuilding shall be extended to a date one year following the date of completion of the rebuilding or replacing of the last item which failed.

The guarantee period for minor items contained on the Estimate of Work Remaining shall terminate at a date one year following the date of Substantial Completion, provided that completion or correction by the Contractor occurs within 6 months of the date of Substantial Completion. However, in the event of failure of a minor item or items following completion or correction of said minor items, the value of subsequent replacement or rebuilding of such item or items shall be included in the total value of all replacement or rebuilding for determining an extension of the guarantee period as set forth in the previous paragraph.

The Contractor shall furnish such labor and equipment as the Engineer may require to facilitate any one-year inspections of the Project at such times as shall be determined by the Engineer or Owner.

The guarantee under this provision shall not impair or limit the other rights and remedies available to the Owner by contract, statute or common law.

SECTION 11

PAYMENTS AND COMPLETION

GP-11.01. ESTIMATED QUANTITIES

The Contractor agrees: 1) that it will make no claim of any nature against the Owner or Engineer because of a difference between the quantities for unit price items of Work actually furnished and the estimated quantities stated in the Bid even though the estimated quantities prove grossly different from the quantities actually used, and 2) that the quantity of any unit price item of Work may be increased or decreased as may be deemed necessary without alteration or modification of the Contract.

In the event that the quantities of various items actually used are either higher or lower than the quantities stated in the Bid, the Contractor agrees as follows:

(a) where the change in quantities for any item in the original bid does not exceed 15% of the original bid quantity, the applicable unit prices bid shall be the sole basis for computing payment.

(b) where the change in quantities for any item in the original bid exceeds 15% of the original bid quantity, the Owner may review the unit price for said item to determine if a new unit price should be negotiated.

GP-11.02. PRICES

The prices herein agreed to for the performance of the Work shown and as specified shall include not only the doing of the Work but also the furnishing of all labor, tools, and materials therefor, whether the same are required directly or indirectly, unless otherwise specified.

Where Work is to be measured for payment by units of length, area, volume, or weight (as stated in the Bid), only the net amount of Work actually done, as it shall appear in the finished Work and as measured only within the payment limits described in the Contract Documents or as is ordered, shall be paid for, local customs to the contrary notwithstanding.

Where a lump sum price is bid for an item in the Bid, the lump sum price shall be for the Work complete as described in the item and shall include the cost of all specified or implied equipment, materials, and labor incidental to the Work, complete and ready for service and in accordance with the Contract Documents.

GP-11.03. BREAKDOWN OF LUMP SUM ITEMS

At least ten days prior to the submission of its first application for a progress payment, the Contractor shall present to the Engineer for its review a detailed schedule showing the breakdown of all lump sum bid prices in the Contract. Such schedule shall contain the amount estimated for each part of the Work and an estimate of quantities for each part of the Work. Work to be performed by subcontractors shall be separately identified. Upon request of the Engineer, said schedule shall be apportioned by the Contractor for labor and for materials. Such schedule shall be revised by the Contractor until the same shall be satisfactory to the Engineer and shall not be changed after the Engineer has approved the same without the express written consent of the Engineer. The approved schedule will be used in the preparation of the current estimate but will not be considered as fixing the basis for additions to or deductions from the Contract.

GP-11.04. CURRENT ESTIMATES

The Owner will establish dates during the respective months of the Project on which the Owner will accept applications for payment.

At least ten days before each date set for consideration for payment, the Contractor shall submit to the Engineer for review an application for payment, filled out and signed by the Contractor and covering the Work

completed as of the date of the application, in satisfactory form and supported by such data as the Owner and Engineer may reasonably require.

The Engineer will, within ten days after receipt of each application for payment, either indicate in writing its recommendation of payment and present the application to the Owner or return the application to the Contractor, indicating in writing his reasons for not recommending payment. In the latter case, the Contractor shall make the necessary corrections and resubmit the application.

The Engineer's recommendation of any payment request shall constitute its advice to the Owner: that to the best of its knowledge, information, and belief, based on the Engineer's on-site observations of the Work in progress and on its reliance upon application for payment and supporting data, the Work has progressed to the point indicated; that the quality of the Work appears to be in substantial compliance with the Contract Documents (subject to any subsequent tests and qualifications stated in his final review); and that the Contractor is entitled to the payment of the amount recommended. However, by recommending any such payment, the Engineer shall not thereby be deemed to have represented that it made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, that it has reviewed the means, methods, techniques and sequences, or that it has made any examination to ascertain how or for what purpose the Contractor has used the monies paid or to be paid to the Contractor on account of the Contract price.

Where Work has been included in the current estimate recommended by the Engineer for payment, and where such Work is later found to be defective, and where such defective Work has not been corrected, the Engineer will recommend to the Owner that the value of such uncorrected Work be deducted from the amount due or to become due the Contractor.

The Engineer may decline to act upon requests for monthly payment if lists of vendors and subcontractors, shop drawings, samples, work schedules, instruction manuals, and breakdowns of lump sum bid items necessary for orderly prosecution of the Work, are not submitted as required.

GP-11.05. TITLE TO MATERIALS, EQUIPMENT AND SUPPLIES

The Contractor warrants and guarantees that it will have good title to all materials, equipment, and supplies delivered to the Site for use in the Work.

Title to all materials, equipment and supplies to be sold by the Contractor to the Owner pursuant to this Contract or to be installed or incorporated into the Project shall immediately vest in the Owner upon delivery of such materials, equipment and supplies to the Site and prior to their installation or incorporation into the Project. Such materials, equipment, and supplies shall then become the sole property of the Owner subject to the right of the Owner to reject the same as hereinafter provided. The Contractor shall mark or otherwise identify all such materials, equipment, and supplies as the property of the Owner. The Contractor, at the request of the Owner, shall furnish to the Owner such confirmatory bills of sale and other instruments as may be required by it, properly executed, acknowledged, and delivered, confirming to the Owner title to such materials, equipment, and supplies free of liens or encumbrances of any kind. In the event that, after title has passed to the Owner, any of such materials, equipment, and supplies are rejected as being defective or otherwise unsatisfactory, title to all such materials, equipment, and supplies shall upon such rejection re-vest in the Contractor, and the Contractor shall then replace the rejected material, equipment, and supplies with acceptable material, equipment, and supplies at no additional cost to the Owner.

Nothing in this Section is intended, or shall be construed, as relieving the Contractor from its obligations under this Contract, and the Contractor shall have the sole continuing responsibility to install the materials, equipment, and supplies purchased or furnished in accordance with the provisions of this Contract, to protect the same, to maintain them in proper condition, and to forthwith repair, replace, and make good any damage thereto or loss thereof, without cost to the Owner until such time as the Work covered by the Contract is accepted by the Owner in accordance with Section GP-11.13.

The Contractor warrants and guarantees that no materials, equipment, or supplies delivered to the Site for use in the Work will have been acquired by the Contractor (or any other person performing work at the Site or

furnishing materials, equipment or supplies for the project) subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller (or otherwise imposed on the Contractor by any person).

GP-11.06. PAYMENTS FOR MATERIALS DELIVERED TO SITE

In making estimates of the value of the Work done and materials incorporated in the Work, the Contractor may, subject to the approval of the Owner or as required by law, include in the current estimates the delivered cost, as modified below, of equipment and non-perishable materials which have been tested for adequacy and which have been delivered to the Site and adequately protected from fire, theft, vandalism, the effect of the elements, and any damage whatsoever, or similarly placed in approved storage facilities adjacent thereto. Such materials and equipment shall at all times be available for inspection by the Engineer and the Owner.

No progress payment shall, however, be made for said material and equipment until each of the following conditions has been fulfilled:

(a) The Contractor shall have furnished to the Engineer invoices establishing the value of the said materials and equipment with the full amount the Contractor agrees to pay the vendor. Such invoices shall be furnished at least ten days in advance of the date of preparation of monthly estimates as established by the Engineer.

(b) The Engineer shall have inspected said material and equipment and recommended payment therefor.

(c) The Contractor shall have furnished to the Owner the fire and other casualty insurance policies, as provided in this Contract and with the broad form extended coverage endorsement, for said material and equipment in an amount equal to 100% of the value thereof and which policies shall be maintained, at the sole cost and expense of the Contractor, until said material and equipment has been incorporated into the Project and which shall name the Owner as an additional insured and loss payee and shall also name the Engineer as additional insured.

Contractor shall submit with each application for payment, satisfactory evidence that all suppliers, materialmen and subcontractors have been paid all amounts previously invoiced with respect to their services and agreeing to defend and hold Owner harmless from any liens and encumbrances placed against the Project on account of Contractor's failure to promptly pay its suppliers, materialmen and subcontractors. Satisfactory evidence shall be: a canceled check in the correct amount and including identification of the invoice or invoices paid; a letter or telegram, from the vendor and signed by his properly authorized employee, stating the amounts and invoices that have been paid; or a receipted invoice. Neither the Owner nor the Engineer shall have an obligation to pay or see to the payment of money to a Subcontractor except as may otherwise be required by law.

Should the above evidence of payment not be furnished, the Engineer will recommend the deduction of any funds included in previous estimates for such materials and equipment for which said evidence has not been furnished from the current estimate or subsequent current estimates.

Any payment made for materials and equipment delivered will not relieve the Contractor of any responsibility for furnishing all the necessary equipment and materials required for prosecution of the Work in the same manner as if such payments had not been made.

GP-11.07. OWNER'S PAYMENT OF MONTHLY ESTIMATES

The Owner will, within thirty days of presentation to it of an approved application for payment (current estimate), pay the Contractor the approved amount of such estimate, which unless otherwise set forth in the special provisions, shall be less retainage of ten (10) percent.

In lieu of all or part of the cash retainage, the Owner may accept securities negotiable without recourse, conditions or restrictions, a release of retainage bond, or an irrevocable letter of credit provided by the Contractor. The Owner may accept only securities, bonds or instruments acceptable under the laws of the State where the Owner is resident and/or the work is performed in lieu of any or all of the cash retainage.

Acceptance by the Contractor of the monthly payment shall constitute its warranty that it will pay each of its subcontractors and vendors all monies due them as required by applicable State and Federal Laws and Regulations.

GP-11.08. OWNER'S RIGHT TO WITHHOLD PAYMENTS

The Owner may withhold from the Contractor so much of any approved payments due it as may in the judgment of the Owner be necessary to assure the payment of any claims, liens or judgments against the Contractor, resulting from performance or non performance of the Work of the Contract, which have not been suitably discharged. The Owner shall have the right as agent for the Contractor to apply any such amounts so withheld in such manner as the Owner may deem proper to satisfy such claims, liens or judgments. Such application of such money shall be deemed payments for the account of the Contractor.

The Owner may also withhold from the Contractor so much an amount of any payments due it as may in the judgment of the Owner be necessary:

(a) to protect the Owner from loss due to previous payment for Work subsequently found to deviate from the Contract requirements and which has not been corrected by the Contractor, and

(b) to protect the Owner from loss due to previous payment for materials and/or equipment delivered to the Site for which evidence of payment to vendors has not been furnished by the Contractor.

GP-11.09. DEDUCTIONS FOR UNCORRECTED WORK

If the Owner deems it expedient to accept uncorrected Work, the Contract price shall be decreased by an amount, determined by the Owner, which is equal to the difference in value of the Work as performed by the Contractor and the value of the Work had it been satisfactorily performed in accordance with the Contract, or which is equal to the cost of performing the corrective Work, whichever shall be the higher amount.

GP-11.10. SUBSTANTIAL COMPLETION

The Work of the Contract shall be deemed Substantially Complete when either of the following occurs:

(a) When the Work of the Contract is at least 99% complete as evidenced by a list of minor items to be completed with estimated value equal to or less than 1% of the value of the Contract payments as shown in current estimates of Work completed.

(b) When the Owner and Contractor reach mutual written agreement that the Work is Substantially Complete.

The Contract will be considered as a single unit for determination of Substantial Completion except as follows:

(a) Where a division of major parts of the Contract is set forth in the Special Provisions for purposes of separate determinations of Substantial Completion for each part.

(b) Where the Owner and Contractor reach mutual written agreement that a major part of the Contract can be separately determined to be Substantially Complete.

(c) Where part of the Work of the Contract has been previously accepted into Beneficial Occupancy.

The date of Substantial Completion shall be evidenced by a Certificate of Substantial Completion signed by the Contractor, Engineer, and Owner.

GP-11.11. FINAL INSPECTION AND CERTIFICATE OF SUBSTANTIAL COMPLETION

The Owner, Engineer, and Contractor will make an inspection of the Work as soon as possible after written notification by the Contractor to the Owner that, in the judgment of the Contractor, the Work is 99% complete, or after the Owner and Contractor mutually agree that the Work appears Substantially Complete (the "Final Inspection"). Following said Final Inspection the Engineer will advise the Contractor of remaining items to be completed or corrected to arrive at completion of the Work inspected.

When the remaining items of Work to be completed or corrected are of sufficiently reduced value that Substantial Completion is indicated, the Engineer will prepare a detailed estimate (hereinafter referred to as Estimate of Work Remaining) of the value of said items showing each item's separate value as well as the total value of all items. The Contractor shall endorse said Estimate as evidence of agreement.

Substantial Completion will be evidenced by a Certificate of Substantial Completion signed by the Contractor, Engineer, and Owner. The date of Substantial Completion shall be that date specified in the Certificate of Substantial Completion. The Estimate of Work Remaining will be attached to the Certificate of Substantial Completion.

GP-11.12. PAYMENT AT SUBSTANTIAL COMPLETION

The Application for Payment at Substantial Completion shall be in a form satisfactory to the Owner and shall be accompanied by the following documents:

(a) Certificate of Substantial Completion with Estimate of Work Remaining attached.

(b) A schedule endorsed by the Contractor showing time of completion of all remaining Work.

(c) An affidavit of the Contractor: 1) that the claims of all subcontractors, materialmen, laborers, and all other persons and parties furnishing labor and materials with respect to the Contract have been paid in full except as noted; 2) that the Contractor will pay in full the exceptions stated from the proceeds of this payment; and 3) that the Contractor acknowledges that the Owner has made this payment in reliance upon this affidavit.

(d) Releases or receipts evidencing payment of all liens which may have been filed as a result of the performance of the Work of the Contract.

(e) A written statement from Surety that the Labor and Material Bond and the Performance Bond, each in the amount of 100% of the value of the Contract, are in force and will remain in force for a period of one year following the date of Substantial Completion or such later date as may be established by an extension of the guarantee period.

GP-11.13. ACCEPTANCE OF WORK

Acceptance by the Owner of the Work of the Contract will occur on the dates as follows:

(a) The date of Substantial Completion specified in the Certificate of Substantial Completion for all Work not included in (b) or (c) below.

(b) The date of Beneficial Occupancy for all Work taken into Beneficial Occupancy.

(c) The date of payment of the requisition of the Contractor at the time of 100% completion (correction for all Work included in the Estimate of Work Remaining).

GP-11.14. CONTRACTUAL RELEASE TO OWNER

The submission by the Contractor of an Application for Payment at Substantial Completion shall be, and shall operate as, a release to the Owner of all further claims and liability to the Contractor for all things done or

furnished in connection with the Contract, and for every act and neglect of the Owner and others relating or arising out of the Contract excepting the Contractor's requests for payment for completion or correction of Work items included in the Estimate of Work Remaining, the Application for Payment at Substantial Completion, and interest on said Payment if payment is improperly delayed. However, no Application for Payment, or payment of same, shall operate to release the Contractor from any obligations under the Contract or the Surety bonds.

GP-11.15. PAYMENT FOR MINOR ITEMS WHEN COMPLETED OR CORRECTED

The minor items of Work contained in the Estimate of Work Remaining shall be completed or corrected by the Contractor in a timely manner in accordance with the schedule submitted with the application for Payment at Substantial Completion. Upon such completion or correction, and upon Application for Payment in a form satisfactory to the Owner, the Owner will pay an amount equal to the value, and only that value, of the item or items of Work completed or corrected. The remaining amount held as determined when making Payment at Substantial Completion will be retained by the Owner until the Contractor has completed all items of Work contained in the Estimate of Work Remaining and has submitted evidence that all claims, liens, and judgments have been satisfied. No payment will be made which is less than one thousand dollars, except upon 100% completion or correction of all items included in the Estimate of Work Remaining.

GP-11.16. FINAL PAYMENT (Affidavit)

The Contractor's application for final payment (constituting the entire unpaid balance of the Contract sum) upon 100% completion (correction of all items included in the Estimate of Work Remaining) shall be accompanied by an affidavit of the Contractor ("Contractor Affidavit") as follows:

(a) That in accordance with the provisions of the applicable law of the State, in which the work is performed and other applicable State and Federal laws and regulations, all claims, liens, and judgments with respect to the Contract have been paid in full;

(b) that the Contractor has no further claims with regard to the Contract against the Owner or its agents; and

(c) that the Contractor acknowledges that the Owner has made this Final Payment in reliance upon this affidavit.

GP-11.17. OWNER'S RIGHT TO COMPLETE THE CONTRACT

During the time period extending from the date of Substantial Completion to a date six months thereafter or to mutually acceptable later date, the Contractor shall complete or correct all items contained in the Estimate of Work Remaining in accordance with the schedule established at Substantial Completion as such Estimate of Work Remaining and Schedule may be modified or supplemented prior to the end of the warranty period. Where Work items are not completed or corrected in accordance with the established schedule, and following reasonable notice by the Owner to the Contractor, the Owner may complete or correct said Work items. The cost for such completion or correction may be paid by the Owner, without review by the Contractor, and the Contractor shall reimburse the Owner for all costs so incurred.

It is hereby mutually agreed that six months following the date of Substantial Completion or the mutually acceptable later date, and at any time thereafter, the Owner (having given prior notice as set forth in the preceding paragraph) may, without additional notice to the Contractor, complete and correct any items contained in the Estimate of Work Remaining which are remaining to be completed or corrected. The cost for such completion and correction may be paid by the Owner, without review by the Contractor, and the Contractor shall reimburse the Owner for all costs so incurred. In the event that the Owner commences legal proceedings to recover all costs not reimbursed, there shall be included as an item of damage all reasonable attorneys' fees.

Any funds previously held by the Owner at the time of payment at Substantial Completion may be applied by the Owner to offset the costs incurred for completion or correction of items contained in the Estimate of Work Remaining. All costs incurred by the Owner in excess of funds previously held will be billed to the Contractor, and the Contractor shall promptly reimburse the Owner for said costs. The Owner may add reasonable amounts for

administrative, engineering, and supervisory services to the cost of construction for those items completed or corrected by the Owner. In the event that the Owner commences legal proceedings to recover all costs not reimbursed, there shall be included as an item of damage all reasonable attorneys' fees.

GP-11.18. BENEFICIAL OCCUPANCY

The Owner reserves the right to accept for Beneficial Occupancy any portion of the Work, whether or not Substantially Complete, at anytime without prejudice to the Owner in enforcing any provisions of the Contract.

Beneficial Occupancy by the Owner shall occur when the Owner accepts a part of the Work, but not all Work of the Contract, and places such accepted Work in the service therefor intended.

Upon Beneficial Occupancy by the Owner the following procedures will apply:

(a) The Engineer, with the approval of the Owner, will notify the Contractor as to what portion, or portions of the Work have been accepted into Beneficial Occupancy.

(b) The retained percentage for the completed Work taken into Beneficial Occupancy will be released.

(c) The guarantee period applicable to that portion of the Work accepted into Beneficial Occupancy will start as of the date of Beneficial Occupancy.

(d) As of the date of Beneficial Occupancy, the Owner will assume responsibility for maintenance, heat, utilities, and insurance on that portion of the Work accepted for occupancy.

(e) The Contractor shall subsequently complete or correct all unfinished items in the Work accepted by the Owner for Beneficial Occupancy.

(f) Such action by the Owner will in no way affect the obligations of the Contractor under the terms and provisions of the Contract with respect to uncompleted Work.

(g) Upon completion of unfinished items in the Work beneficially occupied, sufficient to establish Substantial Completion as defined herein, all procedures set forth herein for Work deemed Substantially Complete shall apply.

GP-11.19. CONTRACTOR'S AUTHORITY TO SIGN

All Current Estimates, applications for payment, affidavits, and other documents required hereunder and the Certificate of Substantial Completion, shall be signed on behalf of the Contractor by a person evidencing its authority to do so and shall be acknowledged where required in form satisfactory to the Owner.

GP-11.20. CHARGES FOR DELAY CAUSED BY THE CONTRACTOR

It is hereby agreed that time is of the essence of the Contract with respect to the Work to be performed and that the Owner will suffer damages from failure to complete the Work in the time specified. When the Work embraced in the Contract is not 100% Completed on or before the date specified herein or on or before the later date to which the time of 100% Completion may have been extended in writing by the Owner, the engineering and inspection expenses incurred by the Owner, upon the Work from said date to the date of 100% Completion of the Work shall be charged to the Contractor and be deducted by the Owner from monies due the Contractor, and in addition, the Contractor shall be charged the liquidated damages stated in the Contract for the same period, said sums being not in the nature of a penalty, but a part of the consideration of the Contract.

The Owner shall have the right to deduct such amounts from any monies due or to become due the Contractor and the amount still owing, if any, after such deduction shall be paid on demand by the Contractor or its Surety. Such payment shall not relieve the Contractor or its Surety from any other obligation under this Contract.

GP-11.21. DELAYS CAUSED BY OTHERS

If the Contractor is unreasonably delayed at any time in the progress of the Work by any act, omission, or neglect of the Owner or Engineer, its agents or employees which are beyond their control, or if the Contractor is delayed at any time in the progress of the Work by any act, omission or neglect of any separate contractor engaged by the Owner, or by strikes, fires, unusual delays in transportation, abnormal adverse weather conditions or unavoidable casualties not caused by the Contractor, or by any other cause beyond the Contractor's control, the time for Substantial Completion or 100% Completion, as applicable, shall be extended for the length of time that the substantial Completion or 100% Completion of the Work was actually delayed thereby and the Contractor shall not be charged with liquidated or actual damages for the delay during the period of such extension nor shall the Contractor be due compensation for extended general conditions expense, other expense related to the delay, overhead, or profit for the period covered by such extension. No extension shall be granted unless the Contractor demonstrates a delay in the Substantial Completion or 100% Completion of the Work, as applicable, by showing a delay on the critical path of the CPM schedule.

GP-11.22. OWNER'S RIGHT TO ACCELERATE

If the Owner or Owner's Representative elects to direct the Contractor to accelerate the work at no additional cost to the Owner to eliminate delays pursuant to GP 11.20, the Contractor shall immediately implement the acceleration. Acceleration can be in the form of additional manpower, overtime and/or additional shift work or a combination thereof. If the Contractor refuses to immediately proceed with the directed acceleration, the Owner may exercise its right to declare the Contractor in default as stipulated in GP 5.02.

SECTION 12

INSURANCE AND BONDS

GP-12.01. INSURANCE

The Contractor at its expense shall procure and shall maintain the insurance required in this section and elsewhere in this Contract to be provided by the Contractor. The Contractor shall require each subcontractor to procure and maintain the insurance required by this Contract to be provided by subcontractors.

The contractor shall procure (in addition to the coverage required in other sections of this Contract):

(a) Workers' Compensation and Disability Benefits with coverage to the statutory limits as required by the laws of the state in which the project is located in sufficient limits to discharge obligations under all applicable state Workers' Compensation laws, and, where applicable, the United States Longshoremen and Harbor Workers Act, the Jones Act and Admiralty or Maritime Law.

(b) Employers Liability Insurance, including occupational disease coverage, in the amount of at least $1,000,000.

(c) Commercial General Liability Insurance providing coverage for the Contractor for legal liability and customarily covered expenses for bodily injury and property damage with respect to the Work under this Contract, including but not limited to liability for bodily injury and property damage: 1) arising out of operations performed for the Contractor by independent contractors or arising out of acts or omissions of the Contractor in connection with its general supervision of such operations (Contractors' Protective Liability Insurance), 2) occurring after operations have been completed or abandoned (Completed Operations Insurance), 3) arising, after physical possession of the products has been relinquished, 4) out of the Contractor's products or reliance upon a representation or warranty with respect thereto (Products Liability Insurance), and5) assumed under this Contract (Contractual Liability Insurance). This policy shall include coverage for explosion, collapse and underground operations (XCU hazards) and shall provide coverage in the amount of at least $1,000,000 per Occurrence, $3,000,000 in the General Aggregate, and $3,000,000 in the Products Completed Aggregate. This policy shall contain a per Project Aggregate Endorsement.

(d) Comprehensive Automobile Liability insurance providing coverage for the Owner and the Contractor for legal liability (and customarily covered expenses) for bodily injury and property damage arising out of the ownership, maintenance, operation, use, loading, or unloading owned, nonowned and hired automobiles. The policy shall provide coverage in the amount of at least $1,000,000 Combined Single Limit, and shall include the MCS-90 Sudden and Accidental Pollution endorsement.

(e) Owners protective liability insurance providing coverage for the Owner as the named insured for legal liability (and customarily covered expenses) for bodily injury and property damage arising out of the operations under this Contract performed for the Owner by the Contractor or any of its subcontractors or out of acts or omissions of the Owner in connection with the Owner's general supervision of such operations. The policy shall provide coverage in the amount of at least $2,000,000 Per Occurrence and $2,000,000 in the Aggregate.

(f) The Contractor shall obtain and maintain Builders Risk/Installation Floater insurance in a form acceptable to the Owner upon the entire Project for the full cost of replacement at the time of any loss. This insurance shall include as named insureds the Owner, Contractor, Engineer, and Subcontractor of any tier. This insurance shall insure against loss from the perils of fire and extended coverage, and shall include "all risk" insurance for physical loss or damage including without duplication of coverage at least: theft, vandalism, malicious mischief, transit, collapse, false work, temporary buildings, debris removal, flood, earthquake, testing and damage resulting from defective design, workmanship or material. This insurance shall not be restricted, canceled

or lapsed for reasons of occupancy. The limits of the coverage shall be at least equal to the full contract amount for the project.

(g) Umbrella Coverage/Excess Liability Insurance providing coverage for the Owner and the Contractor for costs in excess of the limits set forth in paragraphs (b), (c) and (d) above. This policy shall provide coverage in the amount of at least $5,000,000 Per Occurrence and $5,000,000 in the Aggregate. Owner reserves the right to increase or decrease the minimum limits depending on the project value and complexity.

Owner and Engineer shall be named as additional insureds on policies (c), (d), (f) and (g).

Each subcontractor shall provide (in addition to the coverage required in other sections of this Contract):

(a) Comprehensive General Liability Insurance providing coverage for the subcontractor in the form as hereinabove required of the Contractor including Contractors Protective Liability Insurance, Completed Operations Insurance, Products Liability Insurance, and Contractual Liability Insurance.

(b) Comprehensive automobile liability insurance providing coverage for the subcontractor as hereinabove required of the Contractor.

Each policy of insurance required under the Contract whether for Contractor or Subcontractor shall be issued by an insurance company approved by the Owner, authorized to issue such policy in the State in which the Project is located, shall be in form and content satisfactory to the Owner and its attorney, with a minimum of A-Best Insurance rating and shall provide: 1) that the policy shall not be changed or canceled until the expiration of thirty days after written notice to the Owner and Contractor, and 2) that it shall be automatically renewed upon expiration and continued in force unless the Owner and Contractor are given-thirty day□s written notice to the contrary, 3) that Contractor□s insurance shall be primary to any other coverage of Owner or engineer and, 4) that the insurer has agreed to waive rights of subrogation as the Owner and Engineer.

No Work shall be commenced under the Contract until the Contractor has delivered to the Owner proof of issuance of all policies of insurance required by the Contract to be procured by the Contractor. Before commencing any Work under the Contract, each subcontractor shall deliver to the Owner proof of the issuance of all policies of insurance required to be provided by the subcontractor. Nothing herein shall limit or substitute for the liability of Contractor for the liabilities of its subcontractors in connection herewith. The Contractor and subcontractors shall deliver to the Owner duplicate originals of each policy in which the Owner is named insured, certificates of all other insurance in such number as the Owner may require, and such alternate or additional proof of coverage as the Owner demands. The Contractor and each subcontractor shall from time to time upon the demand of the Owner promptly deliver to the Owner such proof of insurance as the Owner may require.

In the event of the failure of the Contractor to furnish and maintain such Insurance, Owner shall have the right to take out and maintain such insurance for and in the name of the Contractor, and the Contractor agrees to pay the cost thereof and to furnish all necessary information to permit Owner to take out and maintain such insurance for the account of the Contractor. Compliance by the Contractor with the foregoing requirements to carry insurance and furnish certificates shall not relieve the Contractor from liability under any provision of this Contract.

All liability insurance required by this Contract shall be maintained in force during the term of this Contract and until the later of one year after the date of final acceptance or one year after the Contractor or any subcontractor performs any Work under the Contract.

GP-12.02. ALTERNATIVE OR ADDITIONAL INSURANCE

If required by the Owner, the Contractor and any subcontractor shall provide any other alternative or additional insurance coverage, with appropriate additions or deductions from the Contract price to be made pursuant to the provisions applicable to change orders.

GP-12.03. SECURITY FOR FAITHFUL PERFORMANCE

Simultaneously with his delivery of the executed Contract, the Contractor shall furnish, in form satisfactory to the Owner, a performance bond and a labor and material bond, each in an amount at least equal to 100% of the accepted Bid, as security for faithful performance of this Contract and for the payment of all persons performing labor on the Project under this Contract and furnishing materials in connection with this Contract. The Surety company on each bond shall be duly authorized to do business in the State in which the Project is located and shall be satisfactory to the Owner. Each bond shall remain in force during the guarantee period provided in this Contract. The cost of these bonds shall be paid by the Contractor and shall be included in the Bid submitted.

GP-12.04. ADDITIONAL SECURITY

If, at any time, the Owner shall be or become dissatisfied with any Surety or Sureties then upon the Surety bonds, or if for any other reason such bonds shall cease to be adequate security to the Owner, the Contractor shall within five days after notice from the Owner to do so, substitute an acceptable bond in such form and sum and signed by such other Sureties as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Contractor. No payments on current estimates shall be deemed due or shall be made until the new Sureties shall have qualified.

Payment at Substantial Completion will be an amount equal to the value of all of the Work of the Contract which has been declared Substantially Complete including the estimated value of the minor items to be completed or corrected less an amount equal to twice the total Estimate of Work Remaining, less an amount withheld to satisfy any outstanding claims, liens, or judgments, less any charges for delay, and less all prior payments to or for the account of the Contractor. All prior estimates and payments including those related to Change Orders, shall be subject to correction by the payment at Substantial Completion.

SECTION 13

MATERIALS AND EQUIPMENT

GP-13.01. QUALITY AND WORKMANSHIP

All items of equipment and materials of like type furnished under one Contract shall be the product of one manufacturer, unless otherwise specified.

All materials furnished or incorporated in the Work shall be new, unused, of the best quality, and especially adapted for the service required; whenever the characteristics of any material are not particularly specified, such material shall be utilized as is customary in first class work of a nature for which the material is employed.

All materials and workmanship shall be subject to inspection, examination, and tests by the Engineer and other representatives of the Owner at any and all times during manufacture or construction and at any and all places where such manufacture or construction are carried on.

The selection of bureaus, laboratories, and agencies for the inspection and tests of supplies, materials, and equipment shall be subject to the approval of the Engineer. Satisfactory documentary evidence that the material has passed the required inspection and tests shall be furnished to the Engineer by the Contractor prior to the incorporation of the material in the Work.

All laboratory and field testing shall be at the sole cost and expense of the Contractor unless specifically stated otherwise in the Contract Documents.

GP-13.02. EQUIVALENT PRODUCTS AND CHANGES TO SPECIFICATIONS

The words "similar and equal to," "or equal," "equivalent," and such other words of similar content and meaning (hereinafter, "or equal") shall, for the purposes of this Contract, be deemed to mean similar and equivalent to one of the named products.

Whenever any product is specified in the Contract Documents by a reference to the name, trade name, make or catalog number of any manufacturer or supplier, the intent shall not be to limit competition, but to establish a standard of quality which the Engineer has determined is necessary for the project. If any product other than that specified is proposed for use by the Contractor, it shall submit to the Engineer either its certification that the "or equal" strictly conforms to the Specifications, or a statement specifically identifying all differences between the "or equal" and the Specifications. Any variation of a proposed "or equal" from the Specifications which is not specifically noted in the Shop Drawing or Contractor's submittal shall be at the sole risk and expense of Contractor. Engineer's review and stamping of Shop Drawings or Contractor submittals shall not be deemed to be, or constitute Engineer's acceptance of any such "or equals" or deviation from the Specifications which are not specifically noted on Contractor's submittal. In addition Contractor shall provide all the information that the Engineer requests concerning the product. The proposed product shall not be used until it is accepted by the Engineer. Any "or equal" incorporated into the Work without Engineer's written acceptance shall be at the Contractor's sole risk, and Engineer may require the removal and replacement of any unaccepted "or equal".

In all cases, the Engineer will be the sole judge as to whether a proposed "or equal" is acceptable, and the Contractor shall have the burden of proving, at its expense, to the satisfaction of the Engineer that the proposed "or equal" is similar and equal to the named product. In making such determination the Engineer may establish such criteria as it deems proper for acceptance of the "or equal".

Any requested change in the Specifications not pertaining to an "or equal" must be submitted to Engineer in writing and must be stated with sufficient clarity and detail to permit proper consideration by Engineer. Unless accepted by Engineer after submission as herein provided, any deviation from the Specifications, or the use of any product which varies from the Specifications, shall be at Contractor's sole risk and expense.

With respect to the acceptance or rejection of "or equals" by Engineer, neither the review and stamping of Shop Drawings and/or Contractor submittals as provided in Section GP-14.05, nor Engineer's failure to observe and note any variation from the Specifications (unless such variation is specifically noted and identified in Contractor's Submittal), shall reduce, transfer, or modify Contractor's responsibility to provide products which fully comply with the Specifications.

"Or equals" or changes to Specifications proposed by Contractor, which are judged by the Engineer to represent no-cost improvements or enhancements to the design, shall be reviewed without cost to Contractor. All other submissions of "or equals" or changes to the Specifications shall be considered after review of specific products submitted at the same time or earlier, and regardless of whether such "or equals" are accepted or rejected, Contractor shall reimburse Owner for the costs (including labor costs) and expenses of Engineer incurred in the review of "or equals" or changes to the Specifications, including the cost of Engineer's conflict review, and any revisions made as a result of such review, plus a 10% administrative charge. Contractor shall reimburse Owner for such sums upon demand.

Where the Engineer accepts an "or equal" by the Contractor and such "or equal" requires a revision or redesign of any part of the Work covered by the Contract, all such revision and redesign and all new drawings and details required therefor shall be acceptable to the Engineer and shall be provided by the Contractor at its expense. If an acceptable substitution of an "or equal" requires a different quantity or arrangement of duct work, piping, wiring, or any part of the Work from that in the Contract Documents, the Contractor shall provide the same at its expense.

GP-13.03. SUPPLIERS

All supplies and equipment shall be furnished by manufacturers who shall have at least three years' experience in the design, production, assembly, and field service of equipment of like type, size, and capacity. Where required by the Engineer, the Contractor shall supply a list of at least three successful installations.

GP-13.04. TOOLS, ACCESSORIES AND SPARE PARTS

The Contractor shall, unless otherwise stated, furnish with each type, kind, and size of equipment, one complete set of any special tools and appliances which may be needed to adjust, operate, maintain, or repair the equipment.

Each piece of equipment shall be provided with a substantial nameplate, which is securely fastened in place and clearly inscribed with the manufacturer's name, year of manufacture, and principal rating data.

Where the Technical Specification Sections of this Contract require spare parts to be furnished by the Contractor, said spare parts for each item of equipment shall be kept separate and tagged to identify the specific item of equipment to which they belong, shall be packaged so as to preclude damage from handling and storage, and shall be bagged or packaged together where items are small in dimension.

GP-13.05. EQUIPMENT INSTALLATION

The Contractor shall have on hand sufficient proper equipment and machinery of ample capacity to facilitate the Work.

The General Contractor shall furnish, install, and protect all necessary concrete pads, which shall include guides, track rails, bearing plates, anchor and attachment bolts, and all other appurtenances needed for the installation of the devices included in the equipment specified. The location, size and templates for the concrete pads shall be furnished by the Contractor supplying the equipment along with all guides, track rails, bearing plates, anchor and attachment bolts and other appurtenances required.

Anchor bolts shall be made of ample size and strength for the purpose intended. Unless otherwise specified, anchor bolts in submerged locations shall be bronze or stainless steel; all other anchor bolts shall be cadmium plated. Substantial templates and working drawings for installation shall be furnished.

All equipment shall be correctly aligned, leveled and adjusted for satisfactory operation and shall be installed so that proper and necessary connections can be made readily between the various units.

The Contractor shall furnish all oils and greases for initial operation of each item of equipment and shall furnish the lubricant chart as indicated in Paragraph GP-13.08. Insofar as possible, all lubricants shall be obtained from one manufacturer approved by the Owner. Each item of equipment shall be tagged to show the date lubricated, the name and type of lubricant used and the recommended frequency of lubrication.

All mechanical and electrical equipment shall be checked for correctness of installation by a qualified representative of the manufacturer, and the manufacturer shall certify in writing to the Engineer that the equipment was installed according to its specifications. Where multiple manufacturers have supplied components for a piece of equipment, the manufacturer that assembled the components shall supply the certification.

GP-13.06. OPERATING INSTRUCTIONS AND MANUALS

The Contractor shall furnish the services of qualified manufacturers' technicians to instruct designated employees of the Owner in the operation and care of all equipment. The Contractor shall also furnish and deliver to the Engineer three complete sets of instructions, bulletins; diagrams, and other data and information required for the proper operation and maintenance of the equipment, including spare parts lists and ordering of spare parts. These operating manuals shall be furnished to the Engineer at such time as the equipment is delivered and shall include references to models and serial numbers of equipment furnished, assembly drawings, lubrication instructions, and service recommendations. Such data shall be bound in booklet form for easy reference and shall be accompanied by a transmittal sheet listing an inventory of items included.

GP-13.07. STORAGE AND MAINTENANCE OF EQUIPMENT

Equipment containing moving parts or bearings which is subject to damage by exposure or improper storage shall be protected as set forth herein:

The Contractor shall require that the manufacturers of all equipment to be incorporated into the Work of this Contract supply detailed instructions concerning storage and maintenance required to maintain the equipment in good condition until it is placed in operation. These instructions shall be acceptable to the Engineer and shall be strictly enforced. Such acceptance shall not relieve the Contractor of its obligation to properly store and maintain the equipment.

Equipment which is intended for outdoor installation may be stored outside subject to and in accordance with the manufacturer's instructions. Equipment intended for indoor installation shall be stored in heated and ventilated warehouses or in heated and ventilated enclosures on the Site of the Work.

Equipment which is installed more than seven days prior to being placed in operation shall be protected in strict accordance with the manufacturers' recommendations and in a manner acceptable to the Engineer. Such protection, where dictated, shall consist of complete air-tight encapsulation with desiccants.

Equipment improperly stored or improperly protected after installation shall, at the Owner's option, be replaced by the Contractor at no cost to the Owner.

GP-13.08. LUBRICATION CHART AND LUBRICATION

The Contractor shall furnish the Owner a lubrication chart(s) for all equipment furnished or installed by the Contractor. The chart(s) shall include the following for each item of equipment:

- name of the item;
- location of the item;
- each point of lubrication on the item;

- for each point of lubrication, the identification of the lubricant recommended and the recommended frequency of lubrication.

The information on the chart(s) shall be developed from manufacturers' printed data or from manufacturers' specific recommendations.

The identification of the lubricant by manufacturer's name and product identification number (such as Mobil X421) shall be furnished. Unless otherwise stated the name of the manufacturer to be used will be furnished to the Owner by the Contractor.

Following the initial operation of the equipment the Contractor shall relubricate, changing and adding lubricants, at the intervals or frequency as recommended by the manufacturer until acceptance.

SECTION 14

SHOP DRAWINGS AND SAMPLES

GP-14.01. LISTING OF ITEMS

Following execution of the Contract by the Contractor, the Engineer will submit to the Contractor a list of equipment, materials, and other items for which shop drawings, layouts, or samples will be required. This listing shall not be construed to be all-inclusive and may be added to, or deleted from, as may be required in the opinion of the Engineer.

GP-14.02. ACCEPTANCE OF MANUFACTURERS OR VENDORS

The Contractor, with such promptness and in such sequence as to cause no delay in the Work, shall submit to the Engineer the name of the manufacturer or vendor for each item on the list or addition to the list submitted. The Contractor shall make no awards, and no work under any item shall proceed, until acceptance of the manufacturer or the Engineer has given vendor. Such acceptance will be only on the basis of the manufacturer's or vendor's experience and reputation and will not imply that the shop drawings or samples for the item will be acceptable. Review of shop drawings for an item will depend upon full compliance with the Contract Documents as demonstrated by material submitted.

GP-14.03. ELECTRICAL INTERCONNECTIONS

Where the Project includes electrical equipment and electrical control systems and where the Work of the Project involves more than one Contractor, it shall be the responsibility of the Electrical Contractor to coordinate and complete power, control, and electrical signal interconnections for all equipment included in the Project.

GP-14.04. SHOP DRAWING SUBMITTAL REQUIREMENTS

Shop drawings and data shall be submitted to the Engineer for each item on the latest revised list determined from Section GP-14.01 above. Submittals shall be made sufficiently in advance of the time when items included therein are to be incorporated into the Work to permit proper review, necessary revisions, and resubmittals without causing a delay in the performance of the Work.

Shop drawings shall present complete and accurate information relative to all working dimensions, equipment weights, assembly, and section views, and all necessary details pertaining to coordinating the Work of the Contract, lists of materials and finishes, parts lists and the description thereof, lists of spare parts and tools where such parts or tools are required, and any other items of information that are required to demonstrate detailed compliance with the Contract Documents. Drawings for electrical equipment shall include elementary and interconnection diagrams.

Except as otherwise provided in Section 13.02, Contractor's submittal of Shop Drawings shall constitute Contractor's representation that submitted Shop Drawings and the specifications pertaining thereto have been thoroughly reviewed by Contractor for consistency with the Specifications and that submitted Shop Drawings strictly comply with the requirements of the Contract Documents; that the Contractor has determined and verified all quantities, dimensions, field construction criteria, materials catalog numbers, and similar data, and that Contractor has reviewed or coordinated each shop drawing with the requirements of the Work and the Contract Documents. The return to Contractor of Shop Drawings stamped "Reviewed" shall in no way relieve Contractor from sole responsibility for strictly complying with the specifications in the Contract Documents. Contractor shall reimburse Owner for the costs (including labor costs) and expenses of Engineer incurred in the review of Shop Drawings which have been twice before returned marked as "Rejected" or "Resubmit".

Unless otherwise permitted in specific cases, all data shall be transmitted to the Engineer by the Prime Contractor.

Each shop drawing submitted shall indicate the following:

(a) Project name and contract number

(b) Manufacturer of the equipment

(c) Notation as to whether original submittal or resubmittal

(d) Date received by Contractor from manufacturer or vendor

(e) Date submitted to Engineer

Each shop drawing submittal shall be accompanied by a transmittal letter indicating the item or items submitted, with particular reference to latest revised list of equipment, materials, and other items described in GP-14.01 above and the appropriate section of the Contract Documents to which the items apply. The transmittal letter shall also indicate whether the submittal constitutes a complete set of drawings for the item, a partial set of drawings for which additional submittals are to be expected by the Engineer, or a partial set of drawings to complete a previous submittal. In any case, the Contractor shall indicate by the transmittal letters when the submittals for an item are intended to be complete.

Unless otherwise stated in the Special Provisions, the Contractor shall submit at least five copies of drawings, catalog data, and similar items for review. This number includes one for return to the Contractor noted as "Reviewed" or request for amendment. If the Contractor desires more than one copy returned to it, it shall submit with the initial and any subsequent transmittals the additional number desired up to a maximum of three copies.

If the Engineer requires additional copies, it will so inform the Contractor upon return of the material noted as "Reviewed". Additional copies of "Reviewed" shop drawings will be requested in the cases where the subject matter shown thereon requires coordination of two or more prime Contracts. Copies of such drawings, when received, will be retransmitted by the Engineer.

A current file of "Reviewed" shop drawings will be maintained by the Engineer and, where so stated in the Special Provisions, said current file of "Reviewed" shop drawings will be at the job site. Any Contractor may have access to said "Reviewed" shop drawing file during normal office hours. It shall be the responsibility of each prime Contractor to avail itself of information in said "Reviewed" shop drawing file and to be aware of coordination requirements involving its work in the event it does not receive appropriate shop drawings from the Engineer.

GP-14.05. ENGINEER'S REVIEW OF SHOP DRAWINGS

The Engineer's review of shop drawings is for general compliance with the Contract Documents only and is not a complete check of the method of assembly, erection, construction or detailed review of the specifications. Such review shall in no way be construed as permitting any departure whatsoever from the Contract Documents, except where the Contractor has previously requested and received written approval of the Engineer for such departure. When requested by Contractor, proposed departures from the Contract Documents will be considered by Engineer at Contractor's expense, whether or not accepted. The cost of Engineer's conflict review and any revisions made as a result of Contractor's requested departure shall be at the expense of Contractor. Contractor shall reimburse Owner for the referenced costs and expenses of Engineer upon demand.

Review of shop drawings by the Engineer will be limited to complete submittals except where review of a partial submittal is specifically requested by the Contractor and where such review of a partial submittal is necessary for timely completion of the Work of the Contract. Where shop drawings of related items are necessary for review of a particular submittal, the Engineer will so inform the Contractor, who will promptly submit such shop drawing of said related items.

Drawings and similar data will be reviewed and stamped by the Engineer as follows:

(a) "Reviewed," if no change or rejection is made. All but four copies of the submitted data will be returned.

(b) "Reviewed and Noted," if minor changes or additions are made but resubmittal is not considered necessary. All but four copies of the submitted data will be returned and all copies will bear the corrective marks.

(c) "Resubmit," if the changes requested are extensive or if retransmittal of the submittal to another Contractor is required. In this case, the Contractor shall resubmit the items after correction, and the same number of copies shall be included in the resubmittal as in the first submittal. One copy of the first submittal will be retained by the Engineer and two copies will be returned to the Contractor.

(d) "Rejected," if it is considered that the data submitted cannot, with reasonable revision, meet the requirements of the Contract Drawings and Specifications.

GP-14.06. RESUBMITTALS

Any changes, other than those indicated as requested, made in drawings or other data shall be specifically brought to the attention of the Engineer upon resubmittal. Changes or additions shall not be made in, or to, "Reviewed" data without specific notice to the Engineer.

If, after reasonable correction and resubmittal of the shop drawings for an item of equipment, acceptance is not given, the Contractor shall submit the name of another manufacturer or vendor to supply the item required in accordance with GP-14.02. Should progress of the Work be delayed by the changing of the manufacturer or vendor, such a cause will not be considered an extenuating circumstance beyond the control of the Contractor, and charges for delay if otherwise applicable, will be levied and shall be born solely by the Contractor.

GP-14.07. SAMPLES

Samples shall be submitted to the Engineer as required on the latest revised list determined from Section GP-14.01. The samples shall be properly identified by tags and shall be submitted sufficiently in advance of the time when they are to be incorporated into the Work, so that rejections thereof will not cause delay. A letter of transmittal from the Contractor requesting review shall accompany such samples.

The procedures set forth in Section GP-14.05 and GP-14.06 above for shop drawings shall be used for processing samples.

SECTION 15

TEMPORARY SERVICES

GP-15A.01. TEMPORARY HEAT

It is the obligation and responsibility of the Contractor to provide and maintain temporary heat by means of portable electric, oil or gas-fired units. The Contractor shall provide and pay for all fuel and electricity used in the temporary facilities and shall provide proper smoke pipes or other means to prevent smoke or smudge from marking up walls, ceilings, or other parts of equipment.

Should the temporary heating facilities require electric service, the Contractor shall provide the necessary wiring and power.

After their installation and testing of the permanent heating system facilities, they may be used for temporary heating purposes with concurrence of the Owner. Any temporary wiring or piping required and all power consumed shall be the obligation and responsibility of the Contractor.

If the Contractor elects to utilize the permanent heating facilities included in the Project for temporary heat, it shall be the responsibility of the Contractor to guarantee the heating system for a period of one year following final acceptance of the Contract or Beneficial Occupancy, whichever comes first. It shall be the responsibility of the Contractor to replace all filters before the final acceptance of the Contract.

It shall be the responsibility of the Contractor to repair any damage to heating and ventilating equipment suffered as the result of use by the Contractor.

After the buildings are enclosed excepting windows, doors and similar apertures, temporary enclosures for all apertures shall be provided and temperatures in the entire building shall be continuously maintained at not less than 40 degrees Fahrenheit unless specific permission is granted in writing by the Engineer. The Contractor shall install on each floor, near the center of the building, a suitable, securely fastened, and properly protected thermometer.

The Owner will supply all heat after final acceptance of the Contract or upon Beneficial Occupancy of a structure by the Owner.

GP-15A.02. TEMPORARY ELECTRIC LIGHT AND POWER

It is the obligation and responsibility of the Contractor to provide and maintain temporary facilities for furnishing light and power necessary for operations under the Contract, and to make all necessary arrangements therefor, including all required connections, ordering the meter, and paying all fees and inspection charges.

The Contractor shall make the temporary light and power facilities available to any and all subcontractors, for their use in connection with their contracts, and may charge each subcontractor for such service an amount not to exceed a fraction of the cost of the services, as billed by the utility, proportional to the value of the Project. Removal of temporary facilities shall be by the Contractor. The installation and meters shall remain until need for same has ceased or until completion of the Contract.

GP-15A.03. POWER, FUEL AND WATER FOR TESTING

The permanent electrical service, or any part thereof, shall not be connected until the tests on wiring and grounding systems have been successfully completed and test data reviewed by the Engineer.

Where tests on equipment require electric power for testing, such power shall be supplied through the permanent electrical service and through the permanent electrical distribution and control equipment. All power for testing will be provided by the Owner. The use by the Owner of the permanent electrical service, electrical distribution system, and/or control equipment for the purpose of testing shall not constitute acceptance of the Work.

Where tests are specified on fuel-burning equipment, or where tests are specified on other equipment, and require simultaneous operation of the fuel burning equipment, all fuel for such tests will be provided by the Owner.

Unless otherwise specified, water of acceptable quality for testing shall be furnished by the Contractor.

GP-15A.04. TEMPORARY WATER FACILITIES

Where the public water supply is available and under control of the Owner, water will be furnished to Contractor. Such water supply shall be subject at all times to the control and supervision of the superintendent or manager of the water utility, and at a cost determined by the schedule of charges on a file at the office of the utility. Prior to making use of any municipal water, permission in writing to use the water for any particular purpose shall be obtained from the superintendent or manager. The cost, if any, of connection to the water supply shall be paid by the Contractor.

Where the public water supply is owned or controlled by a private company, corporation or individual or municipality other than the Owner, the Contractor shall make such arrangements at its cost for service with the owners thereof as he requires.

The Contractor shall make the temporary water service available to all subcontractors, for their reasonable use in connection with their Contracts. Removal of temporary facilities shall be the responsibility of the Contractor. The installation and meters shall remain until need for same has ceased or until completion of the Contract.

- END OF SECTION -

SECTION 01010

SUMMARY

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes the following:
   1. Work covered by the Contract Documents.
   2. Sequence of Operations.
   3. Utility Shutdowns
   4. Tie-ins and Disconnections
   5. Temporary Systems
   6. Use of premises.
   7. Specification formats and conventions.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

A. The Contractor shall provide all material, services, labor, tools and equipment, necessary to construct this project. The following is a brief description of the major work items included in the contract: Construction of a new pre-fabricated metal office building with 3 bay garage, asphalt paving, fencing, meter test bench, and GIS collection system as shown on the Drawings and described in the Specifications.
B. The Contractor is responsible for obtaining all applicable permits. (grading, plumbing, electrical, building) as required by local, state, and federal agencies.
C. Contractor shall provide electrical, structural, and mechanical drawings to Engineer for approval before construction can begin that meet all local, state and federal codes as described in these specifications.
D. The Contractor shall provide gas heat to the garage area (bottle gas) and electric heat to the office portion of the building. Gas heat unit shall be 80,000 BTU units (4 required) and installed on separate circuits.
E. The sewer lines for the new building shall be tied into the existing septic tank as shown on the drawings.
F. All electrical work shall be performed by a certified electrical licensed in the State of Kentucky.
G. All plumbing work shall be performed by a certified plumber licensed in the State of Kentucky.
H. The existing water line shall be located prior to construction, and may need to be relocated to avoid interference with the new office building.
I. A geo-tech investigation of the proposed building site shall be at the preference of the provider of the metal office building for structural requirements.

1.03 SEQUENCE OF OPERATIONS

A. Construction of the new office building and 3 bay garage while keeping the existing office in operation at the present location.

B. Upon completion of the office building, the existing double wide office building will be removed from the site by the Owner to a new location as described in the contract plans and specifications. All existing utilities will be capped as shown, and completion of the site work with regard to asphalt paving and fencing will be completed.

1.04 UTILITY SHUTDOWNS

A. One-week advance notice to the Owner is required prior to performing any utility shutdown unless of an emergency in nature.
B. Contractor shall know where all existing valves are located on the Howards Creek section and shall be able to shut down expeditiously in case of line breaks.
C. The existing water line is shown as an approximate location on the plans. The contractor shall use extreme caution while laying line not to break existing line and interupt service to Sandy Hook Water District. existing customers.

1.05 TIE-INS AND DISCONNECTIONS

A. Contractor shall furnish all materials and shall provide excavation, de-watering, scaffolding and support operations to support tie-ins.

1.06 TEMPORARY SYSTEM (S)

A. All temporary water lines and hoses shall be depressurized and all temporary electrical lines and equipment de-energized when not in use and at the end of each workday.

1.07 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Division and Sections using the 17-division format.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used

- END OF SECTION -

SECTION 01015

WORK SEQUENCE

PART 1 - GENERAL

1.01 WORK INCLUDED

The Contractor shall submit to the Engineer for review and acceptance a complete schedule of his proposed sequence of construction operations prior to commencement of work. However, the Engineer shall not accept a construction schedule that fails to utilize the entire time allocated for the construction of the water system extension. This schedule requirement in no way prevents the Contractor from completing the project in a shorter time frame than scheduled. The construction schedule shall be submitted and approved by the Owner prior to the submittal of the first partial payment request. A revised construction schedule shall be submitted with every subsequent partial payment request. This revised schedule must be approved by the Owner prior to payment. The contractor shall use the following sequence of construction while working on the new office building for the Sandy Hook Water District Project. **The existing office must remain accessible to customers during the construction period.**

1. Obtain all applicable permits and licensing as required by all Federal, State and Local Agencies.
2. Provide electrical, structural and plumbing drawings to the applicable entity for approval and permits.
3. Submit shop drawings to the engineer for approval.
4. Construct new office building while the existing office remains accessible to customers.
5. Tie into existing septic tank ad complete paving and fencing of site.
6. GIS collection system can be completed anytime during the contract period.

1.02 RELATED WORK

A. Section 01010 - Summary of Work.

1.03 ADDITIONAL INFORMATION

Any delays caused by the Contractor shall be at his expense and at no cost to the Owner or Engineer.

- END OF SECTION -

SECTION 01016

OCCUPANCY

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The Contractor shall be aware that after each major portion of the project is completed, the Contractor shall notify the Engineer that those specific operations are complete and prior to replacing that portion of the work into service shall request an interim inspection of the work to be returned to or placed into service.

B. The interim inspection requested by the Contractor shall not preclude or supersede the final inspection of the project or reduce the Contractor's responsibility for the completed portion prior to final acceptance of the work by the Owner.

C. The Contractor shall provide all necessary temporary controls and other items required for operation of all work placed into service prior to final acceptance as required. At such time as new controls, etc. are complete and functioning, the Contractor shall remove all temporary installed items.

- END OF SECTION -

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 WORK INCLUDED

The Contractor shall furnish all necessary labor, machinery, tools, apparatus, equipment, materials, equipment, service, other necessary supplies and perform all work, including all excavation and backfilling (without additional compensation, except where specifically set out in these specifications) at the unit or lump sum prices for the following items.

1.02 PROGRESS AND PAYMENTS SCHEDULES

A. Within ten (10) days after the date of formal execution of the AGREEMENT, the Contractor shall prepare and submit to the Engineer, for approval, a construction schedule which depicts the Contractor's plan for completing the contract requirements and show work placement in dollars versus contract time. The Contractor's construction schedule must be approved by the Engineer before any payments will be made on this contract.

B. Within ten (10) days after the date of formal execution of the CONTRACT AGREEMENT, the Contractor shall prepare and submit to the Engineer, for approval, a periodic estimate which depicts the Contractor's cost for completing the contract requirements and show by major unit of the project work, the Contractor's dollar value for the material and the labor (two separate amounts) to be used as a basis for the periodic payments. The Contractor's periodic estimate must be approved by the Engineer before any payments will be made on this contract.

C. The Engineer's decision as to sufficiency and completeness of the Contractor's construction schedule and periodic estimate will be final.

D. The Contractor must make current, to the satisfaction of the Engineer, the construction schedule and periodic estimate each time he requests a payment on this contract.

E. The Contractor's construction schedule and periodic estimate must be maintained at the construction site available for inspection and shall be revised to incorporate approved change orders as they occur.

F. When the Contractor requests a payment on this contract, it must be on the approved periodic estimate and be current. Further, the current periodic estimate and construction schedule (both updated and revised) shall be submitted for review and approval by the Engineer before monthly payments will be made by the Owner. The Contractor shall submit six (6) current copies of each (periodic estimate and construction schedule) when requesting payment.

1.03 CONDITIONS FOR PAYMENT

A. The Owner will make payments for acceptable work in place and materials properly stored on-site. The value of payment shall be as established on the approved construction schedule and periodic estimate, EXCEPT the Owner will retain ten percent (10%) of the work in place and a percentage as hereinafter listed for items properly stored or untested.

B. No payment will be made for stored materials unless a proper invoice form the supplier is attached to the pay request. Further, no item whose value is less than $1,000 will be considered as stored materials for pay purposes.

C. Payment for pipeline items shall be limited to eighty percent (80%) of the bid price until the pipeline items have been tested and clean up has been completed and accepted by the Engineer.

D. Payment for equipment items shall be limited to eighty-five percent (85%) of their scheduled value (materials portion only) until they are set in place. Eighty-five percent (85%) for stored materials and equipment shall be contingent on proper on-site storage as recommended by the manufacturer or required by the Engineer.

E. Payment for equipment items set in place shall be limited to ninety percent (90%) of their scheduled value until they are ready for operation and have been certified by the manufacturer. Ninety percent (90%) payment for installed equipment shall be contingent on proper routine maintenance of the equipment in accordance with the manufacturer's recommendations.

F. Payment for equipment items set in place and ready for operation shall be limited to ninety-five percent (95%) of their scheduled value until all acceptance tests have been completed and the required manufacturer's pre-startup operator's training has been completed.

G. Payment for the labor portion of equipment items will be subject only to the degree of completeness and the appropriate retainage.

H. The retainage shall be an amount equal to 10% of said estimate. The retainage on the equipment items shall be 10% as defined hereinbefore.

I. If at any time thereafter when the progress of the WORK is not satisfactory or determine that the Contractor is not making satisfactory progress, additional amounts may be retained.

1.04 CLAIMS FOR EXTRA WORK

A. If the Contractor claims that any instructions by Drawings or otherwise involve extra cost, he shall give the Engineer written notice of said claim within ten (10) days after the receipt of such instructions and, in any event before proceeding to execute the work, stating clearly and in detail the basis of his claim or claims. No such claim shall be valid unless so made.

B. Claims for additional compensation for extra work, due to alleged errors in spot elevations, contour lines or bench marks, will not be recognized unless accompanied by certified survey data, made prior to the time the original ground was disturbed, clearly showing that errors exist which resulted, or would result, in handling more material or performing more work than would reasonably be estimated from the Drawings and topographical maps issued.

C. Any discrepancies which may be discovered between actual conditions and those represented by the topographical maps and Drawings shall at once be reported to the Engineer, and work shall not proceed, except at the Contractor's risk, until written instructions have been received by him from the Engineer.

D. If, on the basis of the available evidence, the Engineer determines that an adjustment of the Contract Price or time is justifiable, the procedure shall then be as provided herein for "Changes in the Work".

E. By execution of this Contract, the Contractor warrants that he has visited the site of the proposed work and fully acquainted himself with the conditions there existing relating to construction and labor, and that he fully understands the facilities, difficulties and restrictions attending the execution of the work under this Contract. The Contractor further warrants that he has thoroughly examined and is familiar with the Drawings, Specifications and all other documents comprising the Contract. The Contractor further warrants that by execution of this Contract his failure when he was bidding on this Contract to receive or examine any form, instrument or document, or to visit the site and acquaint himself with conditions there existing, in no way relieves him from any obligation under the Contract, and the Contractor agrees that the Owner shall be justified in rejecting any claim based on facts regarding which he should have been on notice as a result thereof.

1.05 DETERMINATION OF THE VALUE OF EXTRA (ADDITIONAL) OR OMITTED WORK

A. The value of extra (additional) or omitted work shall be determined in one or more of the following ways:

1. On the basis of the actual cost of all the items of labor (including on-the-job supervision), materials and use of equipment, plus a maximum 20% for added work or a minimum 20% for deleted work which shall cover the Contractor's general supervision, overhead and profit. In case of subcontracts, the sum of total overhead amounts of the subcontractors and Contractor, plus total profit amounts for the subcontracts and Contractor shall not exceed 25% of the cost. Subcontractors shall be limited to 15% and Contractors shall be limited to 10% for combined overhead and profit. The cost of labor shall include required insurance, taxes and fringe benefits. Contractor to provide detailed breakdown of all cost as justification of change in work. Equipment costs shall be based on current rental rates in the areas where the work is being performed, but in no case shall such costs be greater than the current rates published by the Associated Equipment Distributors, Chicago, Illinois.

2. By estimate and acceptance in a lump sum.

3. By unit prices named in the Contract or subsequently agreed upon.

B. Provided, however, that the cost or estimated cost of all extra (additional) work shall be determined in advance of authorization by the Engineer and approved by the Owner.

C. All extra (additional) work shall be executed under the conditions of the original Contract. Any claim for extension of time shall be adjusted according to the proportionate increase or decrease in the final total cost of the work unless negotiated on another basis.

D. Except for over-runs in contract unit price items, no extra (additional) work shall be done except upon a written change Order from the Engineer, and no claim on the part of the Contractor for pay for extra (additional) work shall be recognized unless so ordered in writing by the Engineer.

PART 2 - PRODUCTS

2.01 100' x 50' PRE-FABRICATED METAL OFFICE BUILDING W/3 BAY STORAGE FACILITY

Payment is lump sum for the 100' x 50' Metal Office Building with 3 Bay Storage Facility, including all associated plumbing, mechanical and electrical equipment, pre-engineered metal building, and foundation. The payment shall constitute full compensation for all insurance, mobilization, demobilization, record drawings, meter test bench, material, equipment, supplies, all submittals, certifications, appurtenances, building erection, interior and exterior piping, HVAC equipment, lighting, septic tank, reinstallation of the existing MTU and antenna, for the total contract price. Payment shall also include all excavation (unclassified), concrete foundation, steel reinforcing, backfill, related foundation items and all site grading, block retaining wall, restoration, fees, permits, licenses as required by all government and regulative agencies, and all other items necessary for a complete installation as shown on the plans, and other related items necessary for the complete installation not enumerated elsewhere. **The existing office is to remain accessible to all customers during the construction process.**

2.02 7 FOOT HIGH SECURITY FENCING AND 16 FOOT GATE

Payment is lump sum for the proposed 7 foot high chain link security fencing and 16' sliding gate as shown on the plans. Payment to include cost of excavation, grading, concrete, materials, compaction, and other related items necessary for a complete installation.

2.03 BITUMINOUS ASPHALT PAVEMENT W/SUB-BASE

Payment is lump sum for the bituminous asphalt pavement with sub-base complete in place. Payment shall include all material, equipment, labor and include all excavation (unclassified) backfill, crushed stone sub-base, roller compaction and all other related items necessary for a complete installation. The payment shall constitute full compensation for all insurance, mobilization, demobilization, striping and painting of parking spaces, and all other items necessary for a complete installation as shown on the plans, and all other related items necessary for the complete installation and not enumerated elsewhere. This shall also include the installation of stone behind the new building within the fenced in area as shown on the plans.

2.04 GPS, GIS DATA COLLECTION, SOFTWARE, TRAINING AND COMPUTERS

Payment for this work shall be on a lump sum basis and include all field data collection of the entire one hundred miles in the Sandy Hook Water District System, including valves, hydrants, pump stations and tanks. The collection shall use a mapping grade approach and the work shall be by SDI, MapSync or approved equal. The sub-contractors shall be pre-approved by the engineer. Also included are software, GPS collection unit, two lap top computers and a minimum of 16 hours of training.

PART 3 - EXECUTION

3.01 PAY ITEMS

A. The pay items listed herein before refer to the items listed in the Bid Schedule and cover all of the pay items under the base bid for this contract.

B. Any and all other items of work listed in the specifications or shown on the Contract Drawings for this contract shall be considered incidental to and included in those pay items.

3.02 QUANTITIES OF ESTIMATE

A. Wherever the estimated quantities of work to be done and materials to be furnished under this Contract are shown in any of the documents, including the Bid Proposal, they are given for use in comparing bids and the right is especially reserved except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the Owner to complete the work contemplated by this Contract, and such increase or diminution shall not give cause for claims or liability for damages. The Engineer will not be financially responsible for any omissions from the Contract Documents and therefore not included by the Contractor in his proposal.

B. Aerial photographs utilized for plan sheets in the Contract Documents are indicated at an approximate scale and shall not be scaled for quantity take-offs. The pipeline quantities listed in the Bid Schedule are given for use in comparing bids and may not be the actual quantities to be installed. It is the Contractor's responsibility to field verify the length and quantities of pipeline to be installed prior to the ordering of materials. Payment on unit price contracts are based on actual quantities installed. The Owner or Engineer will not be financially responsible for any shortage of pipe or overrun of pipe ordered for the pipeline quantities.

C. The actual quantities of all materials to be used for this project shall be field verified prior to the Contractor ordering the necessary materials. The quantity listed in the bid schedule is given for use in comparing bids and may increase or diminish as may be deemed necessary or as directed by the Owner. Any such increase or diminution shall not give cause for claims or liability for damages. The Engineer or Owner will not be financially responsible for any charges incurred for restocking of materials ordered.

- END OF SECTION -

SECTION 01030

LABOR PROVISIONS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The Contractor shall conform to all provisions of the Kentucky Department of Labor, Wage Decisions (latest revisions), relative to minimum wages and hours as they may apply to the work to be accomplished under these specifications.

B. In addition to the above, certain Federal laws and regulations shall govern the work and shall supplement or supplant the Kentucky Department of Labor Wage Decisions cited above, as the case may be.

1.02 RELATED SECTIONS

A. Section 3 - Part 1 Hours and Wages

1.03 WAGE RATES

Prevailing wage rates apply to this job. The Contractor will utilize, when feasible, local labor and will pay them wages commensurate with the wages prevailing in the Community.

1.04 LABOR PREFERENCE

Where feasible, the Contractor will utilize local labor.

1.05 HOURS OF WORK

A. Hours of work shall be as set out in Kentucky Department of Labor Wage Decisions (latest revisions); that is, not more than eight (8) hours in one calendar day, nor more than forty (40) hours in one week, except in case of emergency caused by fire, flood or damage to life and property.

B. Any laborer, workman, mechanic, helper, assistant or apprentice working in excess of forty (40) hours per week, except in case of emergency, shall be paid not less than 1-1/2 times the wage rate. Whenever overtime work is scheduled, the Contractor shall give prior notice to the Owner.

- END OF SECTION -

SECTION 01040

COORDINATION

PART 1 - GENERAL

1.01 COORDINATION OF THE WORK

The Contractor shall coordinate the work of all the crafts, trades and subcontractors engaged on the Work, and he shall have final responsibility as regards the schedule, workmanship and completeness of each and all parts of the Work.

All crafts, trades and subcontractors shall be made to cooperate with each other and with others as they may be involved in the installation of work which adjoins, incorporates, precedes or follows the work of another. It shall be the Contractor's responsibility to point out areas of cooperation prior to the execution of subcontract agreements and the assignment of the parts of the Work. Each craft, trade and subcontractor shall be made responsible to the Owner, for furnishing embedded items, giving directions for doing all cutting and fitting, making all provisions for accommodating the Work, and for protecting, patching, repairing and cleaning as required to satisfactorily perform the Work.

The Contractor shall be responsible for all cutting, digging and other action of his subcontractors and workmen. Where such action impairs the safety or function of any structure or component of the Project, the Contractor shall make such repairs, alterations and additions as will, in the opinion of the Engineer, bring said structure or component back to its original design condition at no additional cost to the Owner.

Each subcontractor is expected to be familiar with the General Requirements and all sections of the Detailed Specifications for all other trades and to study all Drawings applicable to his work to the end that complete coordination between trades will be affected. Each Contractor shall consult with the Engineer if conflicts exist on the Drawings.

The Contractor shall conduct testing of water lines in a timely manner. The Contractor shall make provisions to test all water lines regardless of whether or not planned pump stations have been delivered and/or installed.

- END OF SECTION -

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 WORK INCLUDED

Shop drawings, descriptive literature, project data and samples (when samples are specifically requested) for all manufactured or fabricated items shall be submitted by the Contractor to the Engineer for examination and review in the form and in the manner required by the Engineer. All SUBMITTALS shall be furnished in at least six (6) copies and shall be checked, reviewed and signed by the Contractor before submission to the Engineer. The review of the Drawings by the Engineer shall not be construed as a complete check but only for conformance with the design concept of the Project and for compliance with information given in the Contract Documents. Review of such drawings will not relieve the Contractor of the responsibility for any errors that may exist, as the Contractor shall be responsible for the dimensions and design of adequate connections, details, and satisfactory construction of all work.

1.02 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. General Provision.

B. Section 01720 - Project Record Documents (As-Builts).

1.03 DEFINITIONS

The term "submittals" shall mean shop drawings, manufacturer's drawings, catalog sheets, brochures, descriptive literature, diagrams, schedules, calculations, material lists, performance charts, test reports, office and field samples, and items of similar nature which are normally submitted for the Engineer's review for conformance with the design concept and compliance with the Contract Documents.

1.04 GENERAL CONDITIONS

A. Review by the Engineer of shop drawings or SUBMITTALS of material and equipment shall not relieve the Contractor from the responsibilities of furnishing same of proper dimension, size, quality, quantity, materials and all performance characteristics to efficiently perform the requirements and intent of the Contract Documents. Review shall not relieve the Contractor from responsibility for errors of any kind on the shop drawings. Review is intended only to assure conformance with the design concept of the Project and compliance with the information given in the Contract Documents.

B. Review of shop drawings shall not be construed as releasing the Contractor from the responsibility of complying with the Specifications.

1.05 GENERAL REQUIREMENTS FOR SUBMITTALS

A. Shop Drawings:

1. Shop drawings shall be prepared by a qualified detailer. Details shall be identified by reference to sheet and detail numbers shown on Contract Drawings. Where applicable, show fabrication, layout, setting and erection details.

2. Shop drawings are defined as original drawings prepared by the Contractor, subcontractors, suppliers, or distributors performing work under this Contract. Shop drawings illustrate some portion of the work and show fabrication, layout, setting or erection details of equipment, materials and components. The Contractor shall, except as otherwise noted, have prepared

the number of reviewed copies required for his distribution plus two (2) which will be retained by the Engineer. Shop drawings shall be folded to an approximate size of 8-1/2" x 11" and in such manner that the title block will be located in the lower righthand corner of the exposed surface.

B. Project data shall include manufacturer's standard schematic drawings modified to delete information which is not applicable to the Project, and shall be supplemented to provide additional information applicable to the Project. Each copy of descriptive literature shall be clearly marked to identify pertinent information as it applies to the Project.

C. Where samples are required, they shall be adequate to illustrate materials, equipment or workmanship, and to establish standards by which completed work is judged. Provide sufficient size and quantity to clearly illustrate functional characteristics of product and material, with integrally related parts and attachment devices, along with a full range of color samples.

D. All submittals shall be referenced to the applicable item, section and division of the Specifications, and to the applicable Drawing(s) or Drawing schedule(s).

E. The Contractor shall review and check SUBMITTALS, and shall indicate his review by initials and date.

F. If the submittals deviate from the Contract Drawings and/or Specifications, the Contractor shall advise the Engineer, in letter of transmittal of the deviation and the reasons therefor. All changes shall be clearly marked on the submittal with a bold red mark. Any additional costs for modifications shall be borne by the Contractor.

G. In the event the Engineer does not specifically reject the use of material or equipment at variance to that which is shown on the Drawings or specified, the Contractor shall, at no additional expense to the Owner, and using methods reviewed by the Engineer, make any changes to structures, piping, controls, electrical work, mechanical work, etc., that may be necessary to accommodate this equipment or material. Should equipment other than that on which design drawings are based be accepted by the Engineer, shop drawings shall be submitted detailing all modification work and equipment changes made necessary by the substituted item.

H. Additional information on particular items, such as special drawings, schedules, calculations, performance curves, and material details, shall be provided when specifically requested in the technical Specifications.

I. Submittals for all electrically operated items (including instrumentation and controls) shall include complete wiring diagrams showing leads, runs, number of wires, wire size, color coding, all terminations and connections, and coordination with related equipment.

J. Equipment shop drawings shall indicate all factory or shop paint coatings applied by suppliers, manufacturers and fabricators; the Contractor shall be responsible for insuring the compatibility of such coatings with the field-applied paint products and systems.

K. Fastener specifications of manufacturer shall be indicated on equipment shop drawings.

L. Where manufacturers' brand names are given in the Specifications for building and construction materials and products, such as grout, bonding compounds, curing compounds, masonry cleaners, waterproofing solutions and similar products, the Contractor shall submit names and descriptive literature of such materials and products he proposes to use in this Contract.

M. No material shall be fabricated or shipped unless the applicable drawings or submittals have been reviewed by the Engineer and returned to the Contractor.

N. All bulletins, brochures, instructions, parts lists, and warranties packaged with and accompanying materials and products delivered to and installed in the Project shall be saved and transmitted to the Owner through the Engineer.

1.06 CONTRACTOR RESPONSIBILITIES

A. Verify field measurements, field construction criteria, catalog numbers and similar data.

B. Coordinate each submittal with requirements of Work and of Contract Documents.

C. Notify Engineer, in writing at time of submission, of deviations in submittals from requirements of Contract Documents.

D. Begin no work, and have no material or products fabricated or shipped which required submittals until return of submittals with Engineer's stamp and initials or signature indicating review.

- END OF SECTION -

SECTION 01380

VIDEO TAPE

PART 1 - GENERAL

1.01 WORK INCLUDED

The Contractor shall be responsible for video taping the entire project site both prior to construction and immediately after completion and acceptance of all work. Video tapes shall be produced by a videographer acceptable to the Engineer and of a professional quality.

1.02 VIDEO TAPE

The video tape shall be of a high quality VHS or DVD format. Video tapes shall show the time, date, and project location on screen during playback.

1.03 SUBMITTALS

The Contractor shall provide two copies of the project video tape or DVD with jackets. Both the video tapes or DVD's and jackets shall be clearly labeled with project name start date and completion date as shown below.

Project Name and Contract No.
Owner Name
Start Date: _____
Completion Date: _____

-END OF SECTION-

SECTION 01450

QUALITY CONTROL

PART 1 - GENERAL

1.01 QUALITY CONTROL

A. Work of all crafts and trades shall be laid out to lines and elevations as established by the Contractor from the Drawings or from instructions by the Engineer.

B. Unless otherwise shown, all work shall be plumb and level, in straight lines and true planes, parallel or square to the established lines and levels. The Work shall be accurately measured and fitted to tolerance as established by the best practices of the crafts and trades involved, and shall be as required to fit all parts of the Work carefully and neatly together.

C. All equipment, materials and articles incorporated into the Work shall be new and of comparable quality as specified. All workmanship shall be first-class and shall be performed by mechanics skilled and regularly employed in their respective trades.

1.02 TESTS, INSPECTIONS, AND CERTIFICATIONS OF MATERIALS

A. Tests, inspections and certifications of materials, equipment, subcontractors or completed work, as required by the various sections of the Specifications shall be obtained by the Contractor and all costs shall be included in the Contract Price.

B. The Contractor shall submit to the Engineer the name of testing laboratory to be used.

C. Contractor shall deliver written notice to the Engineer at least 24 hours in advance of any inspections or tests to be made at the Project site. All inspections, tests, samples for water quality or other procedures requiring the Engineer to attest to be conducted in the field shall be done in the presence of the Engineer or his representative.

D. Certifications by independent testing laboratories may be by copy of the attestation(s) and shall give scientific procedures and results of tests. Certifications by persons having interest in the matter shall be by original attest properly sworn to and notarized.

- END OF SECTION -

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall make his own provisions for temporary electricity and water and maintain strict supervision of use of temporary utility services as follows:

1. Enforce compliance with applicable standards.
2. Enforce safety practices
3. Prevent abuse of services.
4. Pay all utility charges required.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

A. The Contractor shall obtain and pay for all permits as required by governing authorities.

B. Obtain and pay for temporary easements required across property other than that of Owner or that is shown on the Contract Drawings.

C. The Contractor shall comply with applicable codes.

1.03 REMOVAL

A. The Contractor shall completely remove temporary materials, equipment, and offices upon completion of construction.

B. The Contractor shall repair damage caused by installation and restore to specified or original condition.

1.04 TEMPORARY LIGHTING

A. The Contractor shall furnish and install temporary lighting required for:

1. Construction needs.
2. Safe and adequate working conditions.
3. Public Safety.
4. Security lighting.
5. Temporary office and storage area lighting.

B. Service periods for safety lighting shall be as follows:

1. Within construction area: All times that authorized personnel are present.
2. Public areas: At all times.

C. Costs of Installation and Preparation: Contractor shall pay all installation, maintenance and removal costs of temporary lighting.

D. Maintenance of temporary lighting service (replacement of bulbs, etc.) shall be the sole responsibility of the General Contractor.

1.05 TEMPORARY WATER

The Contractor shall provide the water necessary for testing and disinfection. Water purchased from the Water District for flushing and testing shall be paid for at the whole sale price by the contractor. The Contractor shall supply his own hoses, chlorine for disinfection, etc.

1.06 SANITARY FACILITIES

Contractor shall provide sanitary facilities as set forth in General Provisions (GP-2.04. Sanitary Regulations).

1.07 FIELD OFFICE (Office Trailer not Required for this Contract)

The Contractor shall make his own provisions for providing the electricity, telephone, gas, water, sewer, and other utilities to his office trailer that are required or as necessary for completion of the work.

The Contractor shall be responsible for all utility charges.

PART 2 - PRODUCTS

Not used.

PART 3 – EXECUTION

3.01 IMPLEMENTATION

B. The Contractor shall provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to storm drains, adjacent areas and walkways prior to the start of any site work.

C. Straw bale dikes, silt fencing and synthetic filter fabric shall be used as necessary to protect adjacent lands, surface waters, and vegetation to achieve environmental objectives.

D. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

E. Soil deposited on pavement by construction and other contractor vehicles shall be removed and the pavement swept as required.

F. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

G. Minimize amount of bare soil exposed at one time.

H. Provide temporary measures such as berms, dikes, drains, hay bales, gabions, etc., as directed by the Engineer so as to minimize siltation due to runoff.

I. Construct fill and waste areas by selective placement to avoid erosive exposed surface of silts or clays.

J. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

3.02 OPERATION AND MAINTENANCE

A. The Contractor shall inspect, repair, and maintain erosion and sediment control measures until final stabilization has been established.

3.03 REMOVAL OF FACILITIES

A. The Contractor shall remove the temporary facilities after final stabilization has been established. Used devices (including old straw bales) shall be disposed of as Construction & Demolition debris.

3.04 DUST CONTROL

A. Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere.

- END OF SECTION -

SECTION 01530

BARRIERS

PART 1 - GENERAL

1.01 WORK INCLUDED

Temporary Railing: Temporary railing shall be provided around open pits and other locations where needed, to prevent accidents or injury to persons.

1.02 COST

The Contractor shall pay all costs for temporary railing.

- END OF SECTION -

SECTION 01540

SECURITY

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Provide barricades, lanterns and other such signs and signals as may be necessary to warn of the dangers in connection with open excavation and obstructions.

B. Provide an adequate and approved system to secure the Project area at all times, especially during non-construction periods; the Contractor shall be solely responsible for taking proper security measures.

1.02 COSTS

Contractor shall pay all costs for protection and security systems.

- END OF SECTION -

SECTION 01570

TRAFFIC REGULATION

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Construction parking control.

B. Flagmen.

C. Flares and lights.

D. Haul routes.

E. Traffic signs and signals.

F. Removal.

1.02 RELATED REQUIREMENTS

A. Section 01530 - Barriers.

B. Section 01580 - Project Identification and Signs.

PART 2 - PRODUCTS

2.01 SIGNS, SIGNALS AND DEVICES

A. Post-mounted and wall-mounted traffic control and informational signs as specified and required by local jurisdictions.

B. Automatic Traffic Control Signals: As approved by local jurisdictions.

C. Traffic Cones and Drums, Flares and Lights: As approved by local jurisdictions.

D. Flagman Equipment: As required by local jurisdictions.

PART 3 - EXECUTION

3.01 CONSTRUCTION PARKING CONTROL

A. Control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and Owner's operations.

B. Monitor parking of construction personnel's vehicles in existing facilities. Maintain vehicular access to and through parking areas.

C. Prevent parking on or adjacent to access roads or in nondesignated areas.

3.02 TRAFFIC CONTROL

A. Whenever and wherever, in the Engineer's opinion, traffic is sufficiently congested or public safety is endangered, Contractor shall furnish uniformed officers to direct traffic and to keep traffic off the highway area affected by construction operations.

B. Contractor shall abide by City regulations governing utility construction work.

C. Traffic control shall be provided according to the Kentucky Department of Highways Manual on Uniform Traffic Control Devices for Streets and Highways.

3.03 FLAGMEN

Provide trained and equipped flagmen to regulate traffic when construction operations or traffic encroach on public traffic lanes.

3.04 FLARES AND LIGHTS

Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

3.05 HAUL ROUTES

A. Consult with authorities, establish public thoroughfares to be used for haul routes and site access.

B. Confine construction traffic to designated haul routes.

C. Provide traffic control at critical areas of haul routes to regulate traffic and minimize interference with public traffic.

3.06 TRAFFIC SIGNS AND SIGNALS

A. At approaches to site and on site, install appropriate signs at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.

B. Install and operate traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control, and areas affected by Contractor's operations.

C. Relocate as work progresses, to maintain effective traffic control.

3.07 REMOVAL

Remove equipment and devices when no longer required. Repair damage caused by installation. Remove post settings to a depth of 2 feet.

- END OF SECTION -

SECTION 01580

PROJECT IDENTIFICATION AND SIGNS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The Contractor shall provide all signs required by these specifications near the site of the work. The sign shall set forth the description of the work and the names of the Owner, Engineer and Contractor as shown on the Plans or in these Specifications.

B. The Contractor shall furnish and install one (1) sign on the Project. One sign shall conform to the specifications and painted as shown on Figure I on the following page. The location of signs shall be determined by the Owner and/or Engineer at the pre-construction meeting.

PART 2 - PRODUCT

2.01 SIGN

The sign shall be constructed of 3/4" thick APA A-B Exterior grade or marine plywood. Posts shall be 4" x 4" of fencing type material. Prime all wood with white primer. Sign shall be as shown in Figure I and II.

PART 3 - EXECUTION

3.01 MAINTENANCE

The sign shall be maintained in good condition until completion of the Project.

3.02 LOCATION

The location of the project signs shall be determined at the pre-construction conference after the contract has been awarded.

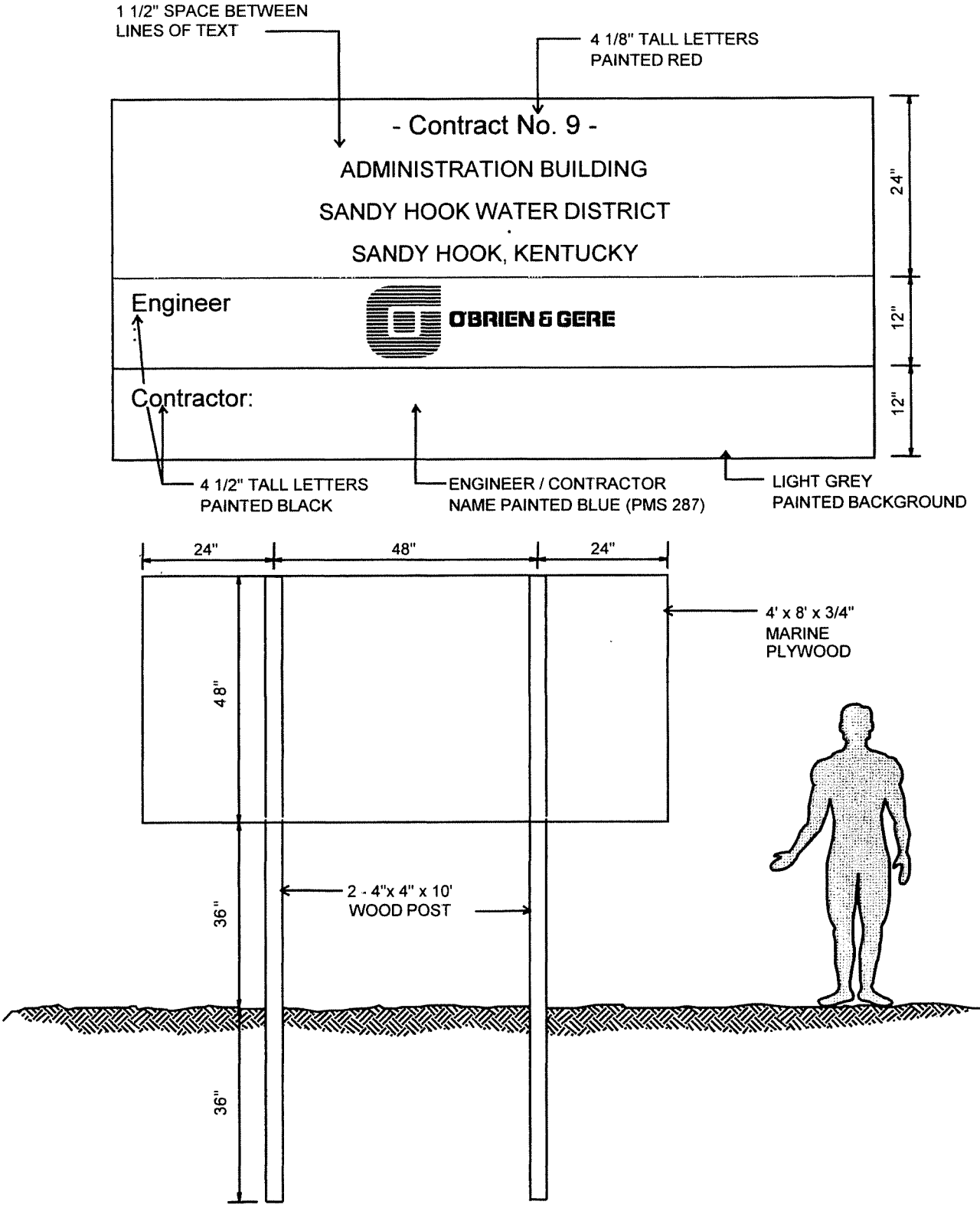

FIGURE 1

01580-2

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 COMPLIANCE WITH SAFETY REGULATIONS

The equipment items furnished shall comply with all governing Federal and State laws regarding safety, including all requirements of the Occupational Safety and Health Act of 1970 (OSHA).

PART 2 - PRODUCTS

2.01 REFERENCES

A. General Provisions: Section 10 Correction and Guarantee of Work, Section 13 Materials and Equipment.

B. Section 02600 – Pipe, Fittings, and Installation

C. Section 02640 - Valves.

D. All material shall meet applicable American Water Works Association (AWWA), American Standard Testing Methods (ASTM), Underwriters Laboratories (UL), Factory Mutual (FM), National Sanitation Foundation (NSF) standards.

SANDY HOOK WATER DISTRICT

The following is a list of approved manufacturers for the materials to be provided on the project. All material shall meet applicable AWWA, ASTM, Underwriters Laboratories, and Factory Mutual standards. The Owner approves this list and the Owner and Engineer shall approve any deviation.

MATERIAL/ITEM	APPROVED MANUFACTURER
Air Release Valve (Water and Sewer)	Apco, ARI, Primer Corp or Approved Equal
All Brass Fittings (AWWA brass)	Mueller, Ford, or Approved Equal
Aluminum Hatch	Bil-Co or Approved Equal
Blowoff Hydrant Assembly	Hydrants shall be post type Model No. A-411 as manufactured by Mueller Co. or Approved Equal.
Blowoff Hydrant Assembly (Underground)	Hydrants shall be Model No. A-412 as manufactured by Mueller Co. or Approved Equal.
Bolted Cast Couplings	Dresser, Smith & Blair, Ford, Viking-Johnson, JCM, Powerseal or Approved Equal
Brass Nipples and Pipe	State Origin

MATERIAL/ITEM	APPROVED MANUFACTURER
Brass Service Saddles	Mueller, Ford or Approved Equal
Butterfly Valves (Class 150)	Mueller Lineseal III or Approved Equal
Butterfly Valves (Class 250)	Mueller Lineseal XP or Approved Equal
Casing Spacers	State Origin
Check Valve	Valve shall be those manufactured by Muller, Kennedy, American Flow Control, or Approved Equal.
Control Valve	Valve shall be Model 710 as manufactured by Bermad or Approved Equal.
Copper Tracing Wire 14 AWG	State Origin
Customer Individual Pressure Reducing Valve	Watts N55BUM1 or Approved Equal
Customer Meter	Sensus SRII Touch Read Meters
Customer Meter Box Cover	Mid States Plastic box w/ flat CI lid w/touch read
Customer Meter Setter	Mueller or approved equal
DI and Cast Iron Full Body Tapping Sleeves	Mueller, Clow, US Pipe, American Flow or Approved Equal or Approved Equal
DI Double Strap Service Saddles	Mueller, Ford, Smith & Blair, JCM or Approved Equal
DI Pipe Class 350	Griffin, Clow, US Pipe, American DI Pipe or Approved Equal
Dual Disc Check Valve	Valve shall be Series #8800 (class 125) as manufactured by Val-Matic® Valve & Mfg. Corporation, Elmhurst, IL. USA. or Approved Equal.
Fire Hydrant	Mueller® Super Centurion 250 ® Model A-423 or Approved Equal
Flushing Hydrant Assembly	Mueller® – Super Centurion 250, Model No. A-423 or Approved Equal
Full Circle Repair Clamps (all stainless steel)	Mueller, Smith & Blair, Ford, Powerseal, Cascade or Approved Equal
Galvanized Compression Couplings	Smith & Blair, Dresser, JCM, Powerseal or Approved Equal
Gate Valves	Mueller Resilient Seat or Approved Equal
Individual Pressure Reducing Valve	Watts Model No. N55BUM1 or Approved Equal
Mainline Pressure Reducing Valve	
Manhole Ring and Cover	J. R. Hoe & Sons or Approved Equal
MJ Fittings Compact/Full Body MJ Packs	McWayne (Tyler/Union, Clow), Griffin, US Pipe, American DI Pipe or Approved Equal
Precast Concrete Manholes	Cloud, Sherman-Dixie or Approved Equal
PVC Couplings	JM Manufacturing, Harrington, Multi-Fittings or Approved Equal
PVC Pipe Class 200 or C900	Diamond, JM Manufacturing, Napco, Freedom, ETI, National, Pioneer or Approved Equal

MATERIAL/ITEM	APPROVED MANUFACTURER
Restraint Joint Collar Fittings	Mueller, McWayne, Ford, EBBA or Approved Equal
Service Tubing – Polyethylene Tubing (CTS Service Tubing)	Domestic
Service Tubing - Type K Copper Soft	Domestic
Steel Tapping Valves and Sleeves (Check Working Pressure)	Mueller, Kennedy, Ford or Approved Equal
Underground Blowoff Hydrant Assembly	Mueller Model No. A-412 or Approved Equal
Underground Detectable Tape	Shall be Lineguard brand encased aluminum foil, Type III. The identification tape is manufactured by Lineguard, Inc., P. O. Box 426, Wheaton, IL 60187 or Approved Equal

-END OF SECTION-

SECTION 01610

TRANSPORTATION AND HANDLING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Handling and Distribution:

1. The Contractor shall handle, haul, and distribute all materials and all surplus materials on the different portions of the work, as necessary or required; shall provide suitable and adequate storage room for materials and equipment during the progress of the work, and be responsible for the protection, loss of, or damage to materials and equipment furnished by him, until the final completion and acceptance of the work.

2. Storage and demurrage charges by transportation companies and vendors shall be borne by the Contractor.

B. Storage of Materials and Equipment: All excavated materials and equipment to be incorporated in the work shall be placed so as not to injure any part of the work or the existing facilities and so that free access can be had at all times to all parts of the work and to all public utility installations in the vicinity of the work. Materials and equipment shall be kept neatly piled and compactly stored in such locations as will cause a minimum of inconvenience to public travel and adjoining owners, tenants and occupants.

- END OF SECTION -

SECTION 01700

PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Liquidated Damages: General Provisions-11.20. CHARGES FOR DELAY CAUSED BY THE CONTRACTOR

B. Cleaning: Section 01710.

C. Project Record Documents: Section 01720.

1.02 SUBSTANTIAL COMPLETION

A. Contractor:

1. Submit written certification to Engineer that project is substantially complete.

2. Submit list of major items to be completed or corrected.

B. Engineer will make an inspection within seven days after receipt of certification, together with Owner's Representative.

C. Should Engineer consider that work is substantially complete:

1. Contractor shall prepare, and submit to Engineer, a list of items to be completed or corrected, as determined by the inspection.

2. Engineer will prepare and issue a Certificate of Substantial Completion, containing:

a. Date of Substantial Completion.

b. Contractor's list of items to be completed or corrected, verified and amended by Engineer.

c. The time within which Contractor shall complete or correct work of listed items.

d. Time and date Owner will assume possession of work or designated portion thereof.

e. Responsibilities of Owner and Contractor for:

(1) Insurance
(2) Utilities
(3) Operation of mechanical, electrical and other systems.
(4) Maintenance and cleaning.
(5) Security

f. Signatures of:

(1) Engineer.
(2) Contractor.
(3) Owner.

3. Owner occupancy of Project or Designated Portion of Project:

a. Contractor shall:

(1) Obtain certificate of occupancy.
(2) Perform final cleaning in accordance with Section 01710.

b. Owner will occupy Project, under provisions stated in Certificate of Substantial Completion.

4. Contractor shall complete work listed for completion or correction, within designated time.

D. Should Engineer consider that work is not substantially complete.

1. He shall immediately notify Contractor, in writing, stating reasons.

2. Contractor shall complete work, and send second written notice to Engineer, certifying that Project, or designated portion of Project is substantially complete.

3. Engineer will reinspect work.

1.03 FINAL INSPECTION

A. Contractor shall submit written certification that:

1. Contract Documents have been reviewed.

2. Project has been inspected for compliance with Contract Documents.

3. Work has been completed in accordance with Contract Documents.

4. Equipment and systems have been tested in presence of Owner's Representative and are operational.

5. Project is completed and ready for final inspection.

B. Engineer will make final inspection within seven (7) days after receipt of certification.

C. Should Engineer consider that work is finally complete in accordance with requirements of Contract Documents, he shall request Contractor to make Project Closeout submittals.

D. Should Engineer consider that work is not finally complete:

1. He shall notify Contractor, in writing, stating reasons.

2. Contractor shall take immediate steps to remedy the stated deficiencies, and send second written notice to Engineer certifying that work is complete.

3. Engineer will reinspect work.

1.04 FINAL CLEAN UP

The Work will not be considered as completed and final payment made until all final clean up has been done by the Contractor in a manner satisfactory to the Engineer. See Section 01710 for detailed requirements.

1.05 CLOSEOUT SUBMITTALS

Project Record Documents: To requirements of Section 01720.

1.06 FINAL APPLICATION FOR PAYMENT

Contractor shall submit final applications in accordance with requirements of GENERAL PROVISIONS.

1.07 FINAL CERTIFICATE FOR PAYMENT

A. Engineer will issue final certificate in accordance with provisions of GENERAL PROVISIONS.

B. Should final completion be materially delayed through no fault of Contractor, Engineer may issue a Semi-Final Certificate for Payment.

- END OF SECTION -

SECTION 01710

CLEANING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. During its progress the work and the adjacent areas affected thereby shall be kept cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.

B. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes, structures, by work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc., shall, upon completion of the work, be left in a clean and neat condition.

C. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary works, tools, and machinery or other construction equipment furnished by him; shall remove, acceptably disinfect, and cover all organic matter and material containing organics in, under, and around privies, houses, and other buildings used by him; shall remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.

D. The Contractor shall thoroughly clean all materials and equipment installed by him and his subcontractors, and on completion of the work shall deliver it undamaged and in fresh and new appearing condition.

E. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment, or employees, to a condition equal or better than that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.

1.02 DESCRIPTION

A. Related Requirements Specified Elsewhere:

1. Project Closeout: Section 01700.

2. Cleaning for Specific Products or Work: Specification Section for that work.

B. On a continuous basis, maintain premises free from accumulations of waste, debris, and rubbish, caused by operations.

C. At completion of Work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all sight-exposed surfaces; leave Project clean and ready for occupancy.

1.03 SAFETY REQUIREMENTS

A. Hazards Control:

1. Store volatile wastes in covered metal containers, and remove from premises daily.

2. Prevent accumulation of wastes, which create hazardous conditions.

3. Provide adequate ventilation during use of volatile or noxious substances.

B. Conduct cleaning and disposal operations in compliance with local ordinances and anti-pollution laws.

1. Do not burn or bury rubbish and waste materials on Project site without written permission from the Owner.

2. Do not dispose of volatile wastes such as mineral spirits, oil, or fuel in open drainage ditches or storm or sanitary drains.

3. Do not dispose of wastes into streams or waterways.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.

B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.01 DURING CONSTRUCTION

A. Execute cleaning to ensure that grounds and public properties are maintained free from accumulations of waste materials and rubbish.

B. Wet down dry materials and rubbish to minimize blowing dust.

C. At reasonable intervals during progress of Work, clean site and public properties, and dispose of waste materials, debris and rubbish.

D. Provide on-site containers for collection of waste materials, debris and rubbish.

E. Remove waste materials, debris and rubbish from site and legally dispose of at public or private dumping areas off construction site.

F. The Contractor shall thoroughly clean all materials and equipment installed.

3.02 FINAL CLEANING

A. Employ experienced workmen, or professional cleaners, for final cleaning.

B. In preparation for substantial completion, conduct final inspection of project area(s).

C. Broom clean paved surfaces; rake clean other surfaces of grounds.

D. Maintain cleaning until Project, or portion thereof, is accepted by Owner.

- END OF SECTION -

SECTION 01730

OPERATING AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Compile product data and related information appropriate for Owner's maintenance and operation of equipment furnished under the contract. Prepare operating and maintenance data as specified.

B. Instruct Owner's personnel in the maintenance and operation of equipment and systems as outlined herein and/or in other Divisions.

C. In addition to maintenance and operations data, the manufacturer's printed recommended installation practice shall also be included. If not part of the operations and maintenance manual, separate written installation instructions shall be provided, serving to assist the Contractor in equipment installation.

D. Related Requirements Specified Elsewhere:

1. Section 01300 - Submittals.
2. Section 01700 - Project Closeout.
3. Section 01720 - Project Record Documents.
4. Section 01740 - Warranties and Bonds.
5. General Provisions

1.02 MAINTENANCE AND OPERATIONS MANUAL

Every piece of equipment furnished and installed shall be provided with complete maintenance and operations manuals. These shall be detailed in instructions to the Owner's personnel. They shall be attractively bound for the Owner's records.

The manuals shall be submitted to the Engineer for review as to adequacy and completeness. Provide three (3) copies each.

1.03 FORM OF SUBMITTALS

A. Prepare data in the form of an instructional manual for use by Owner's personnel.

B. Format:

1. Size: 8-1/2 x 11 in.
2. Paper: 20 pound minimum, white, for typed pages.
3. Text: Manufacturer's printed data, or neatly typewritten.
4. Drawings:

a. Provide reinforced punched binder tab, bind with text.

b. Fold large drawings to the size of the text pages where feasible.

c. For all drawings included within manuals, furnish a 3 mil mylar copy in standard size drawings 36" x 24", 8" x 16" or 8-1/2" x 11".

d. For flow or piping diagrams that cannot be detailed on the standard size drawings, a larger, appropriate size drawing may be submitted.

5. Provide fly-leaf for each separate product, or each piece of operating equipment.

a. Provide typed description of product, and major component parts of equipment.

b. Provide indexed tabs.

6. Cover: Identify each volume with types or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS". List:

a. Title of Project.

b. Identity of separate structure as applicable.

c. Identity of general subject matter covered in the manual.

C. Binders:

1. Commercial quality, durable and cleanable, 3-hole, 3" or 4" post type binders, with oil and moisture resistant hard covers.

2. When multiple binders are used, correlate the data into related consistent grouping.

3. Labeled on the front cover and side of each binder shall be the name of the Project, the Contract Number and Volume Number.

1.04 CONTENT OF MANUAL

A. Neatly typewritten table of contents for each volume, arranged in systematic order.

1. Contractor, name of responsible principal, address and telephone number.

2. A list of each product required to be included, indexed to the content of the volume.

3. List, with each product, the name, address and telephone number of:

a. Subcontractor or installer.

b. Maintenance contractor, as appropriate.

c. Identify the area of responsibility of each.

d. Local source of supply for parts and replacement.

4. Identify each product by product name and other identifying symbols as set forth in Contract Documents.

B. Product Data:

1. Include only those sheets which are pertinent to the specific product. References to other sizes and types or models of similar equipment shall be deleted or lined out.

2. Annotate each sheet to:

   a. Clearly identify the specific product or part installed.

   b. Clearly identify the data applicable to the installation.

   c. Provide a parts list for all new equipment items, with catalog numbers and other data necessary for ordering replacement parts.

   d. Delete references to inapplicable information.

3. Clear and concise instructions for the operation, adjustment, lubrication, and other maintenance of the equipment including a lubrication chart.

C. Drawings:

1. Supplement product data with drawings as necessary to clearly illustrate:

   a. Relations of component parts of equipment and systems.

   b. Control and flow diagrams.

2. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.

3. Do not use Project Record Documents as maintenance drawings.

D. Written text, as required to supplement product data for the particular installation:

1. Organize in a consistent format under separate headings for different procedures.

2. Provide a logical sequence of instructions for each procedure.

E. Copy of each warranty, bond and service contract issued: Provide information sheet for Owner's personnel.

1. Proper procedures in the event of failure.

2. Instances which might affect the validity of warranties or bonds.

F. These manuals shall be delivered to the Engineer at the time designated by the Engineer. The manuals must be approved by the Engineer before final payment on the equipment is made.

- END OF SECTION -

SECTION 01740

WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Compile specified warranties and bonds.

B. Compile specified service and maintenance contracts.

C. Co-execute submittals when so specified.

D. Review submittals to verify compliance with Contract Documents.

E. Related requirements specified elsewhere:

1. Bid Bond: Instructions to Bidders.
2. Performance and Payment Bonds: General Provisions.
3. Guaranty: General Provisions.
4. General Warranty of Construction: General Provisions.
5. Project Closeout: Section 01700.
6. Warranties and Bonds required for specific products: As listed herein.
7. Provisions of Warranties and Bonds, Duration: Respective specification sections for particular products.
8. Operating and Maintenance Data: Section 01730.

1.02 SUBMITTALS REQUIREMENTS

A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers and subcontractors.

B. Furnish two (2) original signed copies.

C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.

1. Product, equipment or work item.
2. Firm name, address and telephone number.
3. Scope
4. Date of beginning of warranty, bond or service and maintenance contract.
5. Duration of warranty, bond or service and maintenance contract.

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, address and telephone number.

1.03 FORM OF SUBMITTALS

A. Prepare in duplicate packets.

B. Format:

1. Size 8-1/2 in. x 11 in., punch sheets for 3-ring binder: Fold larger sheets to fit into binders.

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-ring, with durable and cleanable plastic covers.

1.04 TIME OF SUBMITTALS

A. For equipment or component parts of equipment put into service during progress of construction: Submit documents within 10 days after inspection and acceptance.

B. Otherwise, make submittals within 10 days after date of substantial completion, prior to final request for payment.

C. For items of work, where acceptance is delayed materially beyond the Date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing the date of acceptance as the start of the warranty period.

1.05 SUBMITTALS REQUIRED

Submit warranties, bonds, service and maintenance contracts as specified in the respective sections of the Specifications.

- END OF SECTION -

DIVISION 2

SITE WORK

SECTION 02110

SITE CLEARING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Clear site within construction limits of plant life.

B. Remove grass and topsoil in area of access road and foundation.

C. Remove root system of trees and shrubs.

D. Remove surface debris

1.02 RELATED WORK

A. Section 02228 - Rock Removal.

B. Section 02211 - Rough Grading.

C. Section 02222 - Excavation.

1.03 REGULATORY REQUIREMENTS

Conform to applicable local codes and ordinances for disposal of debris.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 CLEARING

A. Clear areas required for access to site and execution of work.

B. Remove trees, shrubs, brush, and other vegetable matter such as snags, bark, and refuse.

3.02 PROTECTION

The Contractor shall not cut or injure any trees or other vegetation outside the easement lines and outside the areas to be cleared, as indicated on the Drawings, without written permission from the Engineer. The Contractor shall be responsible for all damage done outside these lines.

3.03 GRUBBING

From areas to be grubbed, the Contractor shall remove completely all stumps, remove to a depth of at least 24 inches below subgrade elevation all roots larger than 1 1/2 in. in diameter, and remove to a depth of 12 in. all roots larger than 1/2 in. in diameter. Such depths shall be measured from the existing ground surface, the proposed finished grade or subgrade, whichever is lower.

3.04 STRIPPING

All stumps, roots, foreign matter, topsoil, loam, and unsuitable earth shall be stripped from the ground surface. The topsoil and loam shall be utilized insofar as possible, for finished surfacing. Loam shall not be taken from the site.

3.05 DISPOSAL

A. All material resulting from clearing and grubbing and not scheduled for reuse or stockpiling shall become the property of the Contractor and shall be suitably disposed of off site, unless otherwise directed by the Engineer, in accordance with all applicable laws, ordinances, rules and regulations.

B. Such disposal shall be performed as promptly as possible after removal of the material and shall not be left until the final period of cleaning up.

3.06 FENCES

Wherever fences need to be removed to provide access to the work or are damaged during the progress of work, they shall be restored or repaired to as good a condition as existed prior to construction at the Contractor's expense.

- END OF SECTION -

SECTION 02211

ROUGH GRADING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Remove topsoil and stockpile for later reuse.

B. Excavate subsoil and stockpile for later reuse as directed in Section 022110, Backfilling and Embankments.

C. Grade and rough contour site.

1.02 RELATED WORK

A. Geotechnical data is required in this contract. Geotechnical report will be required of the contractor prior to design of the building. Minimum six holes required.

B. Section 02228 - Rock Removal.

C. Section 02222 - Excavation.

D. Section 02220 – Earthwork.

1.03 PROJECT RECORD DOCUMENTS

A. Submit documents under provisions of Section 01720.

B. Accurately record location of utilities remaining, rerouted utilities, new utilities by horizontal dimensions, elevations or inverts, and slope gradients.

1.04 PROTECTION

A. Protect trees and other features remaining as portion of final landscaping.

B. Protect bench marks, existing structures, fences, roads, sidewalks and other features not designated for demolition.

C. Protect above or below grade utilities which are to remain.

D. Contractor shall be responsible for repairing any damage to those items not designated for demolition or removal in a manner satisfactory to the Owner at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Topsoil: Excavated material, graded free of roots, rocks larger than one inch, subsoil, debris, and large weeds.

B. Subsoil: Excavated material, graded free of lumps larger than 12 inches, rocks larger than 12 inches, and debris.

PART 3 - EXECUTION

3.01 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Identify known below grade utilities. Stake and flag locations.

C. Identify and flag above grade utilities.

D. Maintain and protect existing utilities remaining which pass through work area.

E. Upon discovery of unknown utility or concealed conditions, discontinue affected work; notify Engineer.

3.02 TOPSOIL EXCAVATION

A. Excavate topsoil from areas to be further excavated, and stockpile in area designated on site by the Engineer.

B. Do not excavate wet topsoil.

C. Stockpile topsoil to depth not exceeding 8 feet.

3.03 SUBSOIL EXCAVATION

A. Excavate subsoil from indicated areas and stockpile in area designated on site. Excess subsoil may be reused according to Section 02220, Backfilling.

B. Do not excavate wet subsoil.

C. Stockpile subsoil to depth not exceeding 8 feet.

D. When excavation through roots is necessary, perform work by hand and cut roots with a sharp axe.

3.04 TOLERANCES

Top Surface of Subgrade: Plus or minus three inches.

- END OF SECTION -

SECTION 02220

EARTHWORK

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes excavation and backfilling including the loosening, removing, refilling, transporting, storage and disposal of all materials classified as "earth" necessary to be removed for the construction and completion of all work under the Contract, and as shown on the Contract Drawings, specified or directed.

1.02 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards, and specifications, except where more stringent requirements have been specified herein:

1. American Society for Testing and Materials (ASTM)

   a. A328 Specification for Steel Sheet Piling

   b. D698 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600 kN-m/m^3)

   c. D1556 Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

   d. D1760 Specification for Pressure Treatment of Timber Products

   e. D2922 Test Methods for Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth)

1.03 DEFINITIONS

A. Excavation (or Trenching)

1. Grubbing, stripping, removing, storing and rehandling of all materials of every name and nature necessary to be removed for all purposes incidental to the construction and completion of all the work under construction.

2. All sheeting, sheetpiling, bracing and shoring, and the placing, driving, cutting off and removing of the same.

3. All diking, ditching, fluming, cofferdamming, pumping, bailing, draining, well pointing, or otherwise disposing of water.

4. The removing and disposing of all surplus materials from the excavations in the manner specified.

5. The maintenance, accommodation and protection of travel and the temporary paving of highways, roads and driveways.

6. The supporting and protecting of all tracks, rails, buildings, curbs, sidewalks, pavements, overhead wires, poles, trees, vines, shrubbery, pipes, sewers, conduits or other structures or property in the vicinity of the work, whether over- or underground or which appear within or adjacent to the excavations, and the restoration of the same in case of settlement or other injury.

7. All temporary bridging and fencing and the removing of same.

B. Earth

1. All materials such as sand, gravel, clay, loam, ashes, cinders, pavements, muck, roots or pieces of timber, soft or disintegrated rock, not requiring blasting, barring, or wedging from their original beds, and specifically excluding all ledge or bedrock and individual boulders or masonry larger than one-half cubic yard in volume.

C. Backfill

1. The refilling of excavation and trenches to the line of filling indicated on the Contract Drawings or as directed using materials suitable for refilling of excavations and trenches; and the compacting of all materials used in filling or refilling by rolling, ramming, watering, puddling, etc., as may be required.

D. Spoil

1. Surplus excavated materials not required or not suitable for backfills or embankments.

E. Embankments

1. Fills constructed above the original surface of the ground or such other elevation as specified or directed.

F. Limiting Subgrade

1. The underside of the pipe barrel for pipelines
2. The underside of footing lines for structures

G. Excavation Below Subgrade

1. Excavation below the limiting subgrades of structures or pipelines.

2. Where materials encountered at the limiting subgrades are not suitable for proper support of structures or pipelines, the Contractor shall excavate to such new lines and grades as required.

PART 2 PRODUCTS

2.01 MATERIALS AND CONSTRUCTION

A. Wood Sheeting and Bracing

1. Shall be sound and straight; free from cracks, shakes and large or loose knots; and shall have dressed edges where directed.

2. Shall conform to National Design Specifications for Stress Grade Lumber having a minimum fiber stress of 1200 pounds per square inch.

3. Sheeting and bracing to be left-in-place shall be pressure treated in accordance with ASTM D1760 for the type of lumber used and with a preservative approved by the Engineer.

B. Steel Sheeting and Bracing

1. Shall be sound

2. Shall conform to ASTM A328 with a minimum thickness of 3/8 inch.

PART 3 EXECUTION

3.01 UNAUTHORIZED EXCAVATION

A. Whenever excavations are carried beyond or below the lines and grades shown on the Contract Drawings, or as given or directed by the Engineer, all such excavated space shall be refilled with special granular materials, concrete or other materials as the Engineer may direct. All refilling of unauthorized excavations shall be at the Contractor's expense.

B. All material which slides, falls or caves into the established limits of excavations due to any cause whatsoever, shall be removed and disposed of at the Contractor's expense and no extra compensation will be paid the Contractor for any materials ordered for refilling the void areas left by the slide, fall or cave-in.

3.02 REMOVAL OF WATER

A. General

1. The Contractor shall at all times provide and maintain proper and satisfactory means and devices for the removal of all water entering the excavations, and shall remove all such water as fast as it may collect, in such manner as shall not interfere with the prosecution of the work or the proper placing of pipes, structures, or other work.

2. Unless otherwise specified, all excavations which extend down to or below the static groundwater elevations shall be dewatered by lowering and maintaining the groundwater beneath such excavations at all times when work thereon is in progress, during subgrade preparation and the placing of the structure or pipe thereon.

3. Water shall not be allowed to rise over or come in contact with any masonry, concrete or mortar, until at least 24 hours after placement, and no stream of water shall be allowed to flow over such work until such time as the Engineer may permit.

4. Where the presence of fine grained subsurface materials and a high groundwater table may cause the upward flow of water into the excavation with a resulting quick or unstable condition, the Contractor shall install and operate a well point system to prevent the upward flow of water during construction.

5. Water pumped or drained from excavations, or any sewers, drains or water courses encountered in the work, shall be disposed of in a suitable manner without injury to adjacent property, the work under construction, or to pavements, roads, drives, and

water courses. No water shall be discharged to sanitary sewers. Sanitary sewage shall be pumped to sanitary sewers or shall be disposed of by an approved method.

6. Any damage caused by or resulting from dewatering operations shall be the sole responsibility of the Contractor.

B. Work Included

1. The construction and removal of cofferdams, sheeting and bracing, and the furnishing of materials and labor necessary therefor.

2. The excavation and maintenance of ditches and sluiceways.

3. The furnishing and operation of pumps, well points, and appliances needed to maintain thorough drainage of the work in a satisfactory manner.

C. Well Point Systems

1. Installation

a. The well point system shall be designed and installed by or under the supervision of an organization whose principal business is well pointing and which has at least five consecutive years of similar experience and can furnish a representative list of satisfactory similar operations.

b. Well point headers, points and other pertinent equipment shall not be placed within the limits of the excavation in such a manner or location as to interfere with the laying of pipe or trenching operations or with the excavation and construction of other structures.

c. Detached observation wells of similar construction to the well points shall be installed at intervals of not less than 50 feet along the opposite side of the excavation from the header pipe and line of well points, to a depth of at least 5 feet below the proposed excavation. In addition, one well point in every 50 feet shall be fitted with a tee, plug and valve so that the well point can be converted for use as an observation well. Observation wells shall be not less than 1-½ inches in diameter.

d. Standby gasoline or diesel powered equipment shall be provided so that in the event of failure of the operating equipment, the standby equipment can be readily connected to the system. The standby equipment shall be maintained in good order and actuated regularly not less than twice a week.

2. Operation

a. Where well points are used, the groundwater shall be lowered and maintained continuously (day and night) at a level not less than 2 feet below the bottom of the excavation. Excavation will not be permitted at a level lower than 2 feet above the water level as indicated by the observation wells.

b. The effluent pumped from the well points shall be examined periodically by qualified personnel to determine if the system is operating satisfactorily without the removal of fines.

c. The water level shall not be permitted to rise until construction in the immediate area is completed and the excavation backfilled.

3.03 STORAGE OF MATERIALS

A. Sod

1. Any sod cut during excavation shall be removed and stored during construction so as to preserve the grass growth. Sod damaged while in storage shall be replaced in like kind at the sole expense of the Contractor.

B. Topsoil

1. Topsoil suitable for final grading shall be removed and stored separately from other excavated material.

C. Excavated Materials

1. All excavated materials shall be stored in locations so as not to endanger the work, and so that easy access may be had at all times to all parts of the excavation. Stored materials shall be kept neatly piled and trimmed, so as to cause as little inconvenience as possible to public travel or to adjoining property holders.

2. Special precautions must be taken to permit access at all times to fire hydrants, fire alarm boxes, police and fire department driveways, and other points where access may involve the safety and welfare of the general public.

3.

3.04 DISPOSAL OF MATERIALS

A. Spoil Material

1. All spoil materials shall be disposed of as required by the local, state or federal regulations pertaining to the area or as described in the Special Provisions or on the Contract Drawings.

2. The surface of all spoil areas shall be graded and dressed and no unsightly mounds or heaps shall be left on completion of the work.

3.05 SHEETING AND BRACING

A. Installation

1. The Contractor shall furnish, place and maintain such sheeting, bracing and shoring as may be required to support the sides and ends of excavations in such manner as to prevent any movement which could, in any way, injure the pipe, structures, or other work; diminish the width necessary for construction; otherwise damage or delay the work of the Contract; endanger existing structures, pipes or pavements; or cause the excavation limits to exceed the right-of-way limits.

2. In no case will bracing be permitted against pipes or structures in trenches or other excavations.

3. Sheeting shall be driven as the excavation progresses, and in such manner as to maintain pressure against the original ground at all times. The sheeting shall be driven vertically with the edges tight together, and all bracing shall be of such design and strength as to maintain the sheeting in its proper position. Seepage which carries fines through the sheeting shall be plugged to retain the fines.

4. Where breast boards are used between soldier pile, the boards shall be back packed with soil to maintain support.

5. The Contractor shall be solely responsible for the adequacy of all sheeting and bracing.

B. Removal

1. In general, all sheeting and bracing, whether of steel, wood or other material, used to support the sides of trenches or other open excavations, shall be withdrawn as the trenches or other open excavations are being refilled. That portion of the sheeting extending below the top of a pipe or structural foundation shall not be withdrawn, unless otherwise directed, before more than 6 inches of earth is placed above the top of the pipe or structural foundation and before any bracing is removed. The voids left by the sheeting shall be carefully refilled with selected material and rammed tight with tools especially adapted for the purpose or otherwise as may be approved.

2. The Contractor shall not remove sheeting and bracing until the work has attained the necessary strength to permit placing of backfill.

C. Left in Place

1. If, to serve any purpose of his own, the Contractor files a written request for permission to leave sheeting or bracing in the trench or excavation, the Engineer may grant such permission, in writing, on condition that the cost of such sheeting and bracing be assumed and paid by the Contractor.

2. The Contractor shall leave in place all sheeting, shoring and bracing which are shown on the Contract Drawings or specified to be left in place or which the Engineer may order, in writing, to be left in place. All shoring, sheeting and bracing shown or ordered to be left in place will be paid for under the appropriate item of the Contract. No payment allowance will be made for wasted ends or for portions above the proposed cutoff level which are driven down instead of cut-off.

3. In case sheeting is left in place, it shall be cut off or driven down as directed so that no portion of the same shall remain within 12 inches of the street subgrade or finished ground surface.

3.06 BACKFILLING

A. General

1. All excavations shall be backfilled to the original surface of the ground or to such other grades as may be shown, specified or directed.

2. Backfilling shall be done with suitable excavated materials which can be satisfactorily compacted during refilling of the excavation. In the event the excavated materials are not suitable, Special Backfill as specified or ordered by the Engineer shall be used for backfilling.

4. Any settlement occurring in the backfilled excavations shall be refilled and compacted.

B. Unsuitable Materials

1. Stones, pieces of rock or pieces of pavement greater than 1 cubic foot in volume or greater than 1.5 feet in any single dimension shall not be used in any portion of the backfill.

2. All stones, pieces of rock or pavement shall be distributed through the backfill and alternated with earth backfill in such a manner that all interstices between them shall be filled with earth.

3. Frozen earth shall not be used for backfilling.

C. Compaction and Density Control

1. The compaction shall be as specified for the type of earthwork, i.e., structural, trenching or embankment.

a. The compaction specified shall be the percent of maximum dry density.

b. The compaction equipment shall be suitable for the material encountered.

2. Where required, to assure adequate compaction, in-place density test shall at the expense of the Contractor be made by an approved testing laboratory.

a. The moisture-density relationship of the backfill material shall be determined by ASTM D698, Method D.

1) Compaction curves for the full range of materials used shall be developed.

b. In-place density shall be determined by the methods of ASTM D1556 or ASTM D2922 and shall be expressed as a percentage of maximum dry density.

3. Where required, to obtain the optimum moisture content, the Contractor shall add, at his expense, sufficient water during compaction to assure the specified maximum density of the backfill. If, due to rain or other causes, the material exceeds the optimum moisture content, it shall be allowed to dry, assisted if necessary, before resuming compaction or filling efforts.

4. The Contractor shall be responsible for all damage or injury done to pipes, structures, property or persons due to improper placing or compacting of backfill.

3.07 OTHER REQUIREMENTS

A. Drainage

1. All material deposited in roadway ditches or other water courses shall be removed immediately after backfilling is completed and the section, grades and contours of such ditches or water courses restored to their original condition, in order that surface drainage will be obstructed no longer than necessary.

B. Unfinished Work

1. When, for any reason, the work is to be left unfinished, all trenches and excavations shall be filled and all roadways, sidewalks and watercourses left unobstructed with their surfaces in a safe and satisfactory condition. The surface of all roadways and sidewalks shall have a temporary pavement.

C. Hauling Material on Streets

1. When it is necessary to haul material over the streets or pavements, the Contractor shall provide suitable tight vehicles so as to prevent deposits on the streets or pavements. In all cases where any materials are dropped from the vehicles, the Contractor shall clean up the same as often as required to keep the crosswalks, streets and pavements clean and free from dirt, mud, stone and other hauled material.

D. Dust Control

1. It shall be the sole responsibility of the Contractor to control the dust created by any and all of his operations to such a degree that it will not endanger the safety and welfare of the general public.

2. Calcium chloride and petroleum products shall not to be used for dust control.

E. Test Pits

1. For the purpose of obtaining detail locations of underground obstructions, the Contractor shall make excavations in advance of the work. Payment for the excavations ordered by the Engineer will be made under an appropriate item of the Contract and shall include sheeting, bracing, pumping, excavation and backfilling.

- END OF SECTION -

SECTION 02222

EXCAVATION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Structure excavation.

B. Shoring excavations.

1.02 RELATED WORK

A. Geotechnical data is required in this contract. Geotechnical report will be required of the contractor and submitted to the engineer prior to design of the building. Minimum six holes required.

B. Section 01450 - Quality Control.

C. Section 02228 - Rock Removal.

D. Section 02211 - Rough Grading.

E. Section 02220 - Backfilling and Embankments.

F. Section 02226 - Trenching.

1.03 REGULATORY REQUIREMENTS

A. Protect excavations by shoring, bracing, sheet piling, underpining, or other methods required to prevent cave-in or loose soil from falling into excavation.

B. Underpin adjacent structures which may be damaged by excavation work, including service utilities and pipe chases.

C. Notify Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.

D. Protect bottom of excavations and soil adjacent to and beneath foundations from frost.

E. Grade excavation top perimeter to prevent surface water run-off into excavation.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Subsoil: Excavated material, graded free of lumps larger than 12 inches, rocks larger than 12 inches, and debris.

B. # 57's or # 9's: Mineral aggregate graded 1/4 inch to 5/8 inch, free of soil, subsoil, clay, shale, or foreign matter.

PART 3 - EXECUTION

3.01 PREPARATION

Identify required liens, levels, contours, and datum.

3.02 EXCAVATION

A. Excavate subsoil required for structure foundations, construction operations, and other work. All excavation shall be unclassified excavation.

B. Contractor is responsible to adequately brace open cuts and protect workmen and equipment from cave-in.

C. Remove lumped subsoil, boulders, and rock up to 1/3 cu. yd., measured by volume. Remove larger material under Section 02228.

D. Correct unauthorized excavation at no cost to Owner.

E. Fill over-excavated areas under structure bearing surfaces in accordance with direction by Engineer.

F. Stockpile excavated material in area designated on site.

3.03 FIELD QUALITY CONTROL

Provide for visual inspection of rock surfaces under provisions of Section 01450.

- END OF SECTION -

SECTION 02226

TRENCHING, BACKFILLING AND COMPACTING

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes excavation and backfill as required for pipe installation or other construction in the trench, and removal and disposal of water, in accordance with the applicable provisions of the Section entitled "Earthwork" unless modified herein.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 EXCAVATION

A. The trench excavation shall be located as shown on the Contract Drawings or as specified. Under ordinary conditions, excavation shall be by open cut from the ground surface. Where the depth of trench and soil conditions permit, tunneling may be required beneath cross walks, curbs, gutters, pavements, trees, driveways, railroad tracks and other surface structures. No additional compensation will be allowed for such tunneling over the price bid for open cut excavation of equivalent depths below the ground surface unless such tunnel excavation is specifically provided for in the Contract Documents.

B. Trenches shall be excavated to maintain the depths as shown on the Contract Drawings or as specified for the type of pipe to be installed.

C. The alignment and depth shall be determined and maintained by the use of a string line installed on batter boards above the trench, a double string line installed along side of the trench or a laser beam system.

D. The minimum width of trench excavation shall be 6-inches on each side of the pipe hub for 21-inch diameter pipe and smaller and 12-inches on each side of the pipe hub for 24-inch diameter pipe and larger.

E. Trenches shall not be opened for more than 300 feet in advance of pipe installation nor left unfilled for more than 100 feet in the rear of the installed pipe when work is in progress without the consent of the Engineer. Open trenches shall be protected and barricaded as required.

F. Bridging across open trenches shall be constructed and maintained where required.

3.02 SUBGRADE PREPARATION FOR PIPE

A. Where pipe is to be laid on undisturbed bottom of excavated trench, mechanical excavation shall not extend lower than the finished subgrade elevation at any point.

B. Where pipe is to be laid on special granular material the excavation below subgrade shall be to the depth specified or directed. The excavation below subgrade shall be refilled with

special granular material as specified or directed, shall be deposited in layers not to exceed 6 inches and shall be thoroughly compacted prior to the preparation of pipe subgrade.

C. The subgrade shall be prepared by shaping with hand tools to the contour of the pipe barrel to allow for uniform and continuous bearing and support on solid undisturbed ground or embedment for the entire length of the pipe.

D. Pipe subgrade preparation shall be performed immediately prior to installing the pipe in the trench. Where bell holes are required they shall be made after the subgrade preparation is complete and shall be only of sufficient length to prevent any part of the bell from becoming in contact with the trench bottom and allowing space for joint assembly.

3.03 STORAGE OF MATERIALS

A. Traffic shall be maintained at all times in accordance with the applicable Highway Permits. Where no Highway Permit is required at least one-half of the street must be kept open for traffic.

B. Where conditions do not permit storage of materials adjacent to the trench, the material excavated from a length as may be required, shall be removed by the Contractor, at his cost and expense, as soon as excavated. The material subsequently excavated shall be used to refill the trench where the pipe had been built, provided it be of suitable character. The excess material shall be removed to locations selected and obtained by the Contractor.

1. The Contractor shall, at his cost and expense, bring back adequate amounts of satisfactory excavated materials as may be required to properly refill the trenches.

C. If directed by the Engineer, the Contractor shall refill trenches with select fill or other suitable materials and excess excavated materials shall be disposed of as spoil.

3.04 REMOVAL OF WATER AND DRAINAGE

A. The Contractor shall at all times provide and maintain proper and satisfactory means and devices for the removal of all water entering the trench, and shall remove all such water as fast as it may collect, in such manner as shall not interfere with the prosecution of the work.

B. The removal of water shall be in accordance with the Section entitled "Earthwork".

3.05 PIPE EMBEDMENT

A. All pipe shall be protected from lateral displacement and possible damage resulting from superimposed backfill loads, impact or unbalanced loading during backfilling operations by being adequately embedded in suitable pipe embedment material. To ensure adequate lateral and vertical stability of the installed pipe during pipe jointing and embedment operations, a sufficient amount of the pipe embedment material to hold the pipe in rigid alignment shall be uniformly deposited and thoroughly compacted on each side, and back of the bell, of each pipe as laid.

B. Concrete cradle and encasement of the class specified shall be installed where and as shown on the Contract Drawings or ordered by the Engineer. Before any concrete is placed, the pipe shall be securely blocked and braced to prevent movement or flotation. The concrete cradle or encasement shall extend the full width of the trench as excavated unless otherwise authorized by the Engineer. Where concrete is to be placed in a sheeted trench it shall be poured directly against sheeting to be left in place or against a bond-breaker if the sheeting is to be removed.

C. Embedment materials placed above the centerline of the pipe or above the concrete cradle to a depth of 12 inches above the top of the pipe barrel shall be deposited in such manner as to

not damage the pipe. Compaction shall be as required for the type of embedment being installed.

3.06 BACKFILL ABOVE EMBEDMENT

A. The remaining portion of the pipe trench above the embedment shall be refilled with suitable materials compacted as specified.

1. Where trenches are within the ditch-to-ditch limits of any street or road or within a driveway or sidewalk, or shall be under a structure, the trench shall be refilled in horizontal layers not more than 8 inches in thickness, and compacted to obtain 95% maximum density, and determined as set forth in the Section entitled "Earthwork".

2. Where trenches are in open fields or unimproved areas outside of the ditch limits of roads, the backfilling may be by placing the material in the trench and mounding the surface.

3. Hand tamping shall be required around buried utility lines or other subsurface features that could be damaged by mechanical compaction equipment.

B. Backfilling of trenches beneath, across or adjacent to drainage ditches and water courses shall be done in such a manner that water will not accumulate in unfilled or partially filled trenches and the backfill shall be protected from surface erosion by adequate means.

1. Where trenches cross waterways, the backfill surface exposed on the bottom and slopes thereof shall be protected by means of stone or concrete rip-rap or pavement.

C. All settlement of the backfill shall be refilled and compacted as it occurs.

D. Temporary pavement shall be placed as specified in the Section entitled "Restoration of Surfaces".

-END OF SECTION-

SECTION 02228

ROCK REMOVAL

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes removal to the widths and depths shown on the Contract Drawings or as directed by the Engineer, including the loosening, removing, transporting, storing and disposal of all materials requiring blasting, barring, or wedging for removal from their original beds, and backfill of rock excavations with acceptable materials

B. Use of explosives for rock removal shall be used only with prior permission from both the Engineer and Owner.

C. Rock removal is part of and incidental to unclassified excavation. No separate payment shall be made for rock removal.

1.02 SUBMITTALS

A. In addition to those submittals identified in the General Provisions, the following items shall be submitted:

1. Before any blasting operations begin the Contractor shall obtain all permits and licenses required.

1.03 DEFINITIONS

A. Rock

1. All pieces of ledge or bedrock, boulders or masonry larger than one-half cubic yard in volume.

2. Any material requiring blasting, barring, or wedging for removal from its original bed.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 BLASTING **(Use of explosives for rock removal shall be used only with prior permission from both the Engineer and Owner.)**

A. General

1. Handling of explosives and blasting shall be done only by experienced persons.

2. Handling and blasting shall be in accordance with all Federal, State and local laws, rules and regulations relating to the possession, handling, storage and transportation and use of explosives.

3. All blasts in open cut shall be properly covered and protected with approved blasting mats.

4. Charges shall be of such size that the excavation will not be unduly large and shall be so arranged and timed that adjacent rock, upon or against which pipelines or structures are to be built, will not be shattered.

5. Blasting will not be permitted within 25 feet of pipelines or structures.

6. All existing pipes or structures exposed during excavation shall be adequately protected from damage before proceeding with the blasting.

7. NFPA 495 - Code for Manufacture, Transportation, Storage and Use of Explosive Materials.

8. Commonwealth of Kentucky Department of Mines and Minerals, Laws and Regulations Governing Explosives and Blasting.

B. Repair of Damages Due to Blasting

1. Any injury or damage to the work or to existing pipes or structures shall be repaired or rebuilt by the Contractor at his expense.

2. Whenever blasting may damage adjacent rock, pipes or structures, blasting shall be discontinued and the rock removed by drilling, barring, wedging or other methods.

C. Explosives

1. At no time shall an excessive amount of explosives be kept at the site of the work. Such explosives shall be stored, handled and used in conformity with all applicable laws and regulations.

2. Accurate daily records shall be kept showing the amounts of explosives on hand, both at the site and at any storage magazine, the quantities received and issued, and the purpose for which issued.

3. The Contractor shall be responsible for any damage or injury to any persons, property or structures as a result of his handling, storage or use of explosives.

D. Rock Clearance in Trenches

1. Ledge rock, boulders and large stones shall be removed from the sides and bottom of the trench to provide clearance for the specified embedment of each pipe section, joint or appurtenance; but in no instance shall the clearance be less than 6 inches. Additional clearance at the pipe bell or joint shall be provided to allow for the proper make-up of the joint.

2. At the transition from an earth bottom to a rock bottom the minimum bottom clearance shall be 12 inches for a distance of not less than 5 feet.

E. Rock Clearance at Structures

1. Concrete for structures shall be placed directly on the rock and the excavation shall be only to the elevations and grades shown on the Contract Drawings.

3.02 EXCAVATION AND BACKFILL

A. Rock removal and backfilling shall be performed in accordance with the applicable provisions of the Section entitled "Earthwork".

B. The rock excavated which cannot be incorporated into the backfill material, as specified, shall be disposed of as spoil and shall be replaced with the quantity of acceptable material required for backfilling.

-END OF SECTION-

SECTION 02270

SLOPE PROTECTION AND EROSION CONTROL

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The Contractor shall do all work and take all measures necessary to control soil erosion resulting from construction operations, shall prevent the flow of sediment from the construction site, and shall contain construction materials (including excavation and backfill) within his protected working area so as to prevent damage to adjacent property.

B. The Contractor shall not employ any construction method that violates a rule, regulation, guideline or procedure established by Federal, State or local agencies having jurisdiction over the environmental effects of construction. The Contractor shall be responsible for obtaining all associated permits.

C. Pollutants such as chemicals, fuels, lubricants, bitumen, raw sewage and other harmful waste shall not be discharged into or alongside of any body of water or into natural or man-made channels leading thereto.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Temporary Slope Protection and Erosion Control:

Bales may be hay or straw, and shall be reasonably clean and free of noxious weeds and deleterious materials. Filter fabric for sediment traps shall be of suitable materials acceptable to the Engineer.

B. Permanent Slope Protection and Erosion Control:

On slopes 2H:1V and steeper, and where shown on the drawings place Type A Dumped Rock Fill with a 24-inch minimum thickness over non-woven geotextile filter fabric.

PART 3 - EXECUTION

3.01 METHODS OF CONSTRUCTION

A. The Contractor shall use any of the acceptable methods necessary to control soil erosion and prevent the flow of sediment to the maximum extent possible. These methods shall include, but not be limited to, the use of water diversion structures, diversion ditches and settling basins.

B. Construction operations shall be restricted to the areas of work indicated on the Drawings and to the area which must be entered for the construction of temporary or permanent facilities. The Engineer has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and fill operations and to direct the Contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of the wetlands and adjacent watercourses. Such work may involve the construction of temporary berms, dikes, dams, sediment basins, slope drains, and use of temporary mulches, mats, or other control devices or methods as necessary to control erosion.

C. Excavated soil material shall not be placed adjacent to the wetlands or watercourses in a manner that will cause it to be washed away by high water or runoff. Earth berms or diversions shall be constructed to intercept and

divert runoff water away from critical areas. Diversion outlets shall be stable or shall be stabilized by means acceptable to the Engineer. If for any reason construction materials are washed away during the course of construction, the Contractor shall remove those materials from the fouled areas as directed by the Engineer.

D. For work within easements, all materials used in construction such as excavation, backfill, roadway, and pipe bedding and equipment shall be kept within the limits of the easements.

E. The Contractor shall not pump silt-laden water from trenches or other excavations into the wetlands, or adjacent watercourses. Instead, silt-laden water from his excavations shall be discharged within areas surrounded by baled hay or into sediment traps to ensure that only sediment-free water is returned to the watercourses. Damage to vegetation by excessive watering or silt accumulation in the discharge area shall be avoided.

F. Prohibited construction procedures include, but are not limited to, the following:

1. Dumping of spoil material into any streams, wetlands, surface waters, or unspecified locations.

2. Indiscriminate, arbitrary, or capricious operation of equipment in wetlands or surface waters.

3. Pumping of silt-laden water from trenches or excavations into surface waters, or wetlands.

4. Damaging vegetation adjacent to or outside of the construction area limits.

5. Disposal of trees, brush, debris, paints, chemicals, asphalt products, concrete curing compounds, fuels, lubricants, insecticides, washwater from concrete trucks or hydroseeders, or any other pollutant in wetlands, surface waters, or unspecified locations.

6. Permanent or unauthorized alteration of the flow line of any stream.

7. Open burning of debris from the construction work.

G. Any temporary working roadways required shall be clean fill approved by the Engineer. In the event fill is used, the Contractor shall take every precaution to prevent the fill from mixing with native materials of the site. All such foreign fill materials shall be removed from the site following construction.

3.02 EROSION CHECKS

The Contractor shall furnish and install baled hay or straw erosion checks in all locations indicated on the Drawings, surrounding the base of all deposits of stored excavated material outside of the disturbed area, and where indicated by the Engineer. Checks, where indicated on the Drawings, shall be installed immediately after the site is cleared and before trench excavation is begun at the location indicated. Checks located surrounding stored material shall be located approximately 6 ft. from that material. Bales shall be held in place with two 2 in. by 2 in. by 3 ft. wooden stakes. Each bale shall be butted tightly against the adjoining bale to preclude short circuiting of the erosion check.

- END OF SECTION -

SECTION 02502

RESTORATION OF SURFACES

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes restoration and maintenance of all types of surfaces, sidewalks, curbs, gutters, culverts and other features disturbed, damaged or destroyed during the performance of the work under or as a result of the operations of the Contract.

B. The quality of materials and the performance of work used in the restoration shall produce a surface or feature equal to the condition of each before the work began.

1.02 REFERENCES

A. Materials and installation shall be in accordance with the latest revisions of the following codes, standards and specifications, except where more stringent requirements have been specified herein:

1. American Society for Testing and Materials (ASTM)

a. D698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600 kN-m/m^3)

1.03 SUBMITTALS

A. In addition to those submittals identified in the General Provisions, the following items shall be submitted:

1. A schedule of restoration operations. After an accepted schedule has been agreed upon it shall be adhered to unless otherwise revised with the approval of the Engineer.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 GENERAL

A. In general, permanent restoration of paved surfaces will not be permitted until one months' time has elapsed after excavations have been completely backfilled as specified. A greater length of time, but not more than nine months may be allowed to elapse before permanent restoration of street surfaces is undertaken, if additional time is required for shrinkage and settlement of the backfill.

B. The replacement of surfaces at any time, as scheduled or as directed, shall not relieve the Contractor of responsibility to repair damages by settlement or other failures.

3.02 TEMPORARY PAVEMENT

A. Immediately upon completion of refilling of the trench or excavation, the Contractor shall place a temporary pavement over all disturbed areas of streets, driveways, sidewalks, and other traveled places where the original surface has been disturbed as a result of his operations.

B. Unless otherwise specified or directed the temporary pavement shall consist of compacted run-of-crusher limestone to such a depth as required to withstand the traffic to which it will be subjected.

C. Where concrete pavements are removed, the temporary pavement shall be surfaced with "cold patch". The surface of the temporary pavement shall conform to the slope and grade of the area being restored.

D. For dust prevention, the Contractor shall treat all surfaces, not covered with cold patch, as frequently as may be required.

E. The temporary pavement shall be maintained by the Contractor in a safe and satisfactory condition until such time as the permanent paving is completed. The Contractor shall immediately remove and restore all pavement as shall become unsatisfactory.

3.03 PERMANENT PAVEMENT REPLACEMENT

A. The permanent and final repaving of all streets, driveways and similar surfaces where pavement has been removed, disturbed, settled or damaged by or as a result of performance of the Contract shall be repaired and replaced by the Contractor, by a new and similar pavement.

1. The top surface shall conform with the grade of existing adjacent pavement and the entire replacement shall meet the current specifications of the local community for the particular types of pavement.

2. Where the local community has no specification for the type of pavement, the work shall be done in conformity with the State Department of Transportation Standard which conforms the closest to the type of surfacing being replaced, as determined by the Engineer.

3.04 PREPARATION FOR PERMANENT PAVEMENT

A. When scheduled and within the time specified, the temporary pavement shall be removed and a base prepared, at the depth required by the local community or Highway Permit, to receive the permanent pavement.

1. The base shall be brought to the required grade and cross-section and thoroughly compacted before placing the permanent pavement.

2. Any base material which has become unstable for any reason shall be removed and replaced with compacted base materials.

B. Prior to placing the permanent pavement all service boxes, manhole frames and covers and similar structures within the area shall be adjusted to the established grade and cross-section.

C. The edges of existing asphalt pavement shall be cut a minimum of 1 foot beyond the excavation or disturbed base whichever is greater.

1. All cuts shall be parallel or perpendicular to the centerline of the street.

3.05 ASPHALT PAVEMENT

A. The permanent asphalt pavement replacement for streets, driveways and parking area surfaces shall be replaced with bituminous materials of the same depth and kind as the existing unless otherwise specified.

B. Prior to placing of any bituminous pavement a sealer shall be applied to the edges of the existing pavement and other features.

C. The furnishing, handling and compaction of all bituminous materials shall be in accordance with the State Department of Transportation Standards.

3.06 CONCRETE PAVEMENT AND PAVEMENT BASE

A. Concrete pavements and concrete bases for asphalt, brick or other pavement surfaces shall be replaced with Class "B" Concrete, air-entrained.

B. Paving slabs or concrete bases shall be constructed to extend 1 foot beyond each side of the trench and be supported on undisturbed soil. Where such extension of the pavement will leave less than 2 feet of original pavement slab or base, the repair of the pavement slab or base shall be extended to replace the slab to the original edge of the pavement or base unless otherwise indicated on the Contract Drawings.

C. Where the edge of the pavement slab or concrete base slab falls within the excavation, the excavation shall be backfilled with Special Backfill compacted to 95% maximum dry density as determined by ASTM D 698 up to the base of the concrete.

D. The new concrete shall be of the same thickness as the slab being replaced and shall contain reinforcement equal to the old pavement.

1. New concrete shall be placed and cured in accordance with the applicable provisions of the State Department of Transportation Standards.

3.07 STONE OR GRAVEL PAVEMENT

A. All pavement and other areas surfaced with stone or gravel shall be replaced with material to match the existing surface unless otherwise specified.

1. The depth of the stone or gravel shall be at least equal to the existing.

2. After compaction the surface shall conform to the slope and grade of the area being replaced.

3.08 CONCRETE WALKS, CURBS AND GUTTER REPLACEMENT

A. Concrete walks, curbs and gutters removed or damaged in connection with or as a result of the construction operations shall be replaced with new construction.

1. The minimum replacement will be a flag or block of sidewalk and 5 feet of curb or gutter.

B. Walks shall be constructed of Class "B" concrete, air-entrained with KY-DOT #2 stone aggregate on a 4-inch base of compacted gravel or stone.

1. The walk shall be not less than 4 inches in thickness or the thickness of the replaced walk where greater than 4 inches, shall have construction joints spaced not more than 25 feet apart, shall have expansion joints spaced not more than 50

feet apart and shall be sloped at right angles to the longitudinal centerline approximately inch per foot of width.

C. 1/2-inch expansion joint material shall be placed around all objects within the sidewalk area as well as objects to which the new concrete will abut, such as valve boxes, manhole frames, curbs, buildings and others.

D. Walks shall be hand-floated and broom-finished, edged and grooved at construction joints and at intermediate intervals matching those intervals of the walk being replaced.

1. The intermediate grooves shall be scored a minimum of 1/4 of the depth of the walk.

2. The lengths of blocks formed by the grooving tool, and distances between construction and expansion joints shall be uniform throughout the length of the walk in any one location.

E. The minimum length of curb or gutter to be left in place or replaced shall be 5 feet. Where a full section is not being replaced, the existing curb or gutter shall be saw cut to provide a true edge.

1. The restored curb or gutter shall be the same shape, thickness and finish as being replaced and shall be built of the same concrete and have construction and expansion joints as stated above for sidewalks.

F. All concrete shall be placed and cured as specified in the Section for concrete.

3.09 LAWNS AND IMPROVED AREAS

A. The area to receive topsoil shall be graded to a depth of not less than 4 inches or as specified, below the proposed finished surface.

1. If the depth of existing topsoil prior to construction was greater than 4 inches, topsoil shall be replaced to that depth.

B. The furnishing and placing of topsoil, seed and mulch shall be in accordance with the Section entitled "Topsoil and Seeding".

C. When required to obtain germination, the seeded areas shall be watered in such a manner as to prevent washing out of the seed.

D. Any washout or damage which occurs shall be regraded and reseeded until a good sod is established.

E. The Contractor shall maintain the newly seeded areas, including regrading, reseeding, watering and mowing, in good condition.

3.10 CULTIVATED AREA REPLACEMENT

A. Areas of cultivated lands shall be graded to a depth to receive topsoil of not less than the depth of the topsoil before being disturbed. All debris and inorganic material shall be removed prior to the placing of the topsoil.

B. The furnishing and placing of topsoil shall be in accordance with the Section entitled "Topsoil and Seeding".

C. After the topsoil has been placed and graded, the entire area disturbed during construction shall be cultivated to a minimum depth of 12-inches with normal farm equipment.

1. Any debris or inorganic materials appearing shall be removed.

2. The removal of stones shall be governed by the adjacent undisturbed cultivated area.

D. Grass areas shall be reseeded using a mixture equal to that of the area before being disturbed, unless otherwise specified.

3.11 OTHER TYPES OF RESTORATION

A. Trees, shrubs and landscape items damaged or destroyed as a result of the construction operations shall be replaced in like species and size.

1. All planting and care thereof shall meet the standards of the American Association of Nurserymen.

B. Water courses shall be reshaped to the original grade and cross-section and all debris removed. Where required to prevent erosion, the bottom and sides of the water course shall be protected.

C. Culverts destroyed or removed as a result of the construction operations shall be replaced in like size and material and shall be replaced at the original location and grade. When there is minor damage to a culvert and with the consent of the Engineer, a repair may be undertaken, if satisfactory results can be obtained.

D. Should brick pavements be encountered in the work, the restoration shall be as set forth in the Special Provisions or as directed.

3.12 MAINTENANCE

A. The finished products of restoration shall be maintained in an acceptable condition for and during a period of one year following the date of Substantial Completion or other such date as set forth elsewhere in the Contract Documents.

-END OF SECTION-

SECTION 02830

CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The Contractor shall furnish and erect the chain link fence and gates as indicated on the drawings and as herein specified.

B. The chain link fence shall have a top rail and bottom tension wire.

C. The chain link fence materials and installation shall meet or exceed the standards of the Chain Link Fence Manufacturers Institute, New York, N.Y., except as otherwise specified in this section; also fence materials shall meet or exceed Fed. Spec. RR-F-191H/GEN for Fencing, Wire and Post Metal (and Gates, Chain Link Fence Fabric, and Accessories), and shall conform to the ASTM Standard Specifications hereinafter noted.

D. Fence framework, fabric, and accessories.

E. Excavation for post bases.

F. Concrete anchorage for posts.

G. Manual gates and related hardware.

1.02 REFERENCES

A. ANSI/ASTM A123 - Zinc (Hot Galvanized) Coatings of Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars and Strips.

B. ANSI/ASTM F567 - Installation of Chain Link Fence.

C. ASTM A120 - Pipe, Steel, Black and Hot-dipped Zinc-coated (Galvanized) Welded and Seamless, for Ordinary Uses.

D. ASTM C94 - Ready-mixed Concrete.

E. FS RR-F-191 - Fencing, Wire and Post, Metal, Type I or Type II.

1.03 QUALITY ASSURANCE

A. Manufacturer: Company specializing in commercial quality chain link fencing with 2 years experience.

B. Installation: ANSI/ASTM F567.

1.04 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01300.

B. Include plan layout, grid, spacing of components, accessories, fittings, hardware, anchorages, and schedule of components.

C. Submit manufacturer's installation instructions under provisions of Section 01300.

D. Submit samples under provisions of Section 01300.

E. Submit the following samples illustrating each fence material and fabric finish.

1. A 2" length of each type of post.
2. A 2" length of each type of brace and railing.
3. A 2" length of framework for gates.
4. A 2" length of diagonal truss brace.
5. A 2" length of tension wire.
6. Each type of fitting used at terminal posts.
7. Fittings used at line posts.
8. Fittings for the gate leaf frame.
9. Gate hinge.
10. Gate latch.
11. Stretcher bar, 2" length.
12. Bolt and nut fastener.
13. Fence fabric, 2 weaves, 2 meshes long.
14. Tie.

F. Accompanying the samples, the Contractor shall submit two statements, one on his and one on his subcontractor's letterhead that the samples submitted comply with the requirements of these Contract Documents. Samples shall be submitted for review at least 30 days before fence erection.

PART 2 - PRODUCTS

2.01 MATERIALS

Framework: ASTM A120; Schedule 40 steel pipe, standard weight, one piece without joints.

2.02 CONCRETE MIX

A. Concrete: ASTM C94; Portland Cement; 2500 min. psi at 38 days; 3" slump/1" maximum sized aggregate.

2.03 MATERIALS

A. Type I metal fittings, posts, fence and gate framework, and all accessories shall be galvanized with a heavy coating of 1.8 oz. pure zinc spelter per sq. ft. of surface area to be coated using the hot-dip process. Type II shall be triple coated with 102 zinc, 15 MG of chromate and .3 mils cross link polyurethane.

B. All fabrication and welding shall be done before hot-dip galvanizing. All welding shall conform to the American Welding Society standards.

C. The chain link fence fabric shall be galvanized steel chain link fabric conforming to ASTM Standard Specification for Zinc-Coated Steel Chain Link Fence Fabric, Designation A392-74, with Class 2 zinc coating (2.0 oz. of zinc per sq. ft. of uncoated wire surface). The fabric shall be woven in 2" mesh from No. 9 gauge wire in a 6-foot width with barbed selvages top and bottom.

D. The barbed wire shall be galvanized steel barbed wire consisting of two strands of twisted No. 12 1/2-gage wires with 4-point barbs spaced 3" apart and conforming to ASTM Standard Specification of Zinc-Coated (Galvanized) Steel Barbed Wire, Designation A121-77, with Class 3 zinc coating (minimum of 0.80 oz. of zinc per sq. ft. of uncoated wire surface for No. 12 1/2-gauge wire).

E. The tension wire shall be No. 7-gauge coil spring steel wire with galvanized finish having minimum of 0.80 oz. of zinc coating per sq. ft. of uncoated wire surface.

F. Tie wires for fastening fence fabric to line posts and rails shall be not less than No. 6 gauge aluminum wire.

G. Line posts shall be 2-3/8" (2.375") outside diameter steel pipe weighing not less than 3.65 lb. per ft. for Type I or 3.117 lb. per ft. for Type II, or 1-7/8" high carbon steel H-beams weighing not less than 2.70 lb. per ft.

H. End, corner, and pull posts shall be 2-7/8" (2.875) outside diameter steel pipe weighing not less than 5.79 lb. per ft. for Type I or 4.64 lb. per ft. for Type II, or 2 1/2" square steel tube weighing not less than 5.14 lb. per ft., or 3 1/2" by 3 1/2 roll-formed, steel corner section weighing not less than 5.14 lb. per ft.

I. Gate posts for gate leaves up to and including 6 ft., wide shall be 2-7/8" outside diameter steel pipe weighing not less than 5.79 lb. per ft., or 2 1/2" square steel tube weighing not less than 5.14 lb. per ft., or 3 1/2" by 3 1/2" roll-formed, steel corner section weighing not less than 5.14 lb. per ft.

J. Gate posts for gate leaves over 6 ft. wide and up to an including 13 ft. wide shall be 4" outside diameter steel pipe weighing not less than 9.10 lb. per ft. for Type I or 3 1/2" Type II at 5.71 lb. per ft.

K. Top railings and railings for top, middle and bottom braces between terminal posts and adjacent line posts shall be 1-5/8" outside diameter steel pipe weighing not less than 2.27 lb. per ft., or 1-5/8" by 1 1/4", 14- gauge roll-form section.

L. Diagonal truss braces between terminal and adjacent line posts and for gate framework shall be 3/8" diameter steel rod.

M. Barbed wire support arms shall project outward from the top of the posts at 45 degrees and shall be capable of withstanding a 200 lb. downward pull on the outermost end of the arm, without failure. The arms shall have provision for the attachment of three strands of evenly spaced barbed wire. Arms shall be integral with post top weather caps having holes for the passage of the top rail at intermediate posts.

N. Fittings shall be heavy duty malleable iron or pressed steel of suitable size to produce strong construction.

O. Stretcher bars for attaching fabric to terminal posts such as end, corner, pull, or gate posts and gate frames shall be flat bars with minimum cross-section dimensions of not less than 1/4" by 3/4". The stretcher bars shall be the full height of the fabric and shall be secured with bar bands of not less than 11-gauge sheet steel, spaced approximately 15" on centers and bolted with 3/8" diameter bolts.

P. Gate leave framework shall be 1-7/8" outside diameter steel pipe weighing not less than 2.72 lb. per ft. for Type I or 2.28 lb. per ft. for Type II.

Q. If bolted or riveted corner fittings are not used, the gate frame shall be hot-dip galvanized after welding.

R. Gate hinges shall be of heavy pattern of adequate strength for the gate size, with large bearing surfaces for clamping or bolting in position.

S. The gates shall be provided with a suitable latch accessible from both sides and with provision for padlocking.

T. Double leaf swing gates shall have a center bolt, center stop, and automatic backstops to hold leaves in open position.

U. Gate padlocks shall have solid brass cases, hardened steel shackles, removable core cylinders, and galvanized steel chains attached to the shackle by a clevis. Padlocks shall be manufactured by Eaton Corp. Lock & Hardware Div., of Emhart Corp., Berlin, Conn.; Best Universal Lock Co., Inc., Indianapolis, Ind.; or be an acceptable equivalent product. The padlocks shall be furnished with two keys each.

2.04 FINISHES

A. Galvanized: ANSI/ASTM A120; 1.8 oz./sq. ft. coating.

B. Accessories: Same finish as framing and fabric.

PART 3 - EXECUTION

3.01 INSTALLATION - ERECTION OF CHAIN LINK FENCE

A. The fence and gates shall be erected by skilled mechanics.

B. Post spacing shall be uniform with maximum spacing of 10 ft. in fences erected along straight lines. All posts shall be placed plumb and centered in the concrete foundations.

C. Post foundations in earth shall be concrete cylinders with a minimum diameter of 12", crowned at grade to shed water, and shall not be less than 36" deep in the ground. Posts shall be set in the full depth of the foundations except for 6" of concrete under the posts.

D. If foundation holes are excavated in peat or other unstable soil, the Engineer shall be notified for determination of suitable construction precautions.

E. If solid ledge is encountered without overburden of soil, posts shall be set into the rock a minimum depth of 12" for line posts and 18" for terminal posts. Post holes shall be at least 1" greater in diameter than the post and the grout shall be thoroughly worked into the hole so as not to leave voids, and shall be crowned at the top to shed water. Where solid rock is covered by an overburden, the total setting depths shall not exceed the depths required for setting in earth, and the posts shall be grouted into the rock as described.

F. Any change in direction of the fence line of 30 degrees or more shall be considered corners. Pull posts shall be used at any abrupt change in grade.

G. Maximum area of unbraced fence shall not exceed 1,500 square feet.

H. Terminal posts shall be braced to adjacent posts with horizontal brace rails and diagonal truss rods brought to proper tension so that posts are plumb.

I. There shall be no loose connections or sloppy fits in the fence framework. The fence framework shall withstand all wind and other forces due to the weather.

J. Fabric shall be stretched taut and tied to posts, rails and tension wires with the bottom edge following the finished grade not more than 2" above the grade. The fabric shall be installed on the security side of the fence and shall be anchored to the framework so that the fabric remains in tension after pulling force is released. The fabric shall be attached to line posts with ties spaced at not more than 15" intervals and to rails and braces at not more than 24" intervals. The fabric shall be attached to the tension wire with hog ring ties on 24" centers.

K. Three strands of barbed wire shall be installed on each extension arm of the line fence and at the top of each gate. The wires shall be pulled taut and fastened at each support.

L. Gates shall be installed plumb, level, and secure for the full width of the opening and the hardware adjusted for smooth operation. Provide concrete center drop to foundation depth and drop rod retainers at center of double gate openings.

- END OF SECTION -

SECTION 02936

SEEDING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Preparation of subgrade to receive topsoil.

B. Spreading topsoil.

C. Seeding and fertilizing.

D. Seed protection on slopes.

E. Hydroseeding.

F. Maintaining seeded areas until acceptance.

1.02 RELATED WORK

Section 01450 - Quality Control.

1.03 QUALITY ASSURANCE

Test top soil under provisions of Section 01450.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver grass seed in original containers showing analysis of seed mixture, percentage of pure seed, year of production, new weight, date of packaging and location of packaging. Damaged packages are not acceptable.

B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.05 EXISTING CONDITIONS

Beginning work of this Section means acceptance of existing conditions.

PART 2 - PRODUCTS

2.01 GROWING MEDIA

A. Existing Topsoil: Natural, fertile agricultural soil capable of sustaining vigorous plant growth, not in frozen or muddy condition, containing not less than 6 percent organic matter, and corrected to pH value of 5.9 to 7.0. Free from subsoil, slag, clay, stones, lumps, live plants, roots, sticks, crabgrass, couchgrass, noxious weeds, and foreign matter.

B. Fertilizer: 10-10-10 commercial type with 50 percent of the elements derived from organic sources.

2.02 SEED

Seed shall be proportioned by weight as follows: Kentucky 31 Fescue, 60%; Creeping Red Fescue, 20%, Annual Rye Grass, 20%.

2.03 ACCESSORIES

A. Mulching Material: Straw from oat, wheat, rye or barley, reasonably free from seeds, foreign matter detrimental to plant life, and in dry condition.

B. Mulching Material: Wood or wood cellulose fiber free of growth or germination inhibiting ingredients.

C. Establishment Blanket: Uniform, open weave jute matting.

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect existing underground improvements from damage.

B. Remove foreign materials, plants, roots, stones, and debris, from site. Do not bury foreign material.

C. Remove contaminated subsoil.

D. Cultivate to depth of 3 inches, area to receive topsoil. Repeat cultivation areas where equipment has compacted subgrade.

3.02 SPREADING TOPSOIL

A. Spread topsoil to depth of 6 inches over area to be seeded. Place during dry weather, and on dry unfrozen subgrade.

B. Cultivate topsoil to depth of 6 inches with mechanical tiller. Cultivate inaccessible areas by hand. Rake until surface is smooth.

C. Remove from site, foreign materials collected during cultivation.

D. Grade to eliminate rough spots and low areas where ponding may occur. Maintain smooth, uniform grade.

E. Assure positive drainage away from buildings.

F. Finish ground level firm and sufficient to prevent sinkage pockets when irrigation is applied.

3.03 FERTILIZING

A. Apply fertilizer, at a rate of 15 lbs. per 1,000 sq. ft.

B. Do not apply grass seed and fertilizer at same time in same machine.

C. Lightly water to aid breakdown of fertilizer and to provide moist soil for seed.

3.04 SEED

A. Apply seed at a rate of 6 lbs. per 1,000 sq. ft. evenly in two intersecting directions. Rake in lightly.

B. Do not sow immediately following rain, when ground is too dry, or during windy periods.

C. Roll seeded area with roller not exceeding 112 lbs.

D. Apply water with fine spray immediately after each area has been sown.

E. Seed shall be sown from March 15 to April 15 or from August 25 to September 25.

3.05 HYDROSEEDING

A. Apply slurry at rate of 6 lbs., per 1,000 sq. ft. evenly in two intersecting direction and with hydraulic seeder.

B. Immediately following hydroseeding, mulch areas by means of mulch blower at rate of 1,200 pounds per acre on level grades, 2,000 lbs. on slopes.

C. Do not seed area in excess of that which can be mulched on the same day.

3.06 SEED PROTECTION ON SLOPES

A. Cover seeded slopes where grade is 3:1 or greater with jute matting. Roll matting down over slopes without stretching or pulling.

B. Lay matting smoothly on soil surface, boring top end of each section in narrow 6-inch trench. Leave 12-inch overlap from top roll over bottom roll. Leave 4-inch overlap over adjacent section.

C. Staple outside edges and overlaps at 36-inch intervals.

D. Lightly dress slopes with topsoil to ensure close contact between matting and soil.

E. In ditches, unroll matting in direction of flow. Overlap ends of strips 6 inches with upstream section on top.

3.07 MAINTENANCE PERIOD

Maintenance Period: Until final acceptance.

3.08 MAINTENANCE

A. Maintain surfaces and supply additional topsoil where necessary, including areas affected by erosion.

B. Water to ensure uniform seed germination and to keep surface of soil damp.

C. Apply water slowly so that surface of soil will not puddle and crust.

D. Cut grass first time when it reaches height of 2-1/2 inches (60 mm) and maintain to minimum height of 2 inches. Do not cut more than 1/3 of blade at any one mowing. Remove clippings.

E. After first mowing, water grass sufficiently to moisten soil from 3 inches to 5 inches (76 to 127 mm) deep.

F. Apply approved weed killer when weeds start developing during calm weather when air temperature is above 50 degrees F.

G. Replant damaged grass areas showing root growth failure, deterioration, bare or thin spots, and eroded areas.

3.09 RESTORATION

Restore grassed areas damaged during execution of work of this Section.

3.10 ACCEPTANCE

Seeded areas will be accepted at end of maintenance period when seeded areas are properly established and otherwise acceptable.

- END OF SECTION -

DIVISION 3

CONCRETE

B. Glass fiber fabric reinforced plastic forms; matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to structural tolerances and appearance of finished concrete surface.

2.02 FORMWORK ACCESSORIES

A. Form Ties: Snap-off metal of fixed length; cone-typed; 1" break back dimension; free of defects that will leave holes no larger than 1" in diameter in concrete surface, with waterproofing washer.

B. Form Release Agent: Colorless material which will not stain concrete, absorb moisture or impair natural bonding or color characteristics of coating intended for use on concrete. Form oil shall be placed prior to reinforced steel when possible and surplus oil on form surfaces or reinforcing steel shall be removed.

C. Fillets for Chamfered Corners: Wood strip type to the size and shape as shown on the Drawings.

D. Nails, spikes, lag bolts, through bolts, anchorages: Sized as required of strength and character to maintain formwork in place while placing concrete.

PART 3 - EXECUTION

3.01 INSPECTION

Verify lines, levels and measurements before proceeding with formwork.

3.02 PREPARATION

Earth or rock forms not permitted.

3.03 ERECTION

A. Provide bracing to ensure stability of formwork. Strengthen formwork liable to be overstressed by construction loads.

B. Provide temporary ports in formwork to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain. Close ports with tight fitting panels, flush with inside face of forms, neatly fitted so that joints will not be apparent in exposed concrete surfaces.

C. Provide chamfer strips on external corners of all surfaces so indicated on the Drawings. Unless otherwise noted, chamfer strips shall be 1" radius with leg, polyvinyl chloride strips by Gateway Building Products, SAF-T-Grip Specialties Corp., Vinylex Corp., or equal.

D. Concrete surfaces not exposed to view shall be formed with sound tight lumber or other material producing equivalent finish.

E. Concrete surfaces to be exposed to view shall be formed with material that is not reactive with concrete surfaces and shall be equivalent in smoothness and appearance to that produced by new plywood panels conforming to PS 1, exterior type Grade B-B.

F. Particular attention is directed to the requirements of paragraphs 10.2.2 and 13.3 of ACI 301. Form panels shall be provided in the maximum sizes practicable in order to minimize form joints. Wherever practicable, form joints shall occur at recessed joints. All form joints in exterior exposed to view surfaces shall be carefully caulked with an approved nonstaining caulking compound. Joints shall not be taped. Form oil or other material which will impart a stain to the concrete shall not be allowed to contact concrete surfaces.

G. Form ties shall remain in the walls and shall be equipped with a waterseal to prevent passage of water through the walls. Particular care shall be taken to bend tie wire ends away from exposed faces of beams, slabs and columns. In no case shall ends of tie wire project toward or touch formwork. Minimum set back of form ties shall be 1-1/2-inch from faces of wall. The hole left by removal of tie ends shall be sealed and grouted as per ACI Par. 9.3 and in accordance with the procedure described hereinafter in Section 03300 paragraph 3.01 B. Form ties will be permitted to fall within as-cast areas of architecturally treated wall surfaces (ACI Chapter 13).

3.04 APPLICATION OF RELEASE AGENT

Apply form release agent on formwork in accordance with manufacturer's instructions. Apply prior to placing reinforcing steel, anchoring devices, and embedded items. Form boards shall not be wet with water prior to placing concrete.

3.05 INSERTS, EMBEDDED PARTS, AND OPENINGS

A. Provide formed openings where required for work embedded in or passing through concrete.

B. Coordinate work of other sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.

C. Install accessories in accordance with manufacturer's instructions, level and plumb. Ensure items are not disturbed during concrete placement.

3.07 FORM REMOVAL

A. Do not remove forms and bracing until concrete has sufficient strength to support its own weight, and construction and design loads which may be imposed upon it. Remove load supporting forms when concrete has attained 75 percent of required 28-day compressive strength, provided construction is reshored immediately, and the shoring remains until the concrete attains its 28 day compressive strength.

B. Do not damage concrete surfaces during form removal.

3.08 CLEANING

A. Clean forms to remove foreign matter as erection proceeds.

B. Ensure that water and debris drain to exterior through clean out ports.

C. During cold weather, remove ice and snow from forms. Do not use deicing salts. Do not use water to clean out completed forms, unless formwork and construction proceed within heated enclosure. Use compressed air to remove foreign matter.

- END OF SECTION -

SECTION 03210

REINFORCING STEEL

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Reinforcing steel.

B. Shop Drawings.

1.02 RELATED WORK

A. Section 03100 - Concrete Formwork.

B. Section 03300 - Cast-in-Place Concrete.

1.03 REFERENCES

A. ASTM A-615

B. ASTM A-616

C. ASTM A-617

D. ACI 351

E. ASTM A-120

F. ASTM A-185

1.04 SUBMITTALS

Shop Drawings: The Contractor shall submit a complete set of shop drawings including schedules and bending drawings for all reinforcement used in the work in accordance with the "Manual of Standard Practice for Detailing Concrete Structures" (ACI 351). Approval of drawings by the Engineer is required before shipment can be made.

PART 2 - PRODUCTS

2.01 MATERIALS

A. The minimum yield strength of the reinforcement shall be 60,000 pounds per square inch. Bar reinforcement shall conform to the requirements of ASTM A-615, A-616, or A-617. All bar reinforcement shall be deformed.

B. Smooth dowels shall be plain steel bars conforming to ASTM A-615, Grade 40, or steel pipe conforming to ASTM A-120, Schedule 80. Pipe, if used, shall be closed flush at each end with mortar or metal or plastic cap.

C. Welded wire fabric shall conform to ASTM 185, welded steel wire fabric for concrete reinforcement.

D. Reinforcement supports and other accessories in contact with the forms for members which will be exposed to view in the finished work shall have approved high density polyethylene tips so that the metal portion shall be at least one quarter of an inch from the form or surface. Supports for reinforcement, when in contact with the ground or stone fill, shall be precast stone concrete blocks. Particular attention is directed to the requirements of paragraph 5.5.3 of ACI Standard 301. These requirements apply to all reinforcement, whether in walls or other vertical elements, inclined elements or flatwork.

2.02 FABRICATION

A. Reinforcement shall be bent cold. It shall be bent accurately to the dimensions and shapes shown on the plans and to within tolerances specified in the CRSI Manual of Standard Practice.

B. Reinforcing shall be shipped with bars of the same size and shape, fastened securely with wire and with metal identification tags using size and mark.

PART 3 - EXECUTION

3.01 PLACING AND FASTENING

A. Before being placed in position, reinforcement shall be cleaned of loose mill and rust scale, dirt and other coatings that will interfere with development of proper bond.

B. Reinforcement shall be accurately placed in positions shown on the drawings and firmly held in place during placement and hardening of concrete by using annealed wire ties. Bars shall be tied as required to prevent displacement under foot traffic and during casting operations, and shall be placed within tolerances allowed in Section 5.6.2 of ACI 301.

C. Distance from the forms shall be maintained by means of stays, blocks, ties, hangers or other approved supports. (See paragraph 2.01 D) If fabric reinforcement is shipped in rolls, it shall be straightened into flat sheets before being placed.

D. Before any concrete is placed, the Engineer shall have inspected the placing of the steel reinforcement and given permission to deposit the concrete. Concrete placed in violation of this provision will be rejected and thereupon shall be removed.

E. Unless otherwise specified, reinforcement shall be furnished in the full lengths indicated on the plans. Splicing of bars, except where shown on the plans, will not be permitted without the approval of the Engineer. Where splices are made, they shall be staggered insofar as possible.

F. Wire mesh reinforcement shall be continuous between expansion joints. Laps shall be at least one full mesh plus 2", staggered to avoid continuous lap in either direction and securely wired or clipped with standard clips.

G. Dowels shall be installed at right angles to construction joints and expansion joints. Dowels shall be accurately aligned parallel to the finished surface, and shall be rigidly held in place and supported during placing of the concrete. One end of dowels shall be oiled or greased or dowels shall be coated with high density polyethylene with a minimum thickness of 14 mils.

- END OF SECTION -

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 WORK INCLUDED

The work in this section shall include all formwork, shoring, bracing, anchorage, concrete reinforcement and accessories for cast-in-place concrete.

1.02 GENERAL REQUIREMENT

All concrete construction shall conform to all applicable requirements of ACI 301-84 Specifications for Structural Concrete for Buildings, except as modified by the supplemental requirements specified herein.

1.03 RELATED WORK

Section 05500 - Miscellaneous Metals.

1.04 REFERENCES

A. The Contractor shall obtain and have available in the field office at all times, the following references:

1. Specifications for Structural Concrete for Buildings ACI 301-84 (latest revision).
2. Field Reference Manual SP-15 (81).
3. Manual of Standard Practice - CRSI (latest revision).
4. Placing Reinforcing Bars - CRSI (latest revision).
5. Building Code Requirements for Reinforced Concrete ACI 318 (latest revision).

B. The following standard shall also apply to this work:

1. ASTM C-143
2. ASTM C-150
3. ASTM C-33
4. ASTM C-260
5. ASTM C-494
6. ASTM A-615
7. ASTM D-638
8. ASTM D-695
9. ASTM D-570
10. ASTM D-1252
11. ANSI A-116.1
12. ASTM A-120
13. ASTM C-94
14. ASTM D-2146
15. Federal Specifications FF-S~325

1.05 SUBMITTALS

A. The Contractor shall submit the following data to the Engineer for review:

1. Concrete mix designs, test results and curves plotted to establish water-cement ratio if Method 1 of ACI 301 is used.

2. Proposed mix designs and all necessary substantiating data used to establish proposed mix designs if Method 2 of ACI 301 is used.

3. Mix designs for all mixes proposed or required to be used, including all mixes containing admixtures.

4. A certified copy of the control records of the proposed production facility establishing the standard deviation as defined in Paragraph 3.8.2.3 of ACI 301.

B. Certification attesting that admixtures equal or exceeds the physical requirements of ASTM C-494 for Type A admixture and, when required, for Type D admixture.

C. Drawings showing locations of all proposed construction joints.

D. Shop drawing for reinforcing steel showing bar schedules, location, and splices.

PART 2 - PRODUCTS

2.01 CLASSES OF CONCRETE AND USAGE

A. Structural concrete of the various classes required shall be proportioned by either Method 1 or 2 of ACI 301 to produce the following 28-day compressive strengths:

1. Selection of Proportions for Class A Concrete:

   a. 4,000 psi compressive for strength at 28 days.

   b. Type I cement plus dispersing agent and air.

   c. Maximum (water)/(cement and dispersing agent) ratio 0.50.

   d. Minimum cement content = 564 lbs. (6.0 bags)/cu. yd. concrete.

   e. Nominal maximum size coarse aggregate = No. 67 (3/411 maximum) or No. 57 (111 maximum). Walls with architectural treatment shall use No. 67 (3/411 maximum).

   f. Air content = 5% plus or minus 1% by volume.

   g. Slump = 211-311 in accordance with ASTM C-143.

2. Selection of Proportions for Class B Concrete:

   a. 3,000 psi compressive strength at 28 days.

b. Type I cement plus dispersing agent and air.

c. Maximum (water)/(cement and dispersing agent) ratio 0.56.

d. Minimum cement content = 470 lbs. (5.0 bags)/cu. yd. concrete.

e. Nominal maximum size coarse aggregate = No. 67 (3/4" maximum) or No. 57 (1 1/2" maximum).

f. Air content = 6% plus or minus 1% by volume.

g. Slump - 3 1/2-4 1/2 in accordance with ASTM C-143.

B. Concrete shall be used as follows:

1. Class A concrete for all concrete work except as noted below.

2. Class B concrete for fill concrete and thrust blocks, and where indicated on the Drawings.

C. All testing shall be or have been performed by a recognized independent testing laboratory.

D. Cement for exposed concrete shall have a uniform color classification.

E. Coarse aggregate shall conform to all requirements of ASTM C-33.

F. Manufactured sand shall not be used as fine aggregate in concrete.

2.02 ADMIXTURES

A. An air entraining admixture shall be used on all concrete and shall be the neutralized vinsol resin type such as Master Builders MB-VR, or Euclid Chemical Co. AIR-MIX or equal. The admixture shall meet the requirements of ASTM C-260. Certification attesting to the percent of effective solids and compliance of the material with ASTM C-260 shall be furnished, if requested.

B. A water-reducing, set controlling admixture (non-lignin type) shall be used in all concrete. The admixture shall be a combination of polyhydroxylated polymers including catalysts and components to produce the required setting time based on job site conditions, specified early strength development, finishing characteristics required, and surface texture, as determined by the Engineer.

C. Certification shall be furnished attesting that the admixture exceeds the physical requirements of ASTM C-494, Type A, water-reducing and normal setting admixture, and when required, for ASTM C-494, Type D, water-reducing and retarding admixture when used with local materials with which the subject concrete is composed.

D. The admixture manufacturer, when requested, shall provide a qualified concrete technician employed by the manufacturer to assist in proportioning concrete for optimum use. He shall also be available when requested to advise on proper addition of the admixture to the concrete and on adjustment of the concrete mix proportions to meet changing job conditions.

E. The use of admixtures to retard setting of the concrete during hot weather, to accelerate setting during cold weather, and to reduce water content without impairing workability will be permitted if the following conditions are met:

The admixture shall conform to ASTM C-494 except that the durability factor for concrete containing the admixture shall be at least 100 percent of control, the water content a maximum of 90 percent of control and length change shall not be greater than control, as defined in ASTM C-494.

F. Where the Contractor finds it impractical to employ fully the recommended procedures for hot weather concreting, the Engineer may at his discretion require the use of a set retardant admixture for mass concrete 2.5 feet or more thick and for all concrete whenever the temperature at the time concrete is cast exceeds 80-F. The admixture shall be selected by the Contractor subject to the review of the Engineer. The admixture and concrete containing the admixture shall meet all the requirements of these Specifications. Preliminary tests of this concrete shall be required at the Contractor's expense.

G. Admixtures shall be used in concrete design mixes in the same manner and proportions as in the field so that the effects of the admixtures are included in preliminary tests submitted to the Engineer for review prior to the start of construction.

H. When more than one admixture is used, all admixtures shall be compatible. They should preferably be by the same manufacturer.

I. Calcium chloride will not be permitted as an admixture in any concrete.

2.03 REINFORCEMENT

A. The minimum yield strength of the reinforcement shall be 60,000 pounds per square inch. Bar reinforcement shall conform to the requirements of ASTM A-615. All bar reinforcement shall be deformed.

B. Smooth dowels shall be plain steel bars conforming to ASTM A-615, Grade 60, or steel pipe conforming to ASTM A-120, Schedule 80. Pipe, if used, shall be closed flush at each end with mortar or metal or plastic cap.

C. Reinforcement supports and other -accessories in contact with the forms for members which will be exposed to view in the finished work shall be of stainless steel or shall have approved high-density polyethylene tips so that the metal portion shall be at least one-quarter of an inch from the form or surface. Supports for reinforcement, when in contact with the ground or stone fill, shall be precast stone concrete blocks. Particular attention is directed to the requirements of Paragraph 5.5.3 of ACI Standard 301. These requirements apply to all reinforcement, whether in walls or other vertical elements, inclined elements or flatwork.

2.04 OTHER MATERIALS

A. Anchorage items shall be of standard manufacture and of type required to engage with the anchors to be installed therein under other sections of the Specifications and shall be subject to approval by the Engineer.

1. Slots shall be galvanized dovetail-type as specified in Section "Masonry Work".

2. Inserts shall be malleable iron or steel and of sturdy design adequate strength for the load to be carried. All inserts shall be galvanized. Adjustable wedge inserts shall have an integral loop or strap at the back or shall be provided with lugs to take reinforcing bars. They shall be slotted to receive a special-headed bolt not smaller than 5/8-inch in diameter and of the required length and fitted with hexagonal nut. Other inserts shall be either threaded or slotted as required by their usage. Threaded inserts shall have integral lugs to prevent running.

3. Concrete anchors shall be an approved expansion type conforming to Federal Specification FF-S-325, Groups I, II, III, or VIII and shall be installed in strict accordance with the manufacturer's recommendations.

Material for anchors shall be as specified in Section 05500 - Miscellaneous Metals. Anchors shall develop ultimate shear and pull out loads of not less than the following values in Class A concrete:

BOLT DIAMETER (INCHES)	MINIMUM SHEAR (POUNDS)	MINIMUM PULL-OUT LOAD (POUNDS)
1/2	4,500	4,600
5/8	6,900	7,700
3/4	10,500	9,900

B. Epoxy bonding adhesive used to bond fresh plastic concrete to sound, hardened concrete shall meet the following specification. Contractor shall furnish a notarized certification by the manufacturer that the proposed material meets the specification.

1. Material:

The epoxy material shall consist of a 2-component system whose components conform to the following requirements:

a. Component A - Component A shall be a modified epoxy resin of the epichlorohydrin bisphenol A condensation type, containing suitable viscosity control agents and having an epoxide equivalent of 180-200.

b. Component B - The B component shall be primarily a reaction product of one mole of an aliphatic polyamine and two moles of mono functional epoxide containing compounds modified with 2, 4, 6 tri(dimethylaminomethyl) phenol.

c. The component ratio of B to A by volume shall be as specified by the manufacturer.

2. Properties of Mixed Components:

a.	Solids Content	100% by weight
b.	Pot Life	25-35 min. @ 73 degrees F
c.	Tack-Free Time (thin Film)	4-51/2 hrs @ 73 degrees F
d.	Final Cure ASTM D-695 (75% ultimate strength)	3 days at 73 degrees F
e.	Initial Viscosity (A+B)	2,000 cps. min at 73 degrees F
f.	Color Mixed	Straw

3. Properties of Cured Material (Neat Material):

a.	Tensile Strength ASTM D-638	3,000 psi min. @ 14 days, 73 degrees F
b.	Tensile Elongation	1/2-2% at 14 days,

	ASTM D-638, modified	73 degrees F cure
c.	Compressive Strength ASTM D-695	12,500 psi min. at 73 degrees F cure
d.	Compressive Modulus ASTM D-695	470,000 psi min. at 28 days, 73 degrees F cure
e.	Compressive Strength ASTM D-695	5,500 psi min. at 24 days, 73 degrees F cure
f.	Water Pick-up ASTM D-570	1.5 max.

C. Flashing reglets shall be as specified in Section 07530. Reglets shall be correctly placed into forms prior to placing concrete in formwork.

D. Premolded expansion-joint filler strips shall conform to ASTM D-1752 and shall be 3/8-inch thick unless otherwise shown.

E. Joint sealants shall conform to ANSI A116.1. The following joint sealants are acceptable:

1. Colma by Sika Chemical Corporation.

2. Hornflex by A.C. Horn, Inc.

3. Sonolastic by Sonneborn Division of Contech, Inc.

F. Nonshrink grout shall be Embeco 885 grout by Master Builders Company, Euco Firmix grout by the Euclid Chemical Company, or equal. The approved product shall be delivered to the site of the work in the original sealed containers, each bearing the trade name of the material and the name of the manufacturer.

G. Porous fill shall be crushed rock or gravel of such size that all will pass a 1-1/2 inch screen and not more than 5 percent will pass a No. 4 screen, free from earth, clay or other foreign substances.

PART 3 - EXECUTION

3.01 FINISHES

A. Exposed to Public View Concrete Surfaces:

1. All concrete exposed to view in the completed structure shall be produced using materials and workmanship to such quality that only nominal finishing will be required. The provisions of paragraphs 13.3, 13.4, and 13.6 of ACI 301 shall apply to all exterior exposed to public view concrete surfaces, including the outside surfaces of tanks.

2. Forms for exposed concrete surfaces shall be exterior grade, high-density overlay plywood, steel, or wood forms with smooth tempered hard-board form-liners.

3. Forms shall be coated with an approved release agent before initial pour and between subsequent pours, in accordance with the manufacturer's printed instructions. Form boards shall not be wet water prior to placing concrete.

4. Recessed joints in concrete shall be formed using lacquer-coated wood battens or forms, milled to indicated profiles. Battens and corner strips shall be carefully inspected before concrete is placed and damaged pieces replaced.

5. Chamfer strips shall be 1 inch radius with leg, polyvinyl chloride strips by Gateway Building Products, Saf-T-Grip Specialties Corp., Vinylex Corp., or equal.

6. Particular attention is directed to the requirements of paragraphs 10.2.2 and 13.3 of ACI 301. Form panels shall be provided in the maximum sizes practicable in order to minimize form joints. Wherever practicable, form joints shall occur at recessed joints. All form joints in exterior exposed to view surfaces shall be carefully caulked with an approved nonstaining caulking compound. Joints shall not be taped. Form oil or other material which will impart a stain to the concrete shall not be allowed to contact concrete surfaces.

7. Care shall be taken to prevent chipping of corners or other damage to concrete when forms are removed. Exposed corners and other surfaces which may be damaged by ensuing operations shall be protected from damage by boxing, corner boards or other approved means until construction is completed.

8. Form ties shall remain in the walls and shall be equipped with a waterseal to prevent passage of water through the walls. Particular care shall be taken to bend tie wire ends away from exposed faces of beams, slabs and columns. In no case shall ends of tie wires project toward or touch formwork. Minimum set back of form ties shall be 1-1/2-inch from faces of wall. The hole left by removal of tie ends shall be sealed and grouted as per ACI Para. 9.3 and in accordance with the procedure described hereinafter in Para. 3.01.F. Form ties will be permitted to fall within as-cast areas of architecturally treated wall surfaces (ACI Chapter 13); this does not apply to walls receiving textured decorative waterproof masonry coating.

9. All formed exposed to public view concrete surfaces shall have a "smooth rubbed finish". Exterior vertical surfaces shall be rubbed to one foot below grade. Interior exposed to public view vertical surfaces of liquid containers shall be rubbed to one foot below the minimum liquid level that will occur during normal operations.

B. Patching of holes due to removal of tie ends and other repairable defective areas, shall be as follows: Entire contact area of hole shall be coated with two-part moisture insensitive epoxy bonding compound as specified in Para. 2.04.B. in accordance with manufacturer's specifications, and prior to placing of freshly mixed patching mortar. Patching mortar shall be mixed and placed in general accordance with ACI Para. 9.2.2, 9.2.3, and 13.6.

C. For floors and slabs in which drains occur, special care shall be exercised to slope the floors uniformly to the drains. All floors with drains shall be sloped not less than 1/8 inch per foot unless otherwise shown. In all areas where quarry tile or other materials requiring more than 1/4 inch drop are to be overlaid, the concrete base slab shall be depressed as shown to provide a finished floor at the same elevation as surrounding areas.

D. Where not otherwise specified, finishes shall be in accordance with Paragraphs 10.4 and 11.8 of ACI 301.

3.02 TESTING

All testing shall be in accordance with provisions of ACI 301. Testing services listed in ACI Sections 16.3, 16.4 and 16.5 shall be performed by a testing agency acceptable to the Engineer. Testing services of ACI Section 16.5 shall be paid for by the Contractor at his expense. Test shall be made for each 50 cubic yards of concrete and/or each day concrete is placed.

3.03 ADDITIONAL REQUIREMENTS

A. Unless otherwise directed by the Engineer, the vertical surfaces of all footings shall be formed. Excavations and reinforcement for all footings shall have been inspected by the Engineer before any concrete is placed.

B. The installation of underground and embedded items shall be inspected before slabs are placed. Pipes and conduits shall be installed below the concrete unless otherwise indicated. Fill required to raise the subgrade shall be placed as specified in Section 02211 and 02223. Porous fill not less than 6 inches in compacted thickness shall be installed under all slabs, tank bottoms, and foundations. The fill shall be leveled and uniformly compacted to a reasonably true and even surface. The surfaces shall be clean, free from frost, ice, mud and water. Waterproof paper, polyethylene sheeting of nominal 4-mil minimum thickness, or polyethylene-coated burlap shall be laid over all surfaces receiving concrete.

C. Concrete shall be placed in layers not over 18 inches deep and each layer shall be compacted by mechanical internal-vibrating equipment supplemented by hand spading, rodding and tamping as directed. Vibrators shall not be inserted into lower courses that have begun to set.

D. Concrete mixed in stationary mixers and transported by nonagitating equipment shall be placed in the forms within 45 minutes from the time ingredients are charged into the mixing drum. Concrete that is truck mixed or transported in truck mixers or truck agitators shall be delivered to the site of the work and discharge completed in the forms within the time specified in Paragraph 10.7 of ASTM C-94, except that when the concrete temperature exceeds 85-F, the time shall be reduced to 45 minutes. Transmit-mixed concrete that is completely mixed at the site of concrete placement or batched cement and aggregates transported to mixers shall be placed in the forms within 1-1/2 hours after cement has been added. Concrete shall be placed in the forms within 15 minutes after discharge from the mixer at the job site.

E. If concrete is placed by pumping, no aluminum shall be used in any parts of the pumping system which contact or might contaminate the concrete. Aluminum chutes and conveyors shall not be used. -

F. All concrete surfaces not in contact with forms shall be moist cured by the application of absorptive mats or double thicknesses of fabric kept continuously wet. Forms shall be kept continuously wet. Use of other curing methods will not be permitted unless written authorization is received from the Engineer.

G. Formwork for beam soffits and slabs and other parts that support the weight of concrete shall remain in place until the concrete has reached its specified 28-day strength, unless otherwise specified or permitted.

H. Column base plates, bearing plates for beams and similar structural members, machinery and equipment bases shall, after being plumbed and properly positioned, be provided with full bearing with nonshrink grout. Concrete surfaces shall be rough, clean, free of oil, grease and laitance and shall be moistened thoroughly immediately before grout is placed. Metal surfaces shall be clean and free of oil, grease and rust. Mixing and placing shall be in conformance with the material manufacturer's printed instructions.

I. Concrete which, in the opinion of the Engineer, has excessive honeycomb, aggregate pockets or depressions will be rejected and the Contractor shall, at his own expense, remove the entire section containing such defects and replace it with acceptable concrete.

J. Dowels shall be installed at right angles to construction joints and expansion joints. Dowels shall be accurately aligned parallel to the finished surface, and shall be rigidly held in place and supported during placing of the concrete. One end of dowels shall be oiled or greased or dowels shall be coated with high density polyethylene with a minimum thickness of 14 mils.

- END OF SECTION -

DIVISION 4

MASONRY

SECTION 04100

MORTAR

PART 1 - GENERAL

1.01 WORK INCLUDED

Mortar and grout for unit masonry.

1.02 RELATED WORK

A. Section 01450 - Quality Control.

B. Section 04200 - Reinforced Unit Masonry System.

1.03 REFERENCES

A. ASTM C5 - Quicklime for Structural Purposes.

B. ASTM C91 - Masonry Cement.

C. ASTM C94 - Ready-Mixed Concrete.

D. ASTM C144 - Aggregate for Masonry Mortar.

E. ASTM C150 - Portland Cement.

F. ASTM C207 - Hydrated Lime for Masonry Purposes

G. ASTM C270 - Mortar for Unit Masonry.

H. ASTM C387 - Packaged, Dry, Combined Materials for Mortar and Concrete.

I. ASTM C476 - Grout for Reinforced and Non-Reinforced Masonry.

J. ASTM C780 - Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.

K. International Masonry Industry All-Weather Council (IMIAC) Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

1.04 MIX TESTS

Sampling and testing of grout and mortar shall be the responsibility of the Contractor. Mortar and grout laboratory-proportioned and tested.

1.05 SUBMITTALS

A. Submit product data under provisions of Section 01300.

B. Include design mix, environmental conditions, and admixture limitations.

C. Submit manufacturer's installation instructions under provisions of Section 01300.

1.06 ENVIRONMENTAL REQUIREMENTS

Maintain materials and surrounding air temperature to minimum 50-F prior to, during, and 48 hours after completion of masonry work.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Mortar mix can consist of any one of the following combinations:

gravel.

1. Portland Cement, lime and fine aggregate.

2. Masonry Cement and fine aggregate.

3. Portland Cement, masonry cement and fine aggregate.

4. Commercially prepared premix mortar and fine aggregate.

B. Portland Cement: ASTM C150.

C. Masonry Cement: ASTM C98.

D. Mortar Aggregate: ASTM C144.

E. Grout Course Aggregate: ASTM C404, size no. 8 or 3/811 - pea

F. Grout Fine Aggregate: ASTM C404 or C144.

G. Hydrated Lime: ASTM C207, Type S.

H. Quicklime: ASTM C5, non-hydraulic type.

I. Premix Mortar: ASTM C387, using gray cement.

J. Water: Clean and potable.

2.03 MIXES

A. Mortar for Load Bearing Walls and Partitions: ASTM C27.
Type-M.

B. Mortar for Non-Load Bearing Walls and Partitions: ASTM C270,
Type S.

C. Pointing Mortar: ASTM C270, Type N, with maximum two percent ammonium stearate or calcium stearate per cement weight.

D. Grout shall conform to ASTM C476.

2.04 MORTAR MIXING

A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270.

B. Add mortar colors and admixtures in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.

C. Do not use anti-freeze compounds to lower the freezing point of mortar or grout.

D. If water is lost by evaporation, retemper within two hours of mixing. Do not retemper mortar after two hours of mixing.

PART 3 - EXECUTION

3.01 INSTALLATION

A. After inspection of concrete grout spaces by the Engineer, plug cleanout holes with masonry units. Brace against wet grout pressure.

B. Install mortar and grout in accordance with 04300.

C. Work grout into cores and cavities to eliminate voids.

D. Do not displace reinforcing steel when placing grout.

E. Clean concrete grout spaces of excess mortar and debris.

- END OF SECTION -

SECTION 04300

UNIT MASONRY SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Each type of masonry work is indicated on the Drawings.

B. The work covered by this section consists of furnishing all labor and material required to perform each type of masonry work, to include the following types of units:

1. Split-face masonry units.

2. All trim units required to complete construction.

1.02 WORK INSTALLED BUT FURNISHED UNDER OTHER SECTIONS

A. Division 5 – Miscellaneous Metal: Fabricated steel items.

1.03 RELATED WORK

A. Section 01450 - Quality Control: Testing laboratory services.

B. Section 08100 – Standard Steel Doors and Frames

C. Section 07900 – Caulking and Sealants: Sealant at control and expansion joints.

1.04 REFERENCES

A. ASTM C129 - Non-Load Bearing Concrete Masonry Units.

B. ASTM C140-81 (1981 Rev.) - Sampling and Testing Concrete Masonry Units. Type I water absorption not to exceed 10.6 lbs./cu. ft.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Protection of Work: During erection, cover top of walls with heavy waterproof sheeting at end of each days works. Cover partially completed structures when work is not in progress.

1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.

2. Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry. Protect base of walls from rain-splashed mud and mortar splatter by means of covering spread on ground and over wall surface.

B. Cold Weather Protection:

1. Do not lay masonry units which are wet or frozen.

2. Remove any ice or snow formed on masonry bed by carefully apply heat until top surface is dry to the touch.

3. Remove all masonry determined to be damaged by freezing conditions.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Obtain units from one manufacturer, of uniform texture and color. Provide units with standards referenced and requirements indicated.

2.02 CONCRETE MASONRY UNITS

A. Size: Manufacturer's standard units with nominal face dimensions of 16" long x 8" (15-5/8" x 7-5/8" actual), unless otherwise indicated.

B. Special Shapes: Provide where required for lintels, corners, jambs, sash, controls joints, headers, bonding and other special conditions.

C. At all concrete masonry partition wall locations, where the wall construction does not extend full height to ceiling, provide solid grouted bond beams with at least one continuous #5 bar. Splices in reinforcement shall be 48 bar diameters.

D. Weight Classification: All concrete masonry shall be lightweight or normal weight concrete masonry units. Aggregate for concrete masonry units shall conform to ASTM C33-81.

E. Cure units in a moisture-controlled atmosphere or in an autoclave at normal pressure and temperature to comply with ASTM C90, Type I. Limit moisture absorption during delivery and until time of installation to the maximum percentage specified for Type I units for the average annual relative humidity as reported by the U.S. Weather Bureau Station nearest the project site shall be based upon ASTM C426 Test.

F. Cure units by atmospheric drying for not less than 30 days before installation to comply with ASTM C90, Type I.

2.03 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150, Type I, except Type III may be used for cold weather construction.

B. Aggregate for Mortar: ASTM C144, except for joints less than 1/4", use aggregate graded with 100% passing the No. 16 sieve.

C. Hydrated Lime: ASTM C207, Type S.

D. Water: Clean and potable.

E. Do not lower the freezing point of mortar by use of admixtures or anti-freeze agents. Do not use calcium chloride in mortar or grout.

F. Mortar for Unit Masonry: Comply with ASTM C270, Proportion Specification, for types of mortar required, unless otherwise indicated.

1. Use Type S mortar for exterior/interior CMU walls.

G. Grout for unit masonry shall be ASTM C-476. Grout cube testing may be required before and during construction. Only low-lift grouting (max. 4 feet) is permitted. Top of each lift is to be stopped 1-1/2" below the top of course.

H. Note: Bond beams, where applicable, are to be filled with 3500 psi concrete, not grout.

I. Grout for Unit Masonry: Comply with ASTM C476 for grout for use in construction of reinforced and on reinforced unit masonry. Use grout of consistency indicated of if not otherwise indicated, of consistency (fine or coarse) at time of placement which will completely fill all spaces intended to receive grout. Minimum 28 day compressive strength shall be 2000 psi.

2.04 MASONRY ACCESSORIES (HORIZONTAL JOINT REINFORCING)

A. Provide welded wire units prefabricated in straight lengths of not less than 10', with matching corner ("L") and intersecting ("T") units. Fabricated from cold-drawn steel wire complying with ASTM A82, with deformed continuous side rods and plain cross-rods, into units with widths of approximately 2" less than nominal width of walls and partitions as required to position side roads for full embedment in mortar coverage of not less than 5/8" of joint faces exposed to exterior and not less than 1/2" elsewhere. Provide the following type of joint reinforcing unless otherwise indicated.

1. Ladder type with perpendicular cross rods with drip section, spaced not more than 16" o.c.

2.05 ANCHOR AND TIES

Provide straps, bars, bolts and rods fabricated from not less than 16 gage sheet metal or 2-3/8" diameter rod stock, unless otherwise indicated.

2.06 MISCELLANEOUS MASONRY ACCESSORIES

A. Reinforcing Bars: Deformed steel, ASTM A615, Grade 60 for bars No. 3 to No. 18. Lap minimum 48 bar diameters.

B. Non-Metallic Expansion Joint Strips: Provide premolded, compressible, elastic fillers of foam rubber, neoprene, or extruded plastic.

C. Bond Breaker Strips: 15 lb. asphalt roofing felt complying with ASTM D226, or 15-lb, coal-tar roofing felt complying with ASTM D227.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Thickness: Build masonry construction to the full thickness shown, except build single-wythe walls (if any) to the actual thickness of the masonry units, using of nominal thickness shown or specified.

B. Build chases and recesses (if any) as shown and as required for the work of other trades. Provide not less than 8" of masonry between chase or recess and jamb of openings, and between adjacent chases and recesses.

C. Cut masonry units with motor-driven saw designed to cut masonry with clean sharp, unchipped edges. Cut units as required to provide pattern shown and to fit adjoining work neatly. Use full units without cutting wherever possible. Use dry cutting saws to cut concrete masonry units.

D. Do not wet concrete masonry units.

E. Pattern Bond: Lay concrete masonry units in the running bond pattern. Bond and interlock each course of each wythe at corners.

F. Layout walls in advance for accurate spacing of surface bond patterns, with uniform joint widths and to properly locate openings, movement-type joints, returns and offsets. Avoid the use of less-than-half size units at corners, jambs and wherever possible at other location.

G. Lay-up walls plumb and with course level, accurately spaced and coordinated with other work.

H. Built-In Work: As the work progresses, build-in items specified under this and other sections of these Specifications. Fill in solidly with masonry around build-in items.

1. Where applicable fill space between hollow metal frames and masonry solidly with mortar.

2. Where built-in items are to be embedded in cores in hollow masonry units, place a layer of metal lathe in the joint below and rod mortar or grout into core.

3. Fill CMU cores with grout 3 courses (24") under bearing plates, beams, lintels, posts and similar conditions unless otherwise indicated.

3.02 MORTAR BEDDING AND JOINTING

A. Lay masonry units, with complete filled bed, head and collar joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not flush head joints.

B. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and foundation walls and where applicable in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or to be filled with concrete or grout. For starting courses on footings where cells are not grouted, spread out full mortar bed including areas under cells.

C. Joints: Maintain joint widths shown, except for minor variations required to maintain bond alignment. If not otherwise indicated, lay walls with 3/8" joints. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials. Tool exposed joints slightly concave using a jointer larger than joint thickness. Rake out mortar in preparation for application of caulking or sealants where shown.

D. Remove masonry units disturbed after laying: clean and relay in fresh mortar. Do not pound corners at jambs to fit stretcher units which have been set in position. If adjustments are required, remove unit, clean off mortar, and reset in fresh mortar.

3.04 HORIZONTAL JOINT REINFORCING

A. Provide continuous horizontal joint reinforcing as shown and specified. Fully embed longitudinal side rods in mortar for their entire length with a minimum cover of 5/8" on exterior side of walls and 1/2" at other locations. Lap reinforcement a minimum of 6". Do not bridge control and expansion joints with reinforcing, unless otherwise indicated. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions.

B. Space continuous horizontal reinforcing as follows: space reinforcing as required by code but not less than 24" o.c. vertically.

C. Reinforce masonry openings greater than 1'-0" wide, with horizontal joint reinforcing placed in 2 horizontal joints approximately 8" apart, both immediately above lintels and below sill. Extend reinforcing a minimum of 2'-0" beyond jambs of the opening, bridging control joints where provided.

3.05 CONTROL AND EXPANSION JOINTS

A. Provide vertical expansion, control and isolation joints in masonry where shown. Build-in related masonry accessory items as the masonry work progresses.

C. Build-in joints fillers where shown, specified in a Division 7 section "Joint Sealers". Joint width for sealants: 3/8" unless otherwise indicated.

3.06 REPAIR, POINTING AND CLEANING

A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints at corners, openings, and adjacent work to provide a neat, uniform appearance, properly prepared for application of caulking or sealant compounds.

C. Clean exposed CMU masonry by dry blushing at the end of each day's work and after final pointing to remove mortar spots and droppings. Comply with recommendations in NCMA TEK Bulletin No. 28.

- END OF SECTION -

DIVISION 5

METALS

SECTION 05210

STEEL JOISTS

PART 1 - GENERAL

1.01 SCOPE OF WORK

Work included: Extent of steel joists for Storage Mezzanine is shown on drawings. Size and spacing to be determined by Metal Building Fabricator.

1.02 RELATED WORK

1. Documents affecting work of this Section include but are not necessarily limited to, General Conditions, Supplementary Conditions and Division 1 of these Specifications.
2. Section 05300 Metal Decking

1.03 QUALITY ASSURANCE

A. Provide joists fabricated in compliance with the following, and as herein specified.

1. Steel Joist Institute (SJI) "Standard Specifications for Open Web Steel Joists, K Series"
2. Steel Joist Institute (SJI) "Standard Specifications for Open Web Steel Joists, LH Series"
3. Steel Joist Institute (SJI) "Standard Specifications for Joist Girders"

B. Qualifications of Field Welding: Qualify Welding Processes and welding operators in accordance with American Welding Society "Structural Welding Code", AWS D1.1.

C. Inspection: Inspect joists in accordance with applicable SJI specifications.

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's specifications and installation instructions for each type of joist and accessories. Include manufacturer's certifications that joists comply with applicable SJI Specifications.

B. Shop Drawings: Submit detailed drawings showing layout of joist, special connections, joining and accessories. Include mark, number, type, location and spacing of joists, and bridging.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle steel joists as recommended in SJI Technical Digest No. 9 "Handling and Erection of steel joists and Joist Girders". Handle and store joists in a manner to avoid deforming members and to avoid excessive stresses.\

PART 2 - PRODUCTS

2.01 MATERIALS

A. Steel

1. Comply with applicable SJI Specifications.

2. Unfinished Treaded Fastners: ASTM A307, Grade A, regular hexagon type, low carbon steel.

3. High Strength Threaded Fasteners: ASTM A325 or A490 heavey hexagon structural bolts with nuts and hardened washers.

4. Steel Prime Paint: Comply with applicable SJI Specifications.

2.02 FABRICATION

A. General: Fabricate steel joists in accordance with applicable SJI Specifications.

B. Bridging: Provide horizontal or diagonal type bridging for joists, complying with applicable SJI Specifications.

1. Provide bridging anchors for ends of bridging lines terminating at walls or beams.

C. Shop Painting: Remove loose wscale, slag, rust, and other foreign materials from fabricated joists, joist girders, and accessories before application of shop paint.

1. Apply one shop coat of steel prime paint to joists, joist girders, and accessories by spray, dipping, or other methods to provide a continuous dry paint film thickness of not less than 0.50 mil.

PART 3 – EXECUTION

3.01 ERECTION

A. Place and secure steel joists in accordance with applicable SJI Specifications, final shop drawings, and as herein specified.

B. Bridging: Install bridging simultaneously with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom cvhords where terminating at walls or beams.

C. Fastening Joists:

1. Field weld joists and joist girders to supporting steel framework in accordance with SJI Specifications and as noted on the drawings. Coordinate welding sequence and procedure with placing of members.

2. Bolt joists to supporting steel framework in accordance with SJI Specifications. Provide high strength threaded fasteners for bolted connections of steel joists and joist girders to steel columns and at other locations where shown, installed in accordance with AISC Specifications for Structural Joints Using ASTM A325 or A490 Bolts. Bolts shall be installed with hardened washers under the element turned in tightening bolts to facilitate verification inspection.

3.02 QUALITY CONTROL

A. Contractor will engage an independent testing and inspection agency to inspect high strength bolted connections and welded connections and to perform tests and prepare test reports.

B. Testing agency will conduct and interpret tests and state in each report whether test specimens comply with requirements and specifically state any deviations therefrom..

C. Testing agency may inspect work and materials at plant before shipment; however, D/B reserves right, at any time before final acceptance, to rejuect material not complying with specified requirements.

D. Provide access for testing agency to places where work is being fabricated, produced, or erected so that required inspection and testing can be accomplished.

E. Correct deficiencies in work which in inspections and laboratory test reports have indicated to not be in compliance with requirements. Perform additional tests, at Subcontractor's expense as may be necessary to re-confirm any non-compliance or original work, and as may be necessary to show compliance of corrected work.

END OF SECTION

SECTION 05300

METAL DECKING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included: Extent of metal decking is indicated on drawings, including basic layout and type of deck units required.

B. Related Work:

1. Documents affecting work of this Section include but are not limited to, General Conditions, Supplementary Conditions and Division 1 of these specifications.

2. Section 05210 Steel Joists.

1.02 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of the following codes and standards, except as otherwise indicated or specified:

1. AISI "Specification for the Design of Cold-Formed Steel Structural Members"

2. AWS D1.3 "Structural Welding Code – Sheet Steel"

3. SDI "Design Manual for Floor Decks and Roof Decks"

B. Qualification of Field Welding: Qualify welding processes and welding operators in accordance with "Welder Qualification" procedures of AWS D1.1.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's specifications and installation instructions for each type of decking and accessories. Include manufacturer's certification as may be required to show compliance with these specifications.

B. Shop Drawings: Submit detailed drawings showing layout and types of deck panels, anchorage details, and conditions requiring supplementary framing, special jointing or other accessories.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Steel for Painted Metal Deck Units: ASTM A611, Grade C.

B. Miscellaneous Steel Shapes: ASTM A36

C. Sheet Metal Accessories: ASTM A526, commercial quality, galvanized.

D. Paint: Manufacturer's baked-on, rust inhibitive paint, for application to metal surfaces which have been chemically cleaned and phosphate chemical treated.

2.02 FABRICATION

A. General: Form deck units in length to span 3 or more supports with flush, telescoped or nested 2`` laps at ends and interlocking or nested side laps, unless otherwise indicated.

B. Open Beam Metal Floor Deck Units: Provide fluted sections of metal thickness, depth and width as shown.

PART 3 – EXECUTION

3.01 INSTALLATION

A. General: Install deck units and accessories in accordance with manufacturer's recommendations and final shop drawings, and as specified herein.

1. Place deck units on supporting steel framework and adjust to final position with ends accurately aligned and bearing on supporting members before being permanently fastened. Do not stretch or contract side lap interlocks.

2. Place deck units in straight alignment for entire length of run.

3. Place deck units flat and square, secured to adjacent framing without warp or excessive deflection.

4. Coordinate and cooperate with structural steel erector in locating decking bundles to prevent overloading of structural members.

5. Do not use floor deck units for storage or working platforms until permanently secured.

B. Fastening Deck Units:

1. Fasten floor deck units to steel supporting members by not less than 3/4" diameter fusion welds or elongated welds of equal strength spaced not more than 12" o.c. with a minimum of 2 welds per unit at each support.

2. Tack weld or use self-tapping No. 8 or larger machine screws at 4"-0" o.c. for fastening and closures.

3. Fasten roof deck units to steel supporting members by not less than 5/8" diameter fusion welds or elongated welds of equal strength, spacing where required for lateral force resistance. In addition secure deck to each supporting member in ribs where side laps occur.

4. Comply with AWS requirements and procedures for manual shielded metal arc welding appearance and quality of welds, and methods used in correcting welding work. Use welding washers where recommended by deck manufacturer.

5. Mechanically fasten side laps of adjacent deck units at supports and at midpoint between supports at intervals not exceeding 36" o.c., using self-tapping No. 12 or larger machine screws.

C. Cutting and Fitting: Cut and neatly fit deck units and accessories around other work projecting through or adjacent to the decking as shown.

D. Reinforcement at Openings: Provide additional metal reinforcement and closure pieces as required

for strength, continuity of decking and support of other work shown.

3.02 TOUCH-UP PAINTING

A. After decking installation, wire brush, clean and paint scarred areas, welds and rust spots on top and bottom surfaces of decking units and supporting steel members.

1. Touch-up painted surfaces with same type of shop paint used on adjacent surfaces.

2. In areas where shop-painted surfaces are to be exposed, apply touch up paint to blend into adjacent surfaces.

- END OF SECTION -

SECTION 05510

METAL STAIRS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included: Provide metal stairs where shown on the Drawings, as specified herein, and as needed for a complete and proper installation. Following types of stairs are included:

1. Interior concrete pan egress stairs.

B. Related work:

1. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.

1.02 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work in this Section.

B. Live and dead loads shall meet KBC requirements for all stairs and handrails.

1.03 SUBMITTALS

A. Product data: Submit:

1. Material list of items proposed to be provided under this Section;

2. Manufacturers's specifications and other data needed to prove compliance with the specified requirements;

3. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades;

4. Manufacturer's recommended installation procedures which, when approved by the Contractor, will become the basis for accepting or rejecting actual installation procedures used on the Work.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Metal pan stairs: Except as otherwise shown on the Drawings, directed by the D/B, or required by governmental agencies having jurisdiction, provide metal pan stair materials as required for the Work and complying with the following minimum standards:

1. Structural steel: ASTM A36.

2. Metal pans: Form risers and subtreads from 12 gage (or gage as required for live and dead loads) hot rolled steel complying with ASTM A526.

3. Sheet steel: Comply with following as appropriate:

   a. Galvanized: ASTM A526 and ASTM A525, coating G90;
   b. Landings: Cold rolled 12 gage steel complying with ASTM A366.

4. Steel bars and bar-size shapes:

   a. For hot-rolled carbon steel bars and bar size shapes, comply with ASTM A575 in grade as selected by the fabricator;
   b. For other steel bars and bar-size shapes, comply with ASTM A663 or ASTM A36.

5. Steel pipes:

   a. Comply with ASTM A53, type E or S, grade B; comply with ASTM 120, schedule 40;

6. Machine bolts, nuts, and washers: Comply with ASTM A307, grade A.

7. Arc-welding electrodes: Comply with AWS A5.1, using E60XX or E70XX series as required for the intended use.

8. Shop primer: Use "Tnemec Primer" or "Rustoleum Primer" – color to be grey to match unpainted structural steel.

2.02 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation as selected by the Subcontractor subject to the approval of the D/B/Contractor.

2.03 FABRICATIONS

A. Shop prefabricate in as large sections as practicable, and in strict accordance with the approved Shop Drawings and pertinent requirements of governmental agencies having jurisdiction.

B. Pipe railing and handrails: Unless otherwise indicated or approved by the D/B:

1. Fabricate from standard steel tube / pipe to shapes and dimensions indicated or thoerwise required for the use.

2. Make joints flush, with concealed and seamless fittings.

3. Accurately cut, miter, weld, and grind to achieve flush surfaces.

4. Make bends to preserve contour of the pipe.

5. Cap the ends of rails and exposed bottoms of posts and return to walls.

C. Priming:

1. Clean surfaces in accordance with Steel Structures Painting Council SP-3, "Power Tool Cleaning."

2. After surfaces are properly cleaned, apply the primer to a uniform 1.5 dry mils thickness.

PART 3 – EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Notify the Contractor of conditions which may be detrimental to timely and proper completion of the Work. Do not proceed until satisfactory conditions are corrected.

3.02 INSTALLATION

A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

B. Install the work of this Section in strict accordance with the original design, the approved Shop Drawings, pertinent requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by the D/B/Contractor, anchoring all components firmly into position for long life under hard use.

C. Pipe railing and handrails: Unless otherwise indicated or approved by the D/B:

1. At walls:

   a. Provide cast brackets having 2" clearance between railing and wall;
   b. Return handrail ends to within 1/8" of wall.
   c. Secure to wall with approved fasteners.
   d. Where on stud construction, provide backup plate within the studs and covering not less than three studs.

D. Upon complete installation, touchup field welds and abraded surfaces, use primer specified for shop use.

- END OF SECTION -

SECTION 05520

MISCELLANEOUS METAL

PART 1 - GENERAL

1.01 SCOPE OF WORK

Furnish all labor, materials, and equipment required to construct and install miscellaneous metal and metal fabrications as shown on the Drawings and specified herein. Included in this section are handrails, nuts, bolts, anchors, miscellaneous framing and supports.

1.02 RELATED WORK NOT INCLUDED

A. Concrete work is included in Division 3.

B. Painting is included in Division 9.

1.03 COORDINATION OF WORK

Coordinate with all other trades and sections of these Specifications whose work connects to, or is affected by, work under this Section. Obtain templates or drawings from suppliers of connecting items for proper size and locations of drilling, clip angles and other anchorage requirements.

1.04 QUALITY ASSURANCE

A. All fabricated materials shall be of the highest quality, free of structural, handling, and workmanship defects.

B. Pre-assemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

C. All work under this section shall be governed by:

1. Aluminum Construction Manual, Section 1, Specifications for Aluminum Structures - the Aluminum Association 1982.

2. All welding shall conform to the latest code of the American Welding Society.

D. Aluminum work shall be fabricated in a shop where the quality of work is in accordance with the highest standards for work of this type. All work shall be executed by mechanics skilled in the fabrication of aluminum, and shall be true to detail with sharp, clean profiles, fitted with proper joints and intersections and with finishes as specified.

E. Fastening shall be concealed where practicable. Thickness of metal and details of assembly and supports shall give ample strength and stiffness. Joints exposed to weather shall be formed to exclude water. Provide holes and connections for the work of other trades.

1.05 SUBMITTALS

A. Shop Drawings

1. The Contractor shall submit to the Engineer in accordance with Division 1, Section 01300 detailed shop drawings of all materials to be fabricated, and shall receive the Engineer's certification of review before fabrication. Include plans, elevations and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor bolt installation by others. Include any requirements for surface preparation, paint products, or grout.

2. Where materials or fabrications are indicated to comply with certain requirements for design loadings, include structural computations, material properties and other information needed for structural analysis. This shall not relieve the Contractor of responsibility for all errors, omissions, and deviations of his shop drawings from the Drawings and Specifications and from requirements of final results called for in the Drawings and Specifications.

3. The Contractor shall be responsible for the correctness of the details and dimensions of the finished articles. He shall verify conditions at the job before fabrication and coordinate the work with that of all other trades to prevent interference.

B. Samples: The Contractor shall submit 2 sets of representative samples of materials and finished products as may be requested by the Engineer, or as specified herein.

1.06 MEASUREMENTS AND FITTINGS

A. Obtain measurements of all work required to be accurately fitted, at the job and not from the drawings. The Contractor will be responsible for the accuracy of all such measurements and the precise fitting and assembly of the finished product. Coordinate work with that of all other trades to prevent interferences. Verify conditions at the job before fabrication.

B. Wherever possible, all parts shall be formed, cut, drilled, tapped, welded, fitted, assembled or otherwise fabricated in the shop, ready for erection.

PART 2 - PRODUCTS

2.01 ALUMINUM

A. Aluminum work shall be fabricated of plates, rolled or extruded shapes, sheets or castings conforming (unless otherwise permitted or indicated) to the following alloy and temper designations of the Aluminum Association:

1. Structural rolled or extruded shapes 6601-T6.

2. Extruded shapes 6063-T6.

3. Plates 6061-T6.

4. Castings 214.

5. Sheets 3003-F.

6. Bolts and nuts 2024-T4.

B. The Contractor shall furnish the Engineer with mill certificates and a signed statement from the fabricator that all aluminum work furnished is of the proper alloys, as specified above.

C. All structural and miscellaneous aluminum shall be Alloy 6061 (Alloy 6063 for extrusions), Temper T6, unless otherwise noted, indicated or accepted by the Engineer.

D. Aluminum fabrication shall be in accordance with ASCE the Aluminum Association "Specifications for Aluminum Structures," latest revision. Welding shall be done by the argon-shielded tungsten-arc method or the automatic or semi-automatic argon-shielded consumable-electrode method, or equal. Welding rods and electrodes shall be in strict accordance with above specifications.

E. Where anodic coating is required and type is not specified or shown on the Drawings, coating shall be Class I, A44 integral color, to be selected by Architect. Anodic coatings shall conform to the following requirements:

1. Class I Anodized Coatings:

   a. The finish shall meet quality requirements of AAMA 611-89.

   b. The coating shall be continuous, uniform in appearance and free from powdery areas.

   c. Class I coating minimum of 0.7 mil thickness.

   d. Remove any factory applied protection films immediately after installation.

   e. Provide 20-year warranty.

2. Clear Anodic Coatings: The exposed surfaces of aluminum shall be cleaned of all fabricating oils and foreign matter, given a medium caustic etch pretreatment and shall receive one of the following clear anodized finishes:

   a. No. 1 A minimum coating thickness of 0.0004 inch (0.001 mm) and a minimum coating weight of 15.5 mg per square inch (204R1).

   b. No. 2 A minimum coating thickness of 0.0008 inch (0.0018 mm) and a minimum coating weight of 27.0 mg per square inch (215R1).

2.02 NUTS AND BOLTS

A. All nuts, bolts, washers and accessories in contact with water, in any moist atmosphere or damp area such as occurs above water, or embedded in concrete exposed to the weather, shall be Type 316 stainless steel. All other nuts, bolts, washers and accessories shall be Type 304 stainless steel. Stainless steel nuts, bolts, and washers shall be used to fasten aluminum to all materials including aluminum.

B. Expansion Anchors: All expansion anchors shall be stainless steel wedge type meeting the requirements of Fed. Spec. FF-S-325, Group II, Type 4, Class 1, and shall be Phillips Red Head, Hilti, or equal. The entire anchor (bolt, expansion clip, nut and washer) shall be AISI Type 304 or 316 Series stainless steel, depending on the environment as specified above.

2.03 CONCRETE ANCHORS

A. Sizes and spacings or numbers of anchors shall be shown on the Drawings and materials shall comply with exposure requirements listed under Nuts and Bolts above. All anchors used for securing moving or vibrating equipment (pumps, motors, gears, sluice gates, conveyors, etc.), shall be of the cast-in-place type. Materials shall be Type 304 or 316 stainless steel, depending on the environment specified in 2.03 A, above.

B. The size and number of anchors shall be approved by the equipment manufacturer.

C. Unless specifically noted otherwise on the Drawings or Specifications, concrete anchors for other applications shall be chemical grout-type anchors equal to Hilti "HVA Adhesive Anchor," or Ramset "Chemset Chemical Anchors." Installation shall be in strict accordance with the manufacturer's recommendations which shall be available on the job site.

PART 3 - EXECUTION

3.01 GENERAL

A. The Contractor shall be responsible for all errors, omissions, and deviations of the shop drawings from the Drawings and Specifications. Any errors or omissions shall be brought to the attention of the ENGINEER whose interpretation and instructions shall be received before proceeding with the fabrication of that portion of the work.

B. Similarly, manufacturers' printed installation instructions shall be strictly followed and any conflicts with the shop drawings and/or Contract Drawings shall be directed to the Engineer for resolution before proceeding with installation.

C. All base plates, inserts and anchorages shown embedded in concrete shall be accurately located and secured before placing concrete as per a manufacturer supplied template. All structural members and components shall be accurately leveled, plumbed and secured at locations shown on the Drawings.

D. All members shall be assembled true and without twists or open joists. Holes that are out of match by more than 1/16-inch shall be reamed to the greatest diameter and the proper sized bolt or rivet used.

E. In case members do not properly fit during erection, any new holes which are necessary shall be drilled and material shall be cut where necessary with hack saws or other tools. No work shall be done with burners except by special permission of the Engineer.

F. Painting

1. Cleaning and painting of all fabricated materials shall be in strict accordance with Division 9, of these Specifications.

2. All ferrous metal shall be properly cleaned and given one shop coat of red lead zinc chromate, or other approved rust resisting paint. Anchors that are built into masonry or concrete shall be coated with asphalt paint unless specified to be galvanized. Where galvanized or zinc coated metal is required, it shall not be shop primed unless specifically called for.

G. Aluminum

1. The contact surfaces of aluminum with steel, dissimilar materials, concrete

and/or masonry shall be protected from corrosion by a thick coating of coal tar, Koppers Bitumastic No. 50, or equal.

3.02 FABRICATION AND INSTALLATION OF METAL WORK

A. General: All metal items shall be accurately fabricated and erected with exposed joints close fitting. All joints shall be of such character and so assembled that they will be as strong and rigid as adjoining sections. Joints shall be located where least conspicuous. Items shall have smooth finished surfaces except where otherwise shown or specified.

B. Built-In Items: Members or parts to be built in with masonry or concrete shall be in a form affording a suitable anchorage or shall be provided with approved anchors, expansion shields or other approved means of securing members.

C. Dissimilar Metals: Ferrous and non-ferrous metals shall be insulated at all contacts with felt washers, strips or sheets, bitumastic paints, or other acceptable means.

D. Connections:

1. All required anchors, couplings, bolts, and nut required to support miscellaneous metal work shall be furnished and installed as required.

2. Weights of connections and accessories shall be adequate to safely sustain and withstand stresses and strains to which they will be normally subjected.

3. Connections shall be bolted except where welding is called for in the Drawings. Bolts shall be 3/4" diameter unless noted or required otherwise.

E. Expansion Anchors:

1. Expansion anchors shall be installed in holes drilled into concrete with carbide tipped drill bits conforming to ANSI B94.12-1977, using a rotary impact hammer for ½" and larger anchors, or a hammer drill for 1/4" and 3/8" inch Hole depth shall equal or exceed the anchor manufacturer's minimum recommended embedment. Should hole depth equal anchor manufacturer's minimum recommended embedment, hole shall be cleaned out by air pressure. The minimum hole depth table following serves only as a general guide, anchor manufacturer's recommendations shall govern. Contractor shall assure hole is perpendicular and conforms in size to anchor manufacturer's recommendation.

2. Washer and nut shall be assembled on anchor so that the top of the nut is flush with the top of the anchor. Then the anchor shall be driven into the hole through the work until the washer bears against the work. The anchor shall be expanded in accordance with the manufacturer's recommendations. Edge and end distances and spacing of anchor table hereinafter, shall be complied with.

3.03 WELDING

Welding procedures, welders and welding operators, both for shop and field welding, shall be qualified and certified in accordance with the requirements of AWS D1.1 "Welding in Building Construction" of the American Welding Society. Manufacturer's and fabricator's shop drawings shall clearly show complete information and Contractor shall perform all field welding in conformance with this information regarding location, type, size and length of all welds, all in accordance with AWS A2.0 "Standard Welding Symbols" of the American Welding Society. Special conditions shall be fully explained by notes and details.

3.04 MISCELLANEOUS METAL FABRICATIONS

Rough Hardware: Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Division 6 sections.

Fabricate items to sizes, shapes and dimensions required. Furnish malleable iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

3.05 NUTS AND BOLTS

A. Bolts embedded in concrete shall be secured with templates at the time of pouring concrete. Bolts shall be suitably protected from damage throughout the construction period.

B. Damaged galvanized surfaces on nuts and bolts shall be repaired according to Article 2.04, this Section.

3.06 CONCRETE ANCHORS

A. Concrete anchors shall be installed strictly in accordance with manufacturer's printed instructions which shall be available on the job site.

B. Refer to Division 15 for supporting small pipe.

- END OF SECTION -

DIVISION 6

WOOD AND PLASTICS

SECTION 06200

FINISH CARPENTRY

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

Definition: Finish carpentry includes carpentry work which is exposed to view, is non-structural, and which is not specified as part of other sections. Types of work in this section include the installation of finish carpentry for the following, where applicable, and as detailed or indicated on the Drawings.

A. Wood window sill and trim.

B. Architectural woodwork is specified in another section of Division 6.

1.02 QUALITY ASSURANCE

Factory-mark each piece of lumber and plywood with type, grade, mill and grading agency identification, except omit marking from surfaces to receive transparent finish, and submit mill certificate that material has been inspected and graded in accordance with requirements if it cannot be marked on a concealed surface.

1.03 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Protect finish carpentry materials during transit, delivery, storage and handling to prevent damage, soiling and deteriorations.

B. Do not deliver finish carpentry materials until painting, wet work, grinding and similar operations which could damage, soil or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, finish carpentry materials must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

1.04 JOB CONDITIONS

A. Conditioning: Installer shall advise Contractor of temperature and humidity requirements for finish carpentry installation areas. Do not install finish carpentry until required temperature and relative humidity have been stabilized and will be maintained in installation areas.

B. Maintain temperature and humidity in installation area as required to maintain moisture content of installed finish carpentry within a 1.0 percent tolerance of optimum moisture content, from date of installation through remainder of construction period. The fabricator of woodwork shall determine optimum moisture content and required temperature and humidity conditions.

PART 2 - PRODUCTS

2.01 WOOD PRODUCT QUALITY STANDARDS

A. Softwood Lumber Standard: Comply with PS 20 and with applicable grading rules of the respective grading and inspection agency for the species and product indicated.

B. Woodworking Standard: Where indicated for a specific product, comply with specified provisions of the Architectural Woodwork Institute (AWI) "Quality Standards".

2.02 MATERIALS

A. Provide dressed or worked and dressed lumber, as applicable, manufactured to the actual sizes as required by PS 20 or to actual sizes and pattern as shown, unless otherwise indicated.

B. Moisture Content of Softwood Lumber: Provide seasoned lumber having a moisture content from time of manufacture until time of installation not greater than values required by the applicable grading rules of the respective grading and inspecting agency for the species and product indicated.

2.03 MISCELLANEOUS MATERIALS

Fasteners and Anchorages: Provide nails, screws and other anchoring devices of the type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible, and complying with applicable Federal Specifications. Where finish carpentry is exposed in areas of high relative humidity, provide fasteners and anchorages with a hot-dipped zinc coating (ASTM A153).

2.04 WOOD TREATMENT

A. Preservative Treatment: Following basic fabrication, provide 3-minute dip treatment of finish carpentry items indicated to receive preservative treatment in 5 percent solution of pentachlorophenol, with vehicle which will not interfere with finish application and will produce minimum effect upon appearance. Apply brush coat on surfaces cut after treatment. Provide preservative treatment on wood trim at shower enclosures and toilet rooms.

B. Kiln-dry wood after treatment to a maximum moisture content of 15% for plywood, 19% for lumber.

C. Inspect each piece of lumber and plywood or each unit of finish carpentry after drying; do not use twisted, warped, bowed or otherwise damaged or defective wood.

PART 3 - EXECUTION

3.01 PREPARATION

Condition wood materials to average prevailing humidity conditions in installation areas prior to installing.

3.02 INSTALLATION

A. Discard units of material which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements, or which are of defective manufacture with respect to surfaces, sizes or patterns.

B. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level countertops; and with 1/16" maximum offset in flush adjoining 1/8" maximum offsets in revealed adjoining surfaces.

C. Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.

D. Anchor finish carpentry work to anchorage devices or blocking built-in or directly attached to substrates. Secure to ground, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fasteners heads are required, use fine finishing nail for exposed nailings, countersunk and filled flush with finished surface, and matching final finish where transparent is indicated.

3.03 ADJUSTMENT, CLEANING, FINISHING AND PROTECTION

A. Repair damaged and defective finish carpentry work wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace woodwork. Adjust joinery for uniform appearance.

B. Clean finish carpentry work on exposed and semi-exposed surfaces.

C. Refer to Division 9 sections for final finishing of installed finish carpentry work.

D. Protection: Installer of finish carpentry work shall advise Contractor of final protection and maintained conditions necessary to ensure that work will be without damage or deterioration at time of acceptance.

- END OF SECTION -

SECTION 06400

ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to the work of this section.

1.02 DESCRIPTION OF WORK

A. Extent of each type of architectural woodwork is indicated on Drawings and in schedules.

B. Types of architectural woodwork includes architectural cabinets, as follows:

1. Oak cabinets.
2. Oak tops.
3. Architectural cabinet hardware.
4. Edge treatment shall be rounded or softened, unless otherwise indicated or detailed on the drawings

1.03 QUALITY ASSURANCE

A. AWI Quality Standard: Comply with applicable requirements of "Architectural Woodwork Quality Standards" published by the Architectural Woodwork Institute (AWI), except as otherwise indicated.

B. Coordination: Distribute copies of approved schedule for cabinet hardware specified in Division 8 section "Finish Hardware" to manufacturer of architectural woodwork; coordinate cabinet shop drawings and fabrication with hardware requirements.

C. Installer Qualifications: Arrange for installation of architectural woodwork by a firm which can demonstrate successful experience in installing architectural woodwork items similar in type and quality to those required for this project.

1.04 SUBMITTALS

A. Shop Drawings: Submit shop drawings showing location of each item, indicate room name and number, dimensioned plans and elevations, large scale details; attachment devices and other components.

B. Samples: Submit, in duplicate, for selection by the Architect, the following samples:

1. Oak, 2" x 3" for each type, color, pattern and surface finish.
2. Exposed cabinet hardware, one unit of each type and finish.

1.05 DELIVERY, STORAGE AND HANDLING

A. Protect woodwork during transit, delivery, storage and handling to prevent damage, soiling and deterioration.

B. Do not deliver woodwork, until painting, wet work, grinding and similar operations which could damage, soil or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, woodwork must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

1.06 PROJECT CONDITIONS

A. Conditioning: Woodwork manufacturer and installer shall advise Contractor of temperature and humidity requirements for woodwork installation and storage areas. Do not install woodwork until required temperature and relative humidity have been stabilized and will be maintained in installation areas.

B. Maintain temperature and humidity in installation area as required to maintain moisture content of installed woodwork within a 1.0 percent tolerance of optimum moisture content, from date of installation through remainder of construction period. Require woodwork manufacturer to establish optimum moisture content and required temperature and humidity condition.

PART 2 - PRODUCTS

2.01 FABRICATION, GENERAL

A. Wood Moisture Content: Comply with requirements of referenced quality standard for moisture content of lumber at time of fabrication and for relative humidity conditions in the installation areas.

B. Fabricate woodwork to dimensions, profiles, and details indicated with openings and mortises precut, where possible, to receive hardware and other items and work.

C. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to project site to maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

2.02 ARCHITECTURAL CABINETS, LAMINATE CLAD

A. Quality Standard: Comply with AWI Section 400 and its Division 400B.

B. Oak Cabinets: Comply with the following requirements:

1. Grade: Residential

2.03 CABINET HARDWARE AND ACCESSORY MATERIALS

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets.

2.05 FASTENERS AND HANGERS

A. Screws:

1. Select material, type, size and finish required for each use. Comply with FS FF-S-111 for applicable requirements.

2. For metal framing supports, provide screws as recommended by metal framing manufacturer.

B. Nails: Select material, type, size and finish required for each use. Comply with FA FF-N-105 for applicable requirements.

C. Anchors: Select material, type, size and finish required by each substrate for secure anchorage. Provide non-ferrous metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion-resistance. Provide toothed steel or lead expansion bolt devices for drilled-in-place anchors. Finish inserts and anchors, as required, to be set into concrete or masonry work for subsequent woodwork anchorage.

PART 3 - EXECUTION

3.01 PREPARATION

A. Condition woodwork to average prevailing humidity conditions in installation areas prior to installing.

B. Deliver concrete inserts and similar anchoring devices to be built into substrates, well in advance of time substrates are to be built.

C. Prior to installation of architectural woodwork, examine shop fabricated work for completion, and complete work as required, including back priming and removal of packing.

3.02 INSTALLATION

A. Install woodwork plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level (including tops); and with no variations in flushness of adjoining surfaces.

B. Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.

C. Anchor woodwork to anchors or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fasteners heads are required, use fine finishing nails for exposing nailing, countersunk and filled flush with woodwork, and matching final finish where transparent finish is indicated.

D. Cabinets: Install without distortion so that doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated. Maintain veneer sequence matching (if any) of cabinets with transparent finish.

E. Tops: Anchor securely to base units and other support systems as indicated.

3.03 ADJUSTMENT, CLEANING, FINISHING AND PROTECTION

A. Repair damaged and defective woodwork where possible to eliminate defects functionally and visually; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean, lubricate and adjust hardware.

C. Clean woodwork on exposed and semi-exposed surfaces. Touch-up shop-applied finishes to restore damaged or soiled areas.

D. Complete the finishing work specified as work of this section, to whatever extent not completed at shop or prior to installation of woodwork.

E. Provide final protection and maintain conditions, in a manner acceptable to fabricator and installer, which ensures architectural woodwork being without damage or deterioration at time of substantial completion.

- END OF SECTION -

DIVISION 7

ROOFING AND INSULATION

SECTION 07200

INSULATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Extent of insulation work is shown on Drawings. Required thickness shall be as indicated on the Drawings and by provisions of this section.

B. Applications of insulation specified in this section, where applicable, include the following:

1. Rigid insulation below grade and under slab.

2. Board cavity wall insulation.

3. Sound attenuation insulation.

1.03 RELATED WORK UNDER OTHER SECTIONS

A. Division 4 - Masonry.

B. Division 13 - Prefabricated Metal Building.

C. Gypsum Drywall specified in Division 9.

1.04 QUALITY ASSURANCE

A. Thermal Resistivity: Where thermal resistivity properties of insulation materials are designated by R-values they represent the rate of heat flow through a homogenous material exactly 1" thick, measured by test method included in reference material standard or for the total installation. They are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one square foot per hour at mean temperatures indicated.

B. Fire Performance Characteristics: Provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

C. Surface Burning Characteristics: ASTM E 84.

D. Fire Resistance Ratings: ASTM E 119.

E. Combustion Characteristics: ASTM E 136.

F. Maximum Allowable Asbestos Content of Inorganic Insulations: Provide insulations composed of mineral fibers or mineral ores which contain less than 0.25% by weight of asbestos of any type or mixture of types occurring naturally as impurities as determined by polarized light microscopy test per Appendix A of 40 CFR 763.

1.05 DELIVERY, STORAGE AND HANDLING

A. General Protection: Protect insulations from physical damage and from becoming wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.

B. Protection for Plastic Insulation

1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.

2. Protect against ignition at all times. Do not deliver plastic insulating materials to project ahead of installation time.

3. Complete installation and concealment of plastic materials as rapidly as possible in each area of work.

1.06 SUBMITTALS

A. Submit shop drawings in accordance with Division 1 requirements. Include manufacturer's installation data, limitations and any accessory products required for complete installation.

B. Indicate where each type of insulation is to be used and provide details for respective installations.

PART 2 - PRODUCTS

2.01 INSULATING MATERIALS

A. General: Provide insulating materials which comply with requirements indicated herein for materials, comply with referenced standards, other characteristics.

B. Preformed Units: Sizes to fit applications indicated, selected from manufacturer's standard thickness, widths and lengths.

C. Extruded Polystyrene Board Insulation: Rigid, cellular thermal insulation with closed-cells and integral high density skin, formed by the expansion of polystyrene base resin in an extrusion process to comply with ASTM C 578 for type indicated; with 5-year aged r-values of 5.4 and 5 at 40 and 75 deg. F. (4.4 and 23.9 deg.C), respectively; and as follows:

1. Type IV, 1.6 lb./cu. ft. minimum density, unless otherwise indicated.

2. Surface Burning Characteristics: Maximum flame spread and smoke developed values of 5 and 165, respectively.

D. Unfaced Sound Attenuation/Batt Insulation:

1. Fiber Type: Fibers manufactured from glass.

2. Combustion Characteristics: Passes ASTM E 119 test.

3. Surface Burning Characteristics: Maximum flame spread and smoke developed values of 25 and 50, respectively.

2.02 AUXILIARY INSULATING MATERIALS

A. Adhesive for Bonding Insulation: Type recommended by insulation manufacturer, and complying with requirements for fire performance characteristics.

B. Mechanical Anchors: Type and size indicated or, if not indicated, as recommended by insulation manufacturer for type of application and condition of substrate.

C. Mastic Sealer: Type recommended by insulation manufacturer for bonding edge joints between units and filling voids in work.

PART 3 - EXECUTION

3.01 INSPECTION AND PREPARATION

A. Require installer to examine substrates and conditions under which insulation work is to be performed. A satisfactory substrate is one that complies with requirements of the section in which substrate and related work is specified. Obtain installer's written report listing conditions detrimental to performance of work in this section. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.

B. Clean substrates of substances harmful to insulations.

3.02 INSTALLATION, GENERAL

A. Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.

B. Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.

C. Apply a single layer of insulation of required thickness, unless otherwise shown or required to make up total thickness.

3.03 INSTALLATION OF CAVITY-WALL

On units of plastic insulation, install small pads of adhesive spaced approximately 1'-0" O.C. both ways on inside face, as recommended by manufacturer. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against masonry or other construction as shown.

3.04 INSTALLATION OF GENERAL BUILDING INSULATION

A. Apply insulation units to substrate by method indicated, complying with manufacturer's recommendations. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Seal joint between closed-cell (non-breathing) insulation units by applying mastic or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with mastic or sealant.

C. Stuff loose glass fiber insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40% of normal maximum volume (to a density of approximately 2.5 lbs. per cu. ft.).

3.05 PROTECTION

General: Protect installed insulation and vapor retarders from harmful weather exposures and from possible physical abuses, where possible by nondelayed installation of concealing work or where that is not possible, by temporary covering or enclosure.

- END OF SECTION -

SECTION 07900

CAULKING AND SEALANTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work on this section.

1.02 DESCRIPTION OF WORK

A. All caulking, sealants, etc. as required by the Drawings, and specified herein or necessary to provide weathertight construction. Caulking locations include, but are not limited to, the following:

1. Perimeter of all exterior doors, louvers and window frames.

2. Expansion joints in new concrete sidewalks.

B. Extent of each form and type of joint sealer is indicated on drawings.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Refer to Division 8 sections for glazing requirements; not work of this section.

B. Refer to Division 15 and 16 sections for joint sealers in mechanical and electrical work: not work of this section.

1.04 SYSTEM PERFORMANCES

Provide joints sealers that have been produced and installed to establish and maintain watertight and airtight continuous seals.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Engage an Installer who has successfully completed within the last 3 years at least 5 joint sealer applications similar in type and size to that of this project and who will assign mechanics from these earlier applications to this project, of which one will serve as lead mechanic.

B. Single Source Responsibility for Joint Sealer Materials: Obtain joint sealer materials from a single manufacturer for each difference product required.

1.06 GUARANTEE

The Contractor shall guarantee all work under this Section against leakage for a period of three (3) years after final acceptance of work. This guarantee shall also be written against adhesive or cohesive failure, against crazing on surface greater than (3) mils, against staining of adjacent surfaces and against increase or decrease of Shore "A" Durometer hardness greater than 30% of 14-day value of sealant. Any defects occurring during the guarantee period shall be corrected at no additional cost to the Owner.

1.07 SUBMITTALS

A. Product Data: Submit manufacturer's technical data for each product required, including instructions for joint preparation and application.

B. Samples for Initial Selection Purposes: Submit manufacturer's standard bead samples consisting of strips of actual products showing full range of colors available, for each product exposed to view.

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to protect site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multi-component materials, where applicable.

B. Store and handle materials to prevent their deterioration or damage due to moisture, temperature change, contaminants, or other causes.

1.09 PROJECT CONDITIONS

A. Environmental Conditions: Do not proceed with installation of joint sealers under the following conditions:

1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealer manufacturers.

2. When ambient and substrate temperature conditions are outside the limits permitted by joint sealer manufacturer or below 40EF (4.4EC).

3. When joint substrates are wet due to rain, frost, condensation or other causes.

B. Joint Width Conditions: Do not proceed with installation of joint sealers when joint widths are less than allowed by joint sealer manufacturer for application indicated.

PART 2 - PRODUCTS

2.01 MATERIALS, GENERAL

A. Compound for caulking and sealing above grade at windows, doors, etc. shall be a one component urethane sealant suitable for use in both horizontal and vertical joints. Sealant shall be "Sonolastic NP 1" by Sonneborn, Mameco Sealant, Vulkem 116, or an approved equal, for elastomeric coating.

B. Sealant for concrete and masonry expansion units shall be a one-component, urethane, self-leveling designed for use where indicated.

C. Compatibility: Provide joint sealers, joint fillers and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by testing and field experience.

D. Colors: Provide color of exposed joint sealer as selected by Architect from manufacturer's standard colors.

E. Solvents and cleaners used in preparing surfaces for sealing shall be as recommended by the sealant manufacturer.

F. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C-920 requirements, including those for Type, Grade, Class and Uses.

2.02 JOINT SEALANT BACKING

A. General: Provide sealant backings of material and type which are non-staining; are compatible with joint substrates, sealants, primers and other joint fillers: and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Plastic Foam Join Fillers: (Where applicable) preformed, compressible, resilient, non-waxing, non-extruding strips of plastic foam of material indicated below, and of size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance. Either flexible, open cell polyurethane foam or non-gassing, closed-cell polyethylene foam, unless otherwise indicated, subject to approval of sealant manufacturer.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing bond between sealant and joint filler or other materials at back (3rd) surface of joint. Provide self-adhesive tape where applicable.

2.03 MISCELLANEOUS MATERIALS

A. Primer: Provide type recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealer-substrate and field tests.

B. Cleaners for Nonporous Surfaces: Provide non-staining, chemical cleaner of type acceptable to manufacturer of sealant and sealant backing materials which are not harmful to substrates and adjacent nonporous materials.

C. Masking Tape: Provide non-staining, non-absorbent type compatible with joint sealers and to surfaces adjacent to joint.

PART 3 - EXECUTION

3.01 INSPECTION

Require installer to inspect joints indicated to receive joint sealers for compliance with requirements for joint configurations, installation tolerances and other conditions affecting joint sealer performance. Obtain Installer's written report listing any conditions detrimental to performance of joint sealer work. Do not allow joint sealer to proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Cleaning of Joints: Clean out joint immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements:

1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealer, including dust: paints, expect for permanent, protective coatings tested and approved for sealant manufacturer; oil; grease; waterproofing; water repellents; water; surface dirt and frost.

2. Clean concrete, masonry, unglazed surfaces of quarry tile and similar porous joint substrate surfaces, by brushing grinding, blast cleaning, mechanical abrading, acid washing or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles removing from above cleaning operations by vacuuming or blowing out joints with oil free compressed air.

3. Remove laitance and form release agents from concrete.

4. Clean metal, glass, porcelain enamel, surfaces of quarry tile and other nonporous surfaces by chemical cleaners or other means which are not harmful to substrate or leave residues capable of interfacing with adhesion of joint sealers.

C. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealer manufacturer based on prior experience. Apply primer to comply with joint sealer manufacturer's recommendations. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces.

D. Masking Tape: Use masking tape where required to prevent contact to sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.03 INSTALLATION OF JOINT SEALERS

A. General: Comply with joint sealer manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:

1. Install Joint-fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint width which allow optimum sealant movement capability.

   a. Do not leave gaps between ends of joint-fillers.

   b. Do not stretch, twist, puncture or tear joint fillers.

   c. Remove absorbent joint-fillers which have become wet prior to sealant application and replace with dry material.

2. Install bond breaker tape between sealants and join-fillers, compression seals or back of joints where required to prevent thirdside adhesion of sealant to back of joint and as recommended by manufacturer.

3. Install compressible seals serving as sealant backings to comply with requirements indicated above for joint fillers.

D. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration and providing uniform, cross-sectional shapes and depths relative to joining widths which allow optimum sealant movement capability.

E. Tooling and Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer. Concave joint configuration per Figure 6A in ASTM C-962, unless otherwise indicated.

3.04 PROTECTION AND CLEANING

A. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of substantial completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce joint sealer installation with repaired areas indistinguishable form original work.

B. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers joints sealers and of products in which joints occur.

- END OF SECTION -

SECTION 08100

STANDARD STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Non-fire-rated cold-rolled steel doors and frames.

B. Cold-rolled steel interior window frames..

1.02 RELATED WORK

A. Section 08710 - Finish Hardware.

B. Section 08800 – Glass and Glazing.

C. Section 09900 – Painting.

1.03 REFERENCES

A. DHI - Door Hardware Institute: The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.

B. SDI-100 - Standard Steel Doors and Frames.

C. SDI-105 - Recommended Erection Instructions for Steel Frames.

1.04 QUALITY ASSURANCE

A. Conform to requirements of SDI-100.

1.05 SUBMITTALS

A. Submit shop drawings and product data in accordance with Division 1, Section 01300.

B. Indicate pertinent dimensioning, general construction, component connections and locations, anchorage methods and locations, hardware locations, installation details, handling and special requirements.

C. Indicate frame configuration, anchor types and spacings, location of cutouts for hardware, reinforcement, and finish.

D. Indicate door elevations, internal reinforcement, closure method, cut outs for glazing, and weatherstripping.

E. Submit manufacturer's installation instructions.

1.06 DELIVERY, STORAGE AND PROTECTION

A. Protect products per manufacturer's recommendations.

B. Protect doors and frames with resilient packaging.

C. Break seal on-site to permit ventilation.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Amweld Building Products Division.

B. Ceco Corp.

C. Curries Manufacturing, Inc.

D. Republic Builders Product Corp.

E. Steelcraft Manufacturing Company.

2.02 DOORS AND FRAMES

A. Interior Door: SDI-100 Grade II, Model 1; 18 gage.

B. Interior Frames: 16 gage thick material, core thickness to suit grade and model of door.

C. Exterior Doors: SDI-100 Grade II; Model 1; 16 gage.

D. Exterior Frame: 16 gage.

2.03 DOOR CORE

A. Interior Door Core: Impregnated cardboard honeycomb.

B. Exterior Door Core: Thermal insulation.

2.04 ACCESSORIES

A. Rubber Silencers: Resilient rubber (3 per jamb). Remove for finished painting and replace.

B. Glazing Stops: Rolled steel channel shape, mitered corners; prepared for countersink style, tamperproof screws.

2.05 FABRICATION

A. Frames shall be welded units.

B. Fabricate frames and doors with hardware reinforcement plates welded in place.

C. Prepare frame silencers. Provide three single rubber silencers for single doors and mullions of double doors on strike side, and two single silencers on frame head at double doors without mullions.

D. Close top edge of exterior door flush with inverted steel channel closure. Seal joints watertight.

E. Exterior frames to receive weatherstripping. Submit shop drawings for review by Architect.

F. At exterior locations, fabricate doors as thermal insulating door and frame assemblies and tested in accordance with ASTM C236. Maximum apparent U factor is 0.24 BTU/Hr/(sq. ft.)/degrees F.

2.06 FINISH

A. Primer: Air dried or baked on.

B. Finish: Enamel or paint suitable as base for specified finish paints. Coordinate with Division 9, Section 09900 "Painting".

C. Coat inside of frames set in masonry with bituminous coating to a thickness of 1/16 inch. Coating may be shop or field applied, specify accordingly.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install frames in accordance with SDI-105.

B. Install doors in accordance with DHI.

C. Coordinate with masonry construction for anchor placement.

3.02 TOLERANCES

A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

B. Improperly located or anchored frames will be rejected and removed and replaced at this Contractor's expense. Dented, warped, racked or otherwise defective doors or workmanship will be rejected and removed and replaced at this Contractor's expense.

3.03 ADJUSTING AND CLEANING

Adjust hardware for smooth and balanced door movement.

3.04 SCHEDULE

Refer to Drawings for door and frame schedule.

- END OF SECTION -

SECTION 08120

ALUMINUM DOORS AND FRAMES

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

A. Aluminum Association (AA)
   1. AA DAF-45 (2003) – Designation System for Aluminum Finishes

B. ASTM International (ASTM)
   1. ASTM A 36/A 36M (2004) – Standard Specification for Carbon Structural Steel
   2. ASTM B 209 (2004) – Aluminum and Aluminum-Alloy Sheet and Plate
   3. ASTM B 221 (2002) – Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
   4. ASTM E 283 (1991; R 1999) – Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
   5. ASTM E 331 (2000) – Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference

1.2 PERFORMANCE REQUIREMENTS

1.2.1 Structural

Shapes and thicknesses of framing members shall be sufficient to withstand a design wind load of not less than 30 kPa pounds per square foot of supported area with a deflection of not more than 1/175 times the length of the member and a safety factor of not less than 1.65. Provide glazing beads, moldings, and trim of not less than 0.050 inch nominal thickness.

1.2.2 Air Infiltration

When tested in accordance with ASTM E 283, air infiltration shall not exceed 0.06 cubic feet per minute per square foot of fixed area at a test pressure of 6.24 pounds per square foot (50 mile per hour wind).

1.2.3 Water Penetration

When tested in accordance with ASTM E 331, there shall be no water penetration at a pressure of 8 pounds per square foot of fixed area.

1.3 SUBMITTALS

Submit the following:

SD-02 Shop Drawings

Doors and Frames: Show elevations of each door type, size of doors and frames, metal gages, details of door and frame construction, methods of anchorage, glazing details, weatherstripping, provisions for and location of hardware, and details of installation.

SD-08 Manufacturer's Instructions: Submit detail specifications and instructions for installation, adjustments, cleaning, and maintenance.

1.3.1 DELIVERY, STORAGE, AND HANDLING

Inspect materials delivered to the site for damage. Unload and store with minimum handling. Provide storage space in dry location with adequate ventilation, free from dust or water, and easily accessible for inspection and handling. Stack materials on nonabsorptive strips or wood platforms. Do not cover doors and frames with tarps, polyethylene film, or similar coverings. Protect finished surfaces during shipping and handling using manufacturer's standard method, except that no coatings or lacquers shall be applied to surfaces to which calking and glazing compounds must adhere.

PART 2 PRODUCTS

2.1 DOORS AND FRAMES

Swing-type aluminum doors and frames of size, design, and location indicated. Provide doors complete with frames, framing members, transoms, trim, and accessories.

2.2 MATERIALS

2.2.1 Anchors: Stainless steel

2.2.2 Weatherstripping: Continuous wool pile, silicone treated, or type recommended by door manufacturer.

2.2.3 Aluminum Alloy for Doors and Frames: ASTM B 221, 6063-T6 for extrusions. ASTM B 209, alloy and temper best suited for aluminum sheets and strips.

2.2.4 Fasteners: Hard aluminum or stainless steel.

2.2.5 Structural Steel: ASTM A 36/A 36M.

2.2.6 Aluminum Paint: Aluminum door manufacturer's standard aluminum paint.

2.3 FABRICATION

2.3.1. Aluminum Frames

Extruded aluminum shapes with contours approximately as indicated. Provide removable glass stops and glazing beads for frames accommodating fixed glass. Use countersunk stainless steel Phillips screws for exposed fastenings, and space not more than 12 inches on center. Mill joints in frame members to a hairline fit, reinforce, and secure mechanically.

2.3.2 Aluminum Doors

Of type, size, and design indicated and not less than 1-3/4 inch thick. Minimum wall thickness, 0.125 inch, except beads and trim, 0.050 inch. Door sizes shown are nominal and shall include standard clearances as follows: 0.093 inch at hinge and lock stiles, 0.125 inch between meeting stiles, 0.125 inch at top rails, 0.187 inch between bottom and threshold, and 0.687 inch between bottom and floor. Double-acting doors shall have rounded edges at hinge stile, lock stile, and meeting stile edges.

2.3.2.1 Full Glazed Stile and Rail Doors: Doors shall have medium stiles and rails as indicated. Fabricate from extruded aluminum hollow seamless tubes or from a combination of open-shaped members interlocked or welded together. Fasten top and bottom rail together by means of welding or by 3/8 or 1/2 inch diameter cadmium-plated tensioned steel tie rods. Provide an adjustable mechanism of jack screws or other methods in the top rail to allow for minor clearance adjustments after installation.

2.3.3 Welding and Fastening

Where possible, locate welds on unexposed surfaces. Dress welds on exposed surfaces smoothly. Select welding rods, filler wire, and flux to produce a uniform texture and color in finished work. Remove flux and spatter from surfaces immediately after welding. Exposed screws or bolts will be permitted only in inconspicuous locations, and shall have countersunk heads. Weld concealed reinforcements for hardware in place.

2.3.4 Weatherstripping

Provide on stiles and rails of exterior doors. Fit into slots which are integral with doors or frames. Weatherstripping shall be replaceable without special tools, and adjustable at meeting rails of pairs of doors. Installation shall allow doors to swing freely and close positively. Air leakage of a single leaf

weatherstripped door shall not exceed 0.5 cubic feet per minute of air per square foot of door area when tested in accordance with ASTM E 283.

2.3.5 Anchors

On the backs of subframes, provide anchors of the sizes and shapes indicated for securing subframes to adjacent construction. Anchor transom bars at ends and mullions at head and sill.

2.3.6 Provisions for Hardware

Coordinate with existing door hardware on the facility. Deliver hardware templates and hardware (except field-applied hardware) to the door manufacturer for use in fabrication of aluminum doors and frames. Cut, reinforce, drill, and tap doors and frames at the factory to receive template hardware. Provide doors to receive surface-applied hardware, except push plates, kick plates, and mop plates, with reinforcing only; drill and tap in the field. Provide hardware reinforcements of stainless steel or steel with hot-dipped galvanized finish, and secure with stainless steel screws. Provide reinforcement in core of flush doors as required to receive locks, door closers, and other hardware.

2.3.6 Provisions for Glazing

Provide extruded aluminum snap-in glazing beads on interior side of doors. Provide extruded aluminum, theft-proof, snap-in glazing beads or fixed glazing beads on exterior or security side of doors. Glazing beads shall have vinyl insert glazing gaskets. Design glazing beads to receive glass of thickness indicated or specified.

2.3.7 Finishes

Provide exposed aluminum surfaces with factory finish of anodic coating or organic coating.

2.3.7.1 Anodic Coating: Clean exposed aluminum surfaces and provide an anodized finish conforming to AA DAF-45. Finish shall be color as selected by owner.

PART 3 EXECUTION

3.1 INSTALLATION

Plumb, square, level, and align frames and framing members. Anchor frames to adjacent construction in accordance with manufacturer's printed instructions. Anchor bottom of each frame to rough floor construction with 3/32 inch thick stainless steel angle clips secured to back of each jamb and to floor construction; use stainless steel bolts and expansion rivets for fastening clip anchors. Hang doors to produce clearances specified in paragraph entitled "Aluminum Doors," of this section. After erection and glazing, adjust doors and hardware to operate properly.

3.2 PROTECTION FROM DISSIMILAR MATERIALS

3.2.1 Dissimilar Metals

Where aluminum surfaces come in contact with metals other than stainless steel, zinc protect from direct contact to dissimilar metals.

3.2.1.1 Protection: Provide one of the following systems to protect surfaces in contact with dissimilar metals:

3.2.1.1.1 Paint the dissimilar metal with one coat of heavy-bodied bituminous paint.

3.2.1.1.2 Apply a good quality elastomeric sealant between the aluminum and the dissimilar metal.

3.2.1.1.3 Paint the dissimilar metal with one coat of primer and one coat of aluminum paint.

3.2.1.1.4 Use a nonabsorptive tape or gasket in permanently dry locations.

3.2.2 Drainage from Dissimilar Metals

In locations where drainage from dissimilar metals has direct contact with aluminum, provide protective paint to prevent aluminum discoloration.

3.2.3 Masonry and Concrete
Provide aluminum surfaces in contact with mortar, concrete, or other masonry materials with one coat of heavy-bodied bituminous paint.

3.2.4 Wood or Other Absorptive Materials
Provide aluminum surfaces in contact with absorptive materials subject to frequent moisture, and aluminum surfaces in contact with treated wood, with two coats of aluminum paint or one coat of heavy-bodied bituminous paint. In lieu of painting the aluminum, the Contractor shall have the option of painting the wood or other absorptive surface with two coats of aluminum paint and sealing the joints with elastomeric sealant.

3.3 CLEANING

Upon completion of installation, clean door and frame surfaces in accordance with door manufacturer's written recommended procedure. Do not use abrasive, caustic, or acid cleaning agents.

3.4 PROTECTION

Protect doors and frames from damage and from contamination by other materials such as cement mortar. Prior to completion and acceptance of the work, restore damaged doors and frames to original condition, or replace with new ones.

* END OF SECTION *

SECTION 08330

ELECTRICAL OVERHEAD SECTIONAL DOOR

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Extent of insulated steel overhead sectional doors is shown on the drawings.

B. Provide complete electrical operating door assemblies including door curtains, guides, counterbalance mechanism, hardware, chain hoist operator and installation accessories.

1.03 QUALITY ASSURANCE

A. Furnish each overhead electrical operated sectional door as a complete unit produced by one manufacturer, including hardware, accessories, mounting and installation components.

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's product data, roughing-in diagrams, and installation instructions for each type and size of overhead sectional door. Include operating instructions and maintenance information.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

Subject to compliance with requirements, provide products of one of the following or equal:

A. Overhead Door Corp.

B. Raynor Garage Door Corp.

C. Wayne-Dalton

2.02 PERFORMANCE REQUIREMENTS

A. Wind Load: 20 lbf/sq.ft.

B. Operation Cycles: 10,000

2.03 COMPONENTS

A. Steel Door Sections: Insulated panels.
   1. Finish: Primer and white finish coats.

B. Galvanized steel track system.

C. Weatherseals.

D. Manual Door Operation: Push up.

E. Electric Door Operation: Trolley or drawbar type, with three button control station.
1. Obstruction Detection Device: Pressure-sensor edge.

PART 3 - EXECUTION

3.01 GENERAL

A. Install door and operating equipment complete with necessary hardware, jamb and head mold strips, anchors, inserts, hangers, and equipment support in accordance with final shop drawings, manufacturer's instructions, and as specified herein.

B. Upon completion of installation including work by other trades, lubricate, test and adjust doors to operate easily, free from warp, twist or distortion and fitting weathertight for entire perimeter.

- END OF SECTION -

SECTION 08520

ALUMINUM WINDOWS

PART 1 - GENERAL

1.01 WORK INCLUDED

Furnish all necessary materials, labor and equipment for the complete installation of aluminum framing as shown on the Drawings and specified herein including all venting hoppers shown on the elevations.

1.02 SUBMITTALS

A. Submit shop drawings and product data in accordance with Division 1, Section 01300.

B. Indicate pertinent dimensioning, general construction, component connections and locations, anchorages methods and locations, hardware locations, installation details, and special requirements.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Test Units

1. Air, water and structural test units sizes and configuration shall conform to requirements set forth in AAMA 101-97.

B. Test Procedures and Performance Standards:

1. Windows shall conform to all ANSI/AAMA 101-97, AW-80 requirements.
2. Air Infiltration Test
   a. Test unit in accordance with ASTM E283. Air infiltration shall not exceed .01 cfm per foot of perimeter crack length.
3. Water Resistance Test
   a. Test unit in accordance with ASTM E331 at static pressure difference of 12.00 psf. There shall be no uncontrolled water leakage.
4. Uniform Load Deflection Test
   a. Test unit in accordance with ASTM E330. No member shall deflect more than 1/175 of its span.
5. Life Cycle Test
   a. Tested in accordance with AAMA 910, there shall be no damage to fasteners, parts, support arms, activating mechanisms, or any other damage which would make the window inoperable.

2.02 QUALITY ASSURANCE

A. Provide test reports from AAMA accredited laboratories certifying the performance was specified in Section 1.1.

B. Test reports shall be accompanied by the window manufacturer's letter of certification stating that the tested window meets or exceeds the referenced criteria for the appropriate ANSI/AAMA 101-97 window types.

2.03 WARRANTY

A. Windows: One year.

2.04 WINDOWS

A. Type: projected awning, as indicated on Drawings.
B. Manufacturers:
   1. Operable windows are to be Series 8250 as manufactured by Custom Window Company, Englewood, Colorado, or approved equal.
C. Hardware:
   1. Projected ventilators: standard concealed 4-bar zinc plated or stainless steel balanced arms and cam locking handles.
D. Insect Screens (for operable windows only):
   1. Aluminum Frame: screen frames shall be extruded or roll formed aluminum.
   2. Screen: screen mesh shall be aluminum or fiberglass.
E. Finishes: AA-M12C22A31-Class II, clea or AA-M12CC22A44-Class I, color anodic.

PART 3 - EXECUTION

3.01 INSTALLATION

All glass framing shall be set in correct locations as shown in the details and shall be level, square, plumb and in alignment with other work in accordance with the manufacturer's installation instructions and approved shop drawings. All joints between framing and the building structure shall be sealed in order to secure a watertight installation.

- END OF SECTION -

SECTION 08620

PLASTIC UNIT SKYLIGHTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

All of the Contract Documents, including General Conditions, and Division 1 General Requirements, apply to the work of this Section.

1.02 SUMMARY OF WORK

A. The work of this Section includes plastic unit skylights of the following types:

Domed curb mounted skylights.

1.03 REFERENCES

A. Voluntary Standard Uniform Load Test Procedure for Plastic Glazed Skylights by Uniform Static Air Pressure Difference.

E. American Society for Testing and Materials

a. ASTM D4802 Specification for Poly (Methyl Methacrylate) Acrylic Plastic Sheet

b. ASTM E331 Test Method for Water Penetration of Exterior Windows, Curtains Walls and Doors by Uniform Static Air Pressure Difference.

F. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.

1.04 PERFORMANCE REQUIREMENTS

A. Design framing and dome infill to support the following load requirements:

1. 40 PSF snow load plus dead load.

2. 25 PSF negative wind or uplift load plus dead load.

B. Plastic unit skylights shall conform to recommendations of the AA Specifications for Aluminum Structures and AAMA Publications as applicable to products specified:
AAMA 603.8, 605.2, 606.1, 607.1 and 1605.1.

C. Fabrication and installation of plastic unit skylights shall comply with NRCA recommendation that the top of curb to finish roofing dimension be a minimum of 8 inches.

1.05 SUBMITTALS

A. Product Data: Submit manufacturer's product data, use limitations and recommendations for the entire system, including both published data and any specific data prepared for this project.

B. Shop Drawings: Submit shop drawings for approval prior to fabrication. Include detailed plans, elevations and details of framing members, glazing materials, sealants, fasteners, anchors, thickness and types of formed flashing and closures. Indicate relationship of adjacent materials.

C. Samples: Submit a verification sample of plastic glazing material in specified color. For aluminum, if other than mill finish required, submit a verification sample of finish and color specified.

1.06 QUALITY ASSURANCE

A. Manufacturer: Plastic unit skylights shall be manufactured by a firm with a minimum of 10 years of experience in the fabrication and installation of plastic unit skylights. Manufacturers proposed for use, which are not named in this Section shall submit evidence of ability to meet performance and fabrication requirements specified and shall include al list of projects of similar design and complexity completed within the past five years.

B. Installer: Plastic unit skylights shall be installed by workmen with a minimum of 2 years experience in installation of similar units.

C. Materials: For each type of material required for the work of this Section, provide primary materials which are the products of one manufacturer. Provide secondary materials which are acceptable to the manufacturers of the primary materials.

1.07 DELIEVERY, STORAGE, AND HANDLING

A. Deliver materials and products in labeled packages. Store and handle in strict compliance with manufacturer's instructions and recommendations. Protect from damage from sunlight, weather, excessive temperatures and construction operations.

B. Sequence deliveries to avoid delays, but minimize on-site storage.

1.08 PROJECT CONDITIONS

Field Measurements: Take accurate field measurements before fabrication.

1.09 WARRANTY

A. Skylight Warranty: Provide written warranty signed by the manufacturer, agreeing to repair or replace work which exhibits defects in materials or workmanship and guaranteeing weather tight and leak free performance. "Defects" is defined as uncontrolled leakage of water and abnormal aging or deterioration.

Warranty Period: Five (5) years from date of skylight completion.

B. Finish Warranty: Provide written warranty signed by the manufacturer and finisher, agreeing to repair or replace work which exhibits defects in finish. "Defects" is defined as peeling, chipping, chalking, fading, abnormal aging or deterioration, and failure to perform as required.

Warranty Period for Anodized Finish: One year from date of application for film integrity.

PART 2 -- PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

E. Provide plastic unit skylights by:

1. Naturalite Skylight Systems, Terrell, TX, 1-800-527-4018

2. Fiore Skylights, Inc., Somerdale, N.J., 1-800-346-7310

3. Wasco Products, Inc., Sanfora, Maine, 1-800-388-0293

2.02 MATERIALS AND FABRICATION

Domed Skylights: Curb-mounted units consisting of extruded aluminum framing. Sill members shall collect and weep water infiltration and condensation to the exterior. Factory slot sill members at anchor locations for thermal movement. All continuous gaskets above and below plastic glazing material shall be black EPDM. Factory assemble units. Submit test report for double glazed model showing 6.24 PSF static water resistance when tested per ASTM E331.

A. Glazing: Polycarbonate plastic glazing

B. Outer dome color: colorless

C. Inner dome color: white

D. Frame finish: Manufacturer's A31 clear anodized finish

E. Size: 4'-0" wide by 6'-0" long each skylight.

PART 3 – EXECUTION

3.01 EXAMINATION

Take field dimensions and examine conditions of substrates, supports, and other conditions under which this work is to be performed and notify the Contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Strictly comply with manufacturer's instructions and recommendations. Match profiles, sizes and spacing indicated on approved shop drawings.

B. Coordinate installation with adjacent work such as roofing, sheet metal and other work to ensure creation of a complete weatherproof assembly. Anchor work securely to supporting structure, but allow for differential and thermal movement.

C. Isolate between aluminum and dissimilar metals with a protective coating or plastic strip to prevent electrolytic corrosion.

3.03 ADJUSTING, CLEANING AND PROTECTION

A. After installation, remove shipping labels and part number markings from components. Do not remove "risk of fall" label from units.

B. Touch-up and repair minor damage to eliminate all evidence of repair. Remove and replace work which cannot be satisfactorily repaired.

C. Clean all exposed surfaces including metal and glazing using non-abrasive materials and methods recommended by manufacturer of material or product being cleaned. Remove and replace work that cannot be successfully cleaned.

D. Re-clean as necessary to prevent damage. Protect completed work from damage and deterioration and inspect immediately before final acceptance of project.

- END OF SECTION -

SECTION 08710

FINISH HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work of this section.

1.02 SUMMARY

A. Work under this heading includes furnishing all hardware to the respective trades. The hardware supplier shall promptly furnish templates to all other manufacturers furnishing materials necessary for completion of this part.

B. Extent of finish hardware required is indicated on Drawings and in schedules.

C. The following specifications are a guide and a description of the quality materials required. No material of quality or weight less than that outlined in this specification will be accepted. The Contractor will be responsible for supplying the correct quantity of all materials, whether or not specifically mentioned in this specification. Any additional items that may be required shall be furnished and be of type, quality and utility consistent with other hardware specified.

1.03 SUBMITTALS

A. Architect's Hardware Schedule

1. Architect's hardware schedule is by hardware set number. Refer to Drawings for designation of hardware set number applicable to each opening.

2. Certain additional items of hardware and/or hardware accessories specified herein shall be furnished and installed, although not appearing in Architect's hardware schedule.

B. Supplier's Hardware Submittals

1. Complete hardware schedule, indicating type, number, location and finish shall be submitted to Architect for approval. Opening numbers shall be same as used in contract documents. Schedule shall be prepared according to A.S.A.H.C. recommendations (schedule and sequence format) and shall include degree of door closer installation.

2. Supplier's hardware schedule will be reviewed by Architect for type, quality and finish, and for function (other than hand). Contractor shall be responsible for checking schedule for correct hand of locksets and for supplying quantity of items required by contract documents.

3. Provide supplementary or revised hardware schedules if deemed necessary by Architect.

4. Do not ship or deliver hardware to job prior to review of hardware schedules by Architect.

5. Hardware schedule shall be submitted in the following format. Hardware schedules submitted to Architect for review not in this format will be rejected:

Hardware Set 1 Job No. _____
1 sgle 90 deg. DR #001 exterior from Corridor RHRB
Key Group _____ 3'8" x 7'0" x 1-3/4" HMD x HMF Narrow Lite

Item No.	Quantity Product Type	Manufacturer's Number, Size, Finish & Product Information
1	3 EA Hinges	FBB199 NRP 4 1/2 X 4 1/2 X TMS X US26D
2	1 EA Cylinder	1109 US26D X GGMK
3	1 EA Exit Device	99NL US28 X 3'8" x 7'0" HMD X HMF X Narrow Lite X RHRB
4	Etc.	

1.04 QUALITY ASSURANCE

A. Hardware Consultant: As a mandatory requirement, all hardware shall be furnished by an established builders' firm who maintains and operates an office, display and stock in this area, and who is a regular authorized distributor of the lock he proposes to furnish. All hardware for the project shall be scheduled and furnished by or under the direct supervision of a regular member in good standing, of the American Society of Architectural Hardware Consultants, who is also a full-time employee of the supplier. All schedules submitted to the Architect for approval and job use shall carry the signature of this consultant.

B. No consideration will be granted for any alleged misunderstanding of the material to be furnished or work to be done, it being fully understood that the tender of a proposal carries with it the agreement to all items and conditions referred to herein or indicated on plans, whether specifically mentioned herein or not.

C. It shall be the responsibility of the hardware supplier to provide the proper hardware for door function and to meet the proper codes. All discrepancies shall be brought to the attention of the Architect a minimum of ten (10) days prior to bid date so an addendum may be issued. No additional compensation will be allowed after bidding for hardware changes required to meet the proper door function or to meet the proper codes.

D. Hardware changes required to meet the proper door function or to meet the proper codes.

E. Applicator: Finish hardware shall be installed by the carpentry contractor using mechanics skilled in this type of work. Installation shall be in a neat workmanlike manner in accordance with the approved hardware schedule. All items of hardware shall be secure and free working in the manner intended. Hardware shall be accurately mortised and fitted before painting. Hardware shall not be applied until the painting is finished. After hardware is installed, the General Contractor shall cover all exposed surfaces of kick plates, push plates, pulls, locksets, exit devices, holders, etc., with a suitable covering, such as masking tape and polyethylene film to protect the hardware from scratches, abrasion and tarnishing. This is to be left on until the building is completed and ready for final inspection. Upon completion of application, the Contractor shall deliver to the Architect, for the Owner's maintenance personnel, two copies of all installation instruction, templates, wrenches, installation tools, etc., supplied by the various manufacturers packed with the hardware necessary for installation and maintenance.

1.05 PROJECT CONDITIONS

A. Delivery Storage and Handling: Hardware supplier shall receive and check all hardware at his warehouse. All hardware shall be delivered to the job site by the hardware supplier in one shipment. Drop shipments to the job site from the various manufacturers will positively not be permitted. All hardware shall be properly wrapped in separate packages complete with trimmings, screws, etc., each plainly labeled and numbered to agree with the door numbers and Contractor's typewritten schedule. The Contractor shall submit his schedules for corrections and approval to the Architect before proceeding with any work. The hardware supplier shall repack all separate boxes and packages of hardware, in cartons or cases, and attach to the outside of each case or carton, a label indicating the manufacturer of the material, contents, quantity, item number on hardware schedule and door number, before delivery to the job site. Hardware, when required, shall be delivered to the shops of the various door manufacturers properly marked and labeled following the same procedure outlined above for job site shipment.

B. The General Contractor shall provide storage facilities for the finish hardware after delivery to the job site. A separate room, under lock and key, with shelves and bins as necessary to provide dry storage for all hardware items will be required.

1.06 ITEMS NOT INCLUDED

Hardware for metal windows, cabinets, access panels, etc., is not included in this specification. See other sections of the specifications for hardware to be furnished by others under such sections.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. The following manufacturers are acceptable:

PRODUCTS	ACCEPTABLE
Hinges	McKinney, Stanley, Hager
Pivots	Hager, Rixon
Locks	Sargent, Yale, Trimco
Mortise Bolts	Baldwin, Cipco
Closers	LCN, Yale
Exit Devices	Yale, Sargent; Von Duprin
Kickplates	Baldwin, Cipco, Trimco
Thresholds	Reese, Von Duprin; Zero, Nat'l Guard
Weatherstrip	Pemko, Zero, Nat'l Guard
Door Stops	Cipco, Glynn Johnson, Greenleaf, Sargent. Trim
Cylinders	Best

B. Refer to Part 3 - Execution, for Finish Hardware Schedule.

2.02 MATERIALS

General: Materials and products specified herein are deemed equally acceptable. To simplify hardware schedule, however, only one manufacturer's product is listed in hardware sets. In each case, product of manufacturer first named in specification is used in schedule. Where specific products of each manufacturer are not identified by series or catalog number, most comparable items of each manufacturer named to item specifically identified shall be considered equal of product identified. Where only a series of a manufacturer is named, other characteristics such as function shall be the same as for product specifically identified.

2.03 HARDWARE FINISHES

Hardware finishes shall be as follows unless specified in hardware sets:

US26D - Hinges, locks, stops, bolts, overhead holders
US32D - Push plates, pull plates
Sprayed aluminum enamel - door closers
Aluminum - Thresholds and weatherstrips
US26D - Exit devices
US32D - Protective plates

2.04 HINGES

Hinges shall be five-knuckle construction. Hinges for exterior doors shall be solid bronze with non-removable pins, in the finish specified. Hinges for interior doors shall be steel, plated in the finish specified. Oil impregnated bearings are not an acceptable substitute for ball bearings. All hinges shall be 4 1/2" x 4 1/2" x .134" unless otherwise specified.

2.05 PIVOTS

Pivots for non-label openings shall be finished bronze with plated finish as indicated. Pivots shall have ball and needle bearings with 3/4" offset. Pivots shall support a door weight of 400 pounds per set. Pivots for label openings shall be malleable iron and shall support a door weight of 350 pounds per set.

2.06 LOCKSET

All knob locks shall be mortise or cylindrical type as indicated. Lock bodies and lock trim shall be by same manufacturer. Backset on all knob locks and dead locks shall be 2 3/4". All dead locks shall have 1" throw bolts and be equipped with armor fronts. Trim for locksets shall be as indicated in hardware sets.

2.07 EXIT DEVICES

Exit devices shall be rim type. Exit devices shall be operated by horizontal touch. Touch bar assembly shall have key dogging feature. All units shall have DL feature. Finish for exit device shall be US26D. Exit device for UL doors shall be rim type or concealed vertical rod type. Trim shall be of material, design, and dimensions as specified. Devices for label doors shall be listed with Underwriters Laboratories as fire exit hardware and shall have their label attached to the device.

2.08 CLOSERS

Door closers shall be full rack and pinion type. Closers shall be surface mounted and shall project less than three (3) inches from surface of door or frame. Equip closers with two (2) key-operated

regulating valves for individual control of both closing and latching speeds. Regulating valves shall be accessible from top of closer only and shall be completely unobtrusive. Closer shall have minimum of 15% door closing power adjustment and adjustable back check. Enclose closers in a cover of molded plastic. Mount closers without use of brackets or other obstructions in door opening. Closers on all exterior out-swinging doors and others as scheduled shall be parallel arm installation. Closer bodies and/or closer feet to be mounted on surface of doors shall be supplied with sex bolts.

2.09 AUTOMATIC DOOR OPERATORS AND ELECTRIC LOCKING CONTROLS

A. Construction: All swing door operators shall be transom-mounted, self-contained units such as Keane-Monroe 2000, Besam 455 or Dor-o-Matic. All components (operators, motors, controls, power supplies, etc.) of the door operating system shall be contained in the operator cover. Operators shall function like a manual door closer when the door is used manually. Force to push the door open manually shall not exceed 15 lbs. at the lock edge. Provide individual controls for opening speed, and force, backcheck force and position, closing speed, latch speed and hold-open time. Press plate shall be 4 1/2" square and project no more than 1/2" from the wall surface. Press plate shall be engraved with the handicap logo and the legend "Press to Operate".

B. Operation: The opening cycle of swing doors shall be initiated by wall-mounted press plates. Doors shall hold-open in their full open position, without the motor running, for the selected time delay period. All door operators shall be installed and adjusted to comply with ANSI A156.19-1984 including signage.

C. Finishes: Operator finish shall be as indicated in hardware sets.

D. Warranty: The door automation subcontractor shall warranty the materials and installation for a period of one year from the date of final acceptance. The subcontractor shall have available, locally, personnel fully trained and equipped to service the products and systems included in this project.

E. Installation: Set units plumb, level and true to line, without warp or rack of frames or doors. Anchor securely in place (number, size and placement of anchors as detailed in approved shop drawings).

F. Testing: Prior to final acceptance, subcontractor shall cycle test each door (100 cycles in two hours) and then readjust and relubricate door operators and confirm proper operation. Subcontractor shall provide for each door a written confirmation, witnessed by the General Contractor's Superintendent, that the cycle test was completed, as specified.

G. Cleaning: After installation, clean all surfaces, removing marks, packaging residue, pencil marks, mastic, etc.

2.09 PROTECTIVE PLATES

Kick, armor and mop plates shall be height listed in schedule and width of 2" less than single door width or 1" less than width of each leaf on pairs of doors. Plates shall be 16-gauge stainless steel, beveled three sides.

2.10 THRESHOLDS

Provide (aluminum) thresholds where scheduled, with machine screws, lead expansion shields and R.C.E. feature.

2.11 DOOR STOPS

Provide door stops where necessary to prevent door or hardware from striking an adjacent partition or obstruction. Provide wall type whenever possible. All door stops and holders mounted on concrete floor or masonry walls shall have machine screws and lead expansion shields. Provide stops at carpeted areas with 1/2" spacers.

2.12 KEYING

All Best cylinders shall be keyed to match existing lock sets and master keyed to the new building master key system. Provide two (2) keys per lock and six (6) master keys. Cylinders shall be shipped to job with construction cores. Permanent cores and all permanent keys shall be shipped direct to the Owner for installation by the Owner after completion of the project. Construction cores and construction keys will be returned to the manufacturer by the Owner.

PART 3 - EXECUTION

3.01 APPLICATION

A. Installation: Work shall be done by a craftsman skilled and experienced in installation of finish hardware. Mortised items shall be neatly set in and made flush with door or frame surface. Manufacturers' instructions and recommendations shall be strictly followed.

B. Locations: Mortised items shall be installed at frame manufacturer's standard locations. Surface-mounted items shall be installed at heights recommended by the Door and Hardware Institute, Arlington, Virginia.

C. Fasteners: Hinges, pivots, locks and exit devices shall be installed with proper wood or machine screws supplied by the manufacturer. Surface closers shall be mounted to door with sex bolts. Door pulls shall be fastened with 1/4 20 machine screws and expansion anchors.

HARDWARE SCHEDULE

Hardware Set 01

1 ½ Pair	Hinges
1 Each	Exit Device
1 Each	Closer
1 Set	Weatherstrip
1 Each	Door Sweep
1 Each	Threshold

Hardware Set 02

1 ½ Pair	Hinges
1 Each	Lockset
1 Each	Closer
1 Each	Kickplate

Hardware Set 03

3 Each	Hinges
1 Each	Exit Device
1 Each	Closer
1 Set	Weatherstrip

1 Each	Sweep
1 Each	Threshold

Hardware Set 04

3 Each	Hinges
1 Each	Lockset
1 Each	Wall Stop
1 Each	Floor Stop

Hardware Set 05

1 ½ Pair	Hinges
1 Each	Exit Device
1 Each	Lockset
1 Each	Closer
1 Each	Wall Stop
1 Each	Kickplate

Hardware Set 06

1 ½ Pair	Hinges
1 Each	Lockset
1 Each	Kickplate
1 Each	Wall Stop

Hardware Set 07

1 ½ Pair	Hinges
1 Each	Privacy lock
1 Each	Kickplate
1 Each	Wall Stop

- END OF SECTION -

SECTION 08800

GLASS AND GLAZING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Extent of glazing work is indicated on Drawings and schedules.

B. All exterior window glass.

C. All interior doors with vision light.

D. All interior windows.

E. See Drawings for type of glass.

1.02 RELATED WORK

A. Section 08100 - Steel doors and Frames.

B. Section 08520 – Aluminum Windows.

1.03 REFERENCES

A. ANSI Z97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Material Used in Buildings.

B. FS DD-G-451 - Glass, Float or Plate, Sheet, Figure (Flat, for Glazing, Mirrors and Other Uses).

C. FS DD-G-1403 - Glass, Plate (Float), Sheet, Figured, and Spandrel (Heat Strengthened and Fully Tempered).

D. FGMA - Glazing Manual. Glazing Sealing Systems Manual.

1.04 QUALITY ASSURANCE

A. Conform to Flat Glass Marketing Association (FGMA) Glazing Manual. Glazing Sealing Systems Manual for glazing installation methods.

B. Prime Glass Standard: FS DD-8-451.

C. Heat Treat Glass Standard: FS DD-G-1403.

1.05 SUBMITTALS

A. Submit product data under provisions of Division 1.

1.06 DELIVERY, STORAGE, AND PROTECTION

A. Deliver products to site under provisions of Division 1.

B. Store and protect products under provisions of Division 1.

1.07 WARRANTY

A. Provide ten year manufacturer's warranty under provisions of Section 01740.

B. Warranty: Include coverage (written warranty) of sealed glass units from seal failure, interpane dusting or misting, and replacement of same for a period of 10 years after seal date permanently imprinted on unit.

PART 2 - PRODUCTS

2.01 ACCEPTABLE GLASS MANUFACTURERS

A. PPG Industries.

B. Libby-Owens Ford Co.

C. Ford Glass Co.

D. C-E Glass Division.

E. ASG Industries, Inc.

F. Or equal.

2.02 GLASS MATERIALS (Where Applicable)

A. Type I - Tempered Glass: Provide prime glass, clear, 1/4" thick, quality q3, which has been heat treated to strengthen glass in bending to not less than 4.5 times annealed strength for doors.

B. Type II - Insulating Glass: Provide 2 sheets of glass as follows, and 1/2" dry air space or gas filled with -20 degrees F. dew point with Class A sealant-type edge construction to maintain hermetic seal.

1. Exterior Glass: Heat strengthened, manufacturer's standard float glass, quality q3, 1/4 inch thick tinted glass, manufacturer's full line of available tints.

2. Interior Glass: Clear float, quality q3, 1/4" thick, tempered where required.

3. Edge Construction: Twin primary seals of polyisobutylene; tubular aluminum or galvanized spacer-bar flame with welder or solder sealed corners and filled with desiccant; and secondary seal outside of bar, bonded to both sheets of glass and bar, of polysulfide silicone; or hot-melt butyl clastomeric sealant.

2.03 GLAZING SEALANTS AND COMPONENTS

A. General: Provide color of exposed sealant/compound indicated or if not otherwise indicated, as selected by Architect from manufacturer's standard colors, or black if no color is so selected. Comply with manufacturer's recommendations for selection of hardness, depending upon the location of each application, conditions at time of installation, and performance requirements as indicated. Select materials, and variations of modifications, carefully for compatibility with surfaces contacted in the installation.

B. 2-Part Polysulfide Glazing Sealant: Elastomeric polysulfide sealant complying with FS TT-S-227, Class A, Type 2; specially compounded and tested to show a minimum of 20 years resistance to deterioration in normal glazing applications.

2.04 GLAZING GASKETS

A. Molded Neoprene Glazing Gaskets: Molded or extruded neoprene gaskets of the profile and hardness required for water-tight construction; comply with ASTM D 2000 designation 2BC 415 to 3BC 620, black.

B. Vinyl Foam Glazing Tape: Closed cell, flexible, self-adhesive, non-extruding, polyvinyl chloride foam tape; recommended by manufacturer for exterior, watertight installation of glass, with only nominal pressure in the glazing channel; comply with ASTM D 1667.

2.05 MISCELLANEOUS GLAZING MATERIALS

A. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

B. Setting Blocks: Neoprene or EPDA, 70-90 durometer hardness, with proven compatibility with sealants used.

C. Spacers: Neoprene or EPDM, 40-50 durometer hardness with proven compatibility with sealants used.

D. Compressible Filler (Rod): Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, proven to be compatible with sealants used, flexible and resilient, with 5-10 psi compression strength for 25% deflection.

PART 3 - EXECUTION

3.01 STANDARDS AND PERFORMANCE

A. Watertight and airtight installation of each glass product and insulated panel is required, except as otherwise shown. Each installation must withstand normal temperature changes, wind loading, impact loading (for operating sash and doors), without failure including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the work.

B. Protect glass and panels from edge damage during handling and installation, and subsequent operation of glazed components of the work. During installation, discard units with significant edge damage or other imperfections.

C. Glazing channel dimensions as shown are intended to provide for necessary bite on glass, minimum edge clearance, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by job conditions at time of installation.

D. Comply with combined recommendations and technical reports by manufacturers of glass and glazing products as used in each glazing channel, and with recommendations of Flat Glass Marketing Association "Glazing Manual", except where more stringent requirements are indicated.

E. Install insulating glass units to comply with recommendations by Sealed Insulating Glass Manufacturers Association, except as otherwise specifically indicated or recommended by glass and sealant manufacturers.

3.02 PREPARATION FOR GLAZING

A. Clean glazing channel and other framing members to receive glass and panels immediately before glazing. Remove coating which are not firmly bonded to substrate. Remove lacquer from metal surfaces where elastomeric sealants are used.

B. Apply primer or sealant to joint surfaces where recommended by sealant manufacturer.

3.03 GLAZING

A. Install setting blocks of proper size in sill rabbet, located 1/4th of glass width from each corner. Set blocks in thin course of heel-bead compound, if any.

B. Provide spacers inside and out, of proper size and spacing, for glass sizes larger than 50 united inches, except where gaskets or preshimmed tapes are used for glazing. Provide 1/8" minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.

C. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.

D. Voids and Filler Rods: Prevent exudation of sealant or compound by forming voids or installing filler rods in channel at heel of jambs and head (do not leave voids in sill channels), except as otherwise indicated and depending on light size, thickness and type of glass, and complying with manufacturer's recommendations.

E. Force sealants into channel to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.

F. Tool exposed surfaces of glazing liquids and compounds to provide a substantial "wash" away from glass. Install pressurized tapes and gaskets to protrude slightly out of channel, so as to eliminate dirt and moisture pockets.

G. Clean and trim excess glazing materials from glass and stops or frames promptly after installation, and eliminate stains and discolorations.

H. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when installation is subject to movement. Anchor gasket to stop with matching ribs, or by proven adhesives, including embedment of gasket tail in cured heel bead.

I. Gasket Glazing: Miter cut and bond ends together at corners where gaskets are used for channel glazing, so that gaskets will not pull away from corners and result in voids or leaks in glazing system.

3.04 CURE, PROTECTION AND CLEANING

A. Protect exterior glass and panels from breakage immediately upon installation, by use of crossed streamers attached to framing and held away from glass. Do not apply markers to surfaces of glass. Remove nonpermanent labels and clean surfaces of glass. Remove nonpermanent labels and clean surfaces. Cure sealants for high early strength and durability.

B. Remove and replace glass or panels which are broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.

C. Wash and polish glass on both faces not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion in each area of project. Comply with glass product manufacturer's recommendations for final cleaning.

- END OF SECTION -

DIVISION 9

FINISHES

SECTION 09250

GYPSUM DRYWALL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Furnish all labor, materials and equipment required to construct and install gypsum drywall systems as indicated on the drawings and schedules and specified herein.

B. Types of Work Included:

1. Gypsum drywall wall construction including screw-type metal support system for single and double layer application, (where applicable).

2. Interior Gypsum Drywall Ceiling Construction.

3. Wall and ceiling expansion joint material.

4. Drywall finishing (joint tape and compound treatment).

1.03 RELATED WORK

A. Masonry work is included in Division 4.

B. Section 06200 - Finish Carpentry.

C. Section 07200 - Insulation.

D. Section 09900 - Painting and Coating.

1.04 QUALITY ASSURANCE

A. Gypsum Board Terminology Standard: GA-505 by Gypsum Association.

B. Single-Source Responsibility: Obtain gypsum board products from a single manufacturer, or from manufacturers recommended by the primer manufacturer of gypsum boards.

C. Perform gypsum boards system work in accordance with recommendations of the following, unless otherwise specified in this section.

1. GA 216 - Recommended Specifications for the Application and Finishing of Gypsum Board.

2. ASTM C754 - Installation of Steel Framing Members to Receive Screw-attached Gypsum Wallboard, Backing Board, or Water-Resistant Backing Board.

D. Acceptable manufacturers include U.S.G., Gold Bond, or equal.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside under cover and in manner to keep them dry, protected from weather, direct sunlight, surface contamination, corrosion and damage from construction traffic and other causes. Neatly stack gypsum boards flat to prevent sagging.

C. Handle gypsum boards to prevent damage to edges, ends of surfaces. Protect metal corner beads and trim from being bent or damaged.

1.06 PROJECT CONDITIONS

A. Environmental Requirements, General: Comply with requirements of reference gypsum board application standards and recommendations of gypsum board manufacturer, for environmental conditions before, during and after application of gypsum board.

B. Cold Weather Protection: When ambient outdoor temperatures are below 55 deg. F (13 deg. C) maintain continuous, uniform, comfortable building working temperatures of not less than 55 deg. F (13 deg. C) for a minimum period of 48 hours prior to, during and following application of gypsum board and joint treatment materials or bonding of adhesive.

C. Ventilation: Ventilate building spaces as required to remove water in excess of that required for drying of joint treatment material immediately after its application. Avoid drafts during dry, hot weather to prevent too rapid drying.

PART 2 - PRODUCTS

2.01 METAL SUPPORT MATERIALS

A. Ceiling Support Materials and Systems

1. General: Size ceiling support components to comply with ASTM C754 ASTM C685 and ASTM E119 unless otherwise indicated.

2. Main Runners: Steel channels with rust inhibitive paint finish, hot or cold-rolled.

B. Wall/Partition Support Materials:

1. Studs: ASTM C-645; 0.0179" min. thickness of base metal unless otherwise indicated.

   a. Depth of Section: 3-5/8" except as otherwise indicated.

   b. Runners: Match stud; type recommended by stud manufacturer for floor and ceiling support of studs, and for vertical abutment of drywall work at other work.

2. Fasteners for Furring Members: Type and size recommended by furring manufacturer for substrate and application indicated.

2.02 GYPSUM BOARD PRODUCTS

A. Gypsum Wallboard: ASTM C-36, of types, edge configuration and thickness indicated below; in maximum lengths available to minimize end-to-end butt joints.

1. Type: Regular Type.

2. Type: Moisture and Mold Resistant.

3. Edges: Tapered.

4. Thickness: 5/8", unless otherwise indicated.

2.03 TRIM ACCESSORIES

General: Provide manufacturer's standard trim accessories of types indicated by drywall work, formed of galvanized steel unless otherwise indicated, with either knurled and perforated or expanded flanges for nailing or stapling, and beaded for concealment of flanges in joint compound. Provide corner beads, L-type edge trim-beads, U-type edge trim beads, special L-kerf-type edge trim-beads, and one-piece control joint beads.

2.04 JOINT TREATMENT MATERIALS

A. General: ASTM C-475; type recommended by the manufacturer for the application indicated, except as otherwise indicated.

B. Joint Tape: Paper reinforcing tape.

C. Joint Compound:

1. Ready-mixed vinyl-tape for interior use.

2. Grade: 2 separate grades; one specifically for bedding tapes and filling depressions, and one for topping and sanding.

D. Water-Resistant Joint Compound: Special water-resistant type for treatment of joints, fastener heads and cut edges of exterior grade backing board.

2.05 MISCELLANEOUS MATERIALS

A. General: Provide auxiliary materials for gypsum drywall work of the type and grade recommended by the manufacturer of the gypsum board.

B. Gypsum Board Screws: Comply with ASTM C-646.

PART 3 - EXECUTION

3.01 PREPARATION FOR METAL SUPPORT SYSTEMS

A. Ceiling Anchorages: Coordinate work with structural ceiling work to ensure that inserts and other structural anchorage provisions have been installed to receive ceiling hangers.

B. Furnish devices to other trades for installation well in advance of time needed for coordination with other work.

3.02 INSTALLATION FOR METAL SUPPORT SYSTEMS - GENERAL

A. Metal Support Installation Standard: Comply with ASTM C-754.

B. Do not bridge building expansion joints with support system, frame both sides of joints with furring and other support as indicated.

C. Screw furring members to wood framing as indicated.

D. Install auxiliary framing at termination of drywall work, and at openings for light fixtures and similar work, as required for support of both the drywall construction and other work indicated for support thereon.

3.03 GENERAL GYPSUM BOARD INSTALLATION REQUIREMENTS

A. Gypsum Board Application and Finishing Standards: ASTM C-840 and GA-216.

B. Locate exposed end-butt joints as far from center of walls and ceiling as possible, and stagger not less than 1'-0" in alternate courses of board.

C. Install ceiling boards in the direction and manner which will minimize the number of end-butt joints, and which will avoid end joints in the central area of each ceiling. Stagger end joints at least 1'-0".

D. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16" open space between boards. Do not force into place.

E. Located either edge or end joints over supports, except in horizontal applications or where intermediate supports or gypsum board back-blocking is provided behind end joints. Position boards so that like edges abut, tapered edges against tapered edges and mill-cut or field-cut ends against mill-cut or field-cut ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.

F. Attach gypsum board to supplementary framing and blocking provided for additional support at openings and cutouts.

G. Form control joints and expansion joints with space between edges of boards, prepared to receive trim accessories, where applicable.

H. Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide 1/4" to 1/2" space and trim edge with J-type semi-flushing edge trim. Seal joints with acoustical sealant.

I. Space fasteners in gypsum boards in accordance with referenced standards and manufacturer's recommendations, except as otherwise indicated.

3.04 INSTALLATION OF DRYWALL TRIM ACCESSORIES

A. General: Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports. Otherwise, fasten flanges by nailing or stapling in accordance with manufacturer's instructions and recommendations.

B. Install metal corner beads at external corners of drywall work.

C. Install metal edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed, and except where plastic trim is indicated. Provide type with face flange to receive joint compound except where semi-finishing type is indicated. Install L-type trim where work is tightly abutted to other work, and install special kerf-type where other work is kerfed to receive long leg of L-type trim. Install U-type trim where edge is exposed, revealed, gasketed, or sealant-filled (including expansion joints).

D. Install metal control joint (beaded-type) where required by gypsum board manufacturer.

3.05 INSTALLATION OF DRYWALL FINISHING

General: Apply treatment at gypsum board joints (both directions), flanges of trim accessories, penetrations, fastener heads, surface defects and elsewhere as required to prepare work for decoration.

Prefill open joints and rounded or beveled edges, if any, using type of compound recommended by manufacturer.

A. Apply joint tape at joints between gypsum boards, except where at trim accessory is indicated.

B. Apply joint compound in 3 coats (not including prefill of opening in base), and sand between last 2 coats and after last coat.

3.06 PROTECTION OF WORK

Provide final protection and maintain conditions, in a manner suitable to Installer, which ensures gypsum drywall work being without damage or deterioration at time of substantial completion.

- END OF SECTION -

SECTION 09510

ACOUSTICAL TREATMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to work of this section.

1.02 WORK INCLUDED

A. Extent of each type of acoustical treatment work to include acoustical panels, suspension systems, anchors, hanger wire, accessories, etc., is shown or scheduled on the Drawings and specified herein. All manufacturers furnishing acoustical materials must be members of the Acoustical Materials Association.

B. Types of acoustical treatments specified in this section include the following:

1 Type I: 2' x 2' acoustical panel with rabbeted edge, suspended.

1.03 RELATED WORK

A. Coordinate work with other trades in connection with this section.

B. Related work specified elsewhere:

1. Division 7 - Thermal and Moisture Protection
2. Division 9 - Finishes
3. Division 15 - Mechanical
5. Division 16 - Electrical

1.04 SAMPLES

Provide samples showing full range of colors, textures, and patterns available for each component.

A. Suspension systems for acoustical panels.

B. Acoustical panels.

1.05 SHOP DRAWINGS

Furnish shop drawings to the Architect for approval, incorporating the following:

A. Show all lighting fixtures, speakers, etc., that build in or fasten to acoustical ceilings.

B. Show all grilles that build into acoustical ceilings.

C. Show panel layout with dimensions of all cut tile at wall and other adjoining items.

D. All shop drawings shall be approved before any acoustical material or suspension systems are installed.

E. Show and locate all access for Mechanical, Electrical, and A.C. controls, valves, and cleanouts.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination of other causes.

B. Damaged or deteriorated materials should be removed from the premises.

C. Before installing acoustical ceiling units, permit them to reach room temperature and stabilized moisture content.

D. Handle acoustical ceiling units carefully to avoid chipping edges or damaging units in any way.

1.07 PROJECT CONDITIONS

Space Enclosure: Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is completed, and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

1.08 QUALITY ASSURANCE

A. The installation of all acoustical material shall be by an acoustical contractor approved by the manufacturer of the acoustical material and the Contractor shall be thoroughly experienced in the work. No work is to be started until all glazing has been completed and all exterior openings closed in. All wet work, including cement, painting, etc., shall be completed and dried out to the satisfaction of the acoustical contractor before work is started. If the Contractor accepts areas not properly dried, he shall assume responsibility for same. Temporary or permanent heat shall be furnished by the General Contractor to provide uniform temperature of at least 60 degrees F., before, during, and after installation of acoustical material.

B. Requirements of regulatory agencies: Codes and regulations of authorities having jurisdiction.

C. Source quality control - Test reports: Manufacturer will provide test certification for minimum requirements.

D. References:

1. ASTM C635 and C636.

2. Manufacturing and installation of suspended ceilings.

3. ASTM C423: Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

4. CISCA Ceiling Systems Installation Handbook.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

The following specified acoustical treatment types are manufactured by U.S. Gypsum. Other acceptable manufacturers include: Armstrong, Conwed Corp. and National Gypsum

2.02 ACOUSTICAL CEILING UNITS

A. Type I:

1. Conform with and meet ASTM E1264 Type III, Form 1 units, Pattern E, Class A - flame spread 25 or less.

2. USG Interiors, Inc. Eclipse Premier Shadowline 1" x 2' x 2' Item 71875 - color to be selected by Architect from standards available. Noise reduction coefficient minimum .75-.85 with sound transmission class 40-44, high humidity resistant - with 10 year no sag warranty.

3. Metal Suspension System

   a. USG/Donn DX-24 double web exposed type grid system 1-1/2" high, 15/16" exposed bottom flange - intermediate duty according to ASTM C635, color to match be white.

   b. Prestretched 12-gauge hangerwire.

   c. MAC-2 clips.

PART 3 - EXECUTION

3.01 INSPECTION

A. Examine areas to receive ceiling tile/ceiling panels for conditions that will adversely affect installation. Provide written report of discrepancies.

B. Do not start work until unsatisfactory conditions are corrected.

C. Work to be concealed: Verify work above ceiling is complete and installed in manner that will not affect layout and installation of ceiling tile/ceiling panels.

D. Beginning of installation shall signify acceptance of conditions in areas to receive ceiling tile/ceiling panels.

3.02 PREPARATION

Field dimensions must be verified prior to installation.

3.03 INSTALLATION

A. Standard reference: Install ceiling tile/ceiling panels and suspension system, including necessary hangers, grillage, splines and other supporting hardware in accordance with ASTM C636.

B. The layout of acoustical materials and/or suspensions systems, shall be properly planned and laid out, in accordance with approved shop drawings. Start all work at the center point approved shop drawings. Start all work at the center point of areas unless otherwise shown on the reflected ceiling plans.

C. Properly anchor all hanger wire to bottom structural steel, as hereinbefore specified.

D. Properly anchor all perimeter edge angles with concrete nails.

E. All systems shall be level, to ceiling heights shown on the drawings.

F. Do all necessary cutting required at corners, angles, etc., and as required for complete installation.

G. Install all acoustical units with grain and fissure in one direction. Use arrow or guide notch on back of the units for orientation.

3.04 SUSPENSION SYSTEMS

A. Install direct hung suspension system for acoustical tile in accordance with ASTM C636 except as specified herein. Deflection is not to exceed 1/360 on span of main and cross runner. Maximum spacing of hangers to be four feet on centers. Provide extra hangers at each corner of mechanical, electrical and miscellaneous equipment supported by the ceiling suspension system.

B. Attach hanger wires directly to structure above.

C. Exposed pop rivets will not be permitted.

D. Install perimeter seal between vertical leg of wall molding and finish wall and other adjacent vertical surfaces.

3.05 WORKMANSHIP

All acoustical ceilings shall be installed by mechanics thoroughly experienced in this type of work and in strict accordance with the methods outlined under this Section, or by similar methods approved by the Architect.

3.06 CLEANING

Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members; comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

3.07 GUARANTEE

The Contractor shall guarantee all acoustical material to remain level and securely fastened, for a period of one (1) year after acceptance by the Architect. Any defects during that period, shall be repaired at no additional cost to the Owner.

- END OF SECTION -

SECTION 09650

RESILIENT FLOORING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Furnish all labor, materials and equipment required to install resilient flooring systems. The extent of resilient flooring work is indicated on the drawings and schedules.

B. Type of Work Included

1. Preparation of substrate surfaces.

2. Application of vinyl base.

3. Application of vinyl composition tile, as indicated on the drawings and schedules.

4. Cleaning of all surfaces and areas of work.

1.02 REFERENCES

Flooring, vinyl composition tile, ASTM F-1066-87, Type IV Composition 1.

1.03 SUBMITTALS

A. Submit product data, under provisions of Section 01300.

B. Submit samples to include duplicate 2 x 2 inch sized samples of each flooring material, color, and pattern, for selection by the Architect.

C. Include duplicate 2-inch long samples for base selection.

1.04 ENVIRONMENTAL REQUIREMENTS

A. Maintain minimum 70 degrees F air temperature at flooring installation area for three days prior to, during and for 24 hours after installation.

B. Store flooring materials in area of application. Allow three days for material to reach equal temperature as area.

1.05 EXTRA STOCK

A. Deliver one carton of each color and pattern of floor tile material required for project for maintenance.

B. Clearly identify each box.

C. Deliver 24 lin. ft. of each color and type of vinyl base material required for project for maintenance use.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Armstrong, Inc.

B. Kentile, Inc.

C. Flexco Division, Textile Rubber Co.

D. Tarkett, Inc.

2.02 FLOOR COVERING MATERIALS

Vinyl Composition Tile shall comply with the following: Type IV; 12" x 12"; gauge 1/8"; ASTM F-1066; Composition 1 and Class 2; Kentile Architectural standard and premium series; Tarkett Signals or Expression collection, excluding solid vinyl. Submit two samples of full line of available colors, patterns and texture for selection by Architect of field and accent.

2.03 BASE MATERIALS

Base: 4-inch; Type II vinyl; topset coved, for use with resilient floors1/8-inch thick, including premolded end stops and external corners; Tarkett, Fashion Cove, Kentile Groups I and II, or equal; submit two samples of full line of available colors for selection by Architect.

2.04 ACCESSORIES/ADHESIVES/SEALERS

A. Sub-Floor Filler: White premix latex, mix with water to produce cementitious paste.

B. Primers and Adhesives: Waterproof; of types recommended by resilient flooring manufacturer for specific material to be Tarkett FB 1, 20, 30, 40, or 50, or approved equal.

C. Sealer and Wax: Type recommended by resilient flooring material manufacturer for material type and location.

PART 3 - EXECUTION

3.01 INSPECTION

A. Ensure floor surfaces are smooth and flat with maximum variation of 1/8 inch in 10 feet.

B. Ensure concrete floors are dry (maximum 7 percent moisture content) and exhibit negative alkalinity, carbonization, or dusting.

3.02 PREPARATION

A. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.

B. Clean floor and apply trowel and float filler to leave smooth, flat hard surfaces. Prohibit traffic until filler is cured.

C. Check vertical gypsum board surfaces where base is to be applied and verify that there area no ridges or gaps in the surface that would prevent a smooth and even base installation.

3.03 INSTALLATION - FLOORING

A. Ensure shade variations do not occur within any one area.

B. Clean substrate. Spread cement evenly in quantity recommended by manufacturer to ensure adhesion over entire area of installation. Spread only enough adhesive to permit installation of flooring before initial set.

C. Coordinate grain direction with Architect.

D. Set flooring in place, press with heavy roller to ensure full adhesion.

E. Lay flooring with joints and seams parallel to building lines to produce minimum number of seams.

F. Install with minimum number of seams.

G. Terminate resilient flooring at centerline of door openings where adjacent floor finish is dissimilar.

H. Scribe flooring to walls, columns, cabinets, floor outlets and other appurtenances to produce light joints, except at expansion joint conditions and other expansion conditions in project areas.

3.04 INSTALLATION - BASE

A. Fit joints tight and vertical. maintain minimum measurement of 18 inches between joints.

B. Miter internal corners. Use premolded sections for external corners and exposed ends.

C. Install base on solid backing. Adhere tightly to wall and floor surfaces.

D. Scribe and fit to door frames and other obstructions.

E. Install straight and level to variation of plus or minus 1/8 inch over 10 feet.

F. Do not install base in lengths less than 12 inches. Even all joints at cut conditions.

3.05 PROTECTION

Prohibit traffic from floor finish for 48 hours after installation.

3.06 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces.

B. Clean, seal and wax floor and base surfaces in accordance with manufacturer's instructions.

- END OF SECTION -

SECTION 09900

PAINTING AND COATINGS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Furnish all labor, materials, equipment and services required to do all painting, including preparation, priming and protection of finished surfaces. An extensive and comprehensive painting job will be required and shall include all surfaces which normally are painted, including all exposed structural steel, interior and exterior. The extent of painting and coatings is indicated in this Section.

B. Extent of Work Includes:

1. All miscellaneous ferrous metals.

2. All safety standard color coding of mechanical and electrical items as scheduled.

3. Interior gypsum board surfaces.

C. Cooperate & Coordinate with all other trades in executing the work described in this section.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Division 1 - General Requirements.

B. Division 5 - Metals.

C. Division 6 - Wood and Plastics.

D. Division 7 - Thermal and Moisture Protection.

E. Division 8 - Windows and Doors.

F. Section 09940 - Shop Painting.

H. Division 15 - Mechanical.

I. Division 16 - Electrical.

J. Wherever detailed painting requirements are covered under an equipment or product specification, those painting requirements shall govern over the Specifications herein, with respect to surface preparation, paint materials, coats, thicknesses and coverage.

1.03 REQUIREMENTS

A. It is the intent of these Specifications that the Contractor shall paint all exposed miscellaneous metal, doors, panels, lintels, equipment, piping, electrical conduit and all other work obviously required to be painted unless otherwise specified. The omission of minor items in the schedule of work shall not relieve the Contractor of his obligation to include such items where they come within the general intent of the Specifications as stated herein.

B. The Contractor shall review and examine all Divisions and Sections of these Specifications for any additional painting requirements and/or additional surfaces or items to be painted.

C. Refer to the Room Finish Schedule for various interior building surfaces required to be painted.

D. Apply specified finish coats of paint to all pre-primed work and complete finishing system for unprimed work required to be painted.

1.05 DEFINITIONS

A. The term "paint" as used herein includes enamels, paints, sealers, fillers, emulsions, and other coatings.

B. MDMTPC = Minimum Dry Mil Thickness Per Coat.

C. MDFT = Minimum Dry Film Thickness.

D. SSPC = Steel Structures Painting Council.

1.06 SUBMITTALS

A. Manufacturer Name: Contractor shall submit manufacturer's name and brand of coating materials proposed to be used for field painting of this project within 60 days of Notice to Proceed date.

B. Materials List:

1. Before any materials are delivered to the job site, submit to the Architect/Engineer a complete list of all materials proposed to be furnished including quantities, types and descriptions of paint for each part of the project. Material list shall make reference to the specified paint systems and the painting schedule for each paint product proposed to be used, indicating type of surface to be painted, building or location and system as specified. In cases where paint materials other than those described in the Specifications are proposed, a materials list will not be considered as acceptance of such substitute materials; further data will be required as specified herein.

2. Two (2) copies of the full range of colors available in each of the proposed products shall be submitted with the materials list.

1.07 QUALITY ASSURANCE

A. Qualification of Painters: All painting shall be done by qualified, skilled, experienced painters specializing in industrial or heavy commercial painting. In the acceptance or rejection of completed painting, no allowance will be made for lack of skill on the part of the painters.

B. Paint Labels: Labels on paint containers shall include the following:

1. Manufacturer's name.

2. Generic type of paint.

3. Manufacturer's stock number.

4. Color.

5. Instructions for thinning where applicable.

C. Compatibility:

1. The Contractor shall be responsible for the compatibility of all paints used in the work. A compatible paint will be considered a paint which precludes adverse effects related to bonding, drying delamination, scaling, lifting, and bleeding.

2. In cases where shop-applied primers and coatings on materials and equipment furnished by suppliers are products different from those described in the Specifications, the Contractor shall verify compatibility with the specified field-applied coating system.

1.08 PRODUCT DELIVERY, HANDLING AND STORAGE

A. Delivery: All materials shall be brought to the job site in the original sealed and labeled containers of the paint manufacturer and shall be subject to inspection by the Engineer. All labels shall be legible and intact at time of use.

B. Manufacturer's Instructions: Paint manufacturer's written instructions for proper surface preparation, mixing, thinning, application and drying shall be furnished with the paint, available at all times at the job site, and strictly followed.

1.09 JOB CONDITIONS

A. Environmental Requirements:

1. Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be applied.

2. Do not apply finish in areas where dust is being generated.

B. Climatic Conditions: Paint shall not be applied if:

1. The ambient temperature or temperature of surface to be painted is below 50 degrees F or below the temperature recommended by the paint manufacturer.

2. The relative humidity is above 85%.

3. The relative humidity is such that the paint will not dry properly as determined by the Engineer.

C. Protection:

1. Protect with drop cloths, masking or other acceptable means all surfaces which could be damaged in function or appearance by paint, including surfaces not being painted concurrently and surfaces not to be painted.

2. Hardware, accessories, fixtures and similar items shall be removed and replaced after completion of painting.

3. Spray painting will not be permitted when it will cause damage to adjacent or otherwise located surfaces.

4. All paint spatters on glass shall be wiped off immediately.

PART 2 - PRODUCTS

2.01 PAINTS

A. Paint products are listed herein under "Painting and Coating Schedule". All paints of a system shall be by one (1) manufacturer.

B. The paints listed for architectural surfaces are products of DeVoe. Paints are specified as a "standard of quality" only.

C. The paints listed under Process Painting and Coatings Schedule are products of Tnemec. Paints are specified as a "Standard of Quality" only.

D. Similar paints and painting systems produced by Porters, Sherman-Williams, Glidden, or equal, may be substituted subject to review by the Engineer and subject to the provisions specified herein.

E. Paints containing lead that surpass Federal maximum levels shall not be allowed. Oil shall be pure boiled linseed oil.

F. Paints shall conform to current air pollution regulations and standards.

2.02 COLORS

A. The manufacturer shall be able to furnish all paints for exposed surfaces in a wide range of colors and lighter and darker shades of these colors from which the Engineer will select the colors required on the various surfaces.

1. Safety Color Codes: Comply with Occupational Safety and Health Administration Standards, as applicable, regarding safety color codes.

2. Piping Color Codes: Colors for process pipe coding will be selected by the Engineer from proposed paint manufacturer's color selections. Pumps, meters, valves, etc., shall be painted the same color as the line in which they are a part.

B. Unless otherwise specified, PVC plastic piping shall not be painted, but shall be stenciled and labeled or tagged for identification purposes. Color of plastic pipe material shall be uniform along the length of each particular plastic pipe line.

PART 3 - EXECUTION

3.01 INSPECTION

A. Examine surfaces scheduled to receive paint and/or coating finishes for conditions that will adversely affect application, permanence or quality of work and which cannot be put into an acceptable condition through surface preparation.

B. Do not proceed with surface preparation or coating application until conditions are suitable.

3.02 ACCEPTANCE OF SURFACES

The commencement of painting work in any area or space will be construed as acceptance by the Contractor of the surface as being satisfactory and if improper adhesions or surface finish occur the surface shall be corrected at no additional cost to the Owner.

3.03 STORING AND MIXING

All painting materials shall be stored and mixed in a single place designated by the Engineer for this purpose. The Contractor shall not use any plumbing fixture or pipe for mixing or for disposal of any refuse material. He shall carry to his mixing room all water necessary and shall dump all waste outside of the building into a suitable receptacle, so as not to create hazards or damage. The Contractor will be held responsible for all damage due to his failure to observe these provisions.

3.04 PREPARATION OF SURFACES

A. General:

1. Before any surface is painted, it shall be cleaned carefully of all dust, dirt, grease, loose rust, mill scale, old weathered paint unsuitable for top coating, efflorescence, oil, moisture, or other foreign matter and condition to coating bond and life. All necessary special preparatory treatment shall then be applied in strict accordance with the paint manufacturer's written instructions. Where required, imperfections and holes in surfaces to be painted shall be filled in an acceptable manner.

2. For non-ferrous metals and concrete, surface preparation shall be as follows, but not less than that required by the paint manufacturer.

3. References to SSPC refer to Steel Structures Painting Council specifications.

4. Surfaces shall be primed and/or treated, as specified, as soon after completion of surface preparation as practicable, but in any event before any visible or detrimental corrosion or contamination occurs. A prepared surface, which becomes corroded or contaminated, shall be re-prepared before treating and/or priming at no additional cost to the Owner.

3.05 COMPATIBILITY OF SHOP AND FIELD PAINTS

A. To ensure a satisfactory painting job it is essential that the paints applied in the shop and in the field be mutually compatible.

3.09 CLEANING

A. During the progress of the work, do not allow the accumulation of empty containers or other excess items except in areas specifically reserved for that purpose.

B. Take all precautions to prevent accidental spillage of paint materials. In event of spilling, immediately remove all spilled materials and the waste and other equipment used to clean up the spill, and wash surfaces to their original undamaged condition.

C. Touch up and restore finish where damaged.

D. Remove all trash and accumulated materials of a painting nature from the premises at the completion of the work.

E. Paint spots, oil or stains upon adjacent surfaces shall be removed. Any damage to work of other trades or equipment caused from painting shall be made good at no expense to the Owner.

F. Do not mar surface finish of items being cleaned.

G. Leave entire job clean (including paint storage space) and acceptable to the Engineer.

3.13 EXTERIOR ARCHITECTURAL PAINTINGS AND COATINGS SCHEDULE

General: Provide the following paint systems for various substrates as indicated on drawings.

A. Exterior System A: Ferrous Metal/Alkyd Gloss Finish

1. First Coat: Metal primer 13101 Mirrolac coverup.
2. Second Coat: 70XX Mirrolac interior/exterior alkyd enamel.
3. Third Coat: 70XX Mirrolac interior/exterior alkyd enamel.

B. Exterior System B: Zinc coated metal/alkyd gloss enamel.

1. First Coat: 13201 Mirrolac galvanized metal primer.
2. Second Coat: 70XX Mirrolac coverup.
3. Third Coat: 70XX Mirrolac coverup.

3.14 INTERIOR ARCHITECTURAL PAINTING AND COATINGS SCHEDULE:

General: Provide the following paint systems for various substrates as indicated on drawings.

A. System A: Interior ferrous metal/alkyd gloss finish.

1. First Coat: Metal primer 13101 Mirrolac coverup.
2. Second Coat: 70XX Mirrolac interior/exterior alkyd gloss finish.
3. Third Coat: 70XX Mirrolac interior/exterior alkyd gloss finish.

B. System B: Interior gypsum finishes construction/latex flat.

1. First Coat: 50801 vinyl latex primer sealer.
2. Second Coat: 36XX Wondertone latex flat.
3. Third Coat: 36XX Wondertone latex flat.

- END OF SECTION -

DIVISION 10

SPECIALTIES

SECTION 10440

SIGNS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

The general provision so the Contract, including General and Special Conditions, apply to the work in this Section.

1.02 DESCRIPTION OF WORK

The extent of signs to be furnished and installed is specified herein.

1.03 SUBMITTALS

A. Submit manufacturer's literature giving specifications of materials, design, installation, etc., to the Architect for approval prior to furnishing any materials.

B. Submit full size sample units if required by the Architect. Acceptable units may be installed as part of the work.

PART 2 – MATERIALS

2.01 SIGNS

A. Panel Signs:
   1. Interior Panel Signs:
      a. Material: Acrylic sheet
      b. Frame: Frameless
      c. Mounting: Wall with two-face tape.
      d. Color: As selected by Architect from manufacturer's full range
      e. Number: Provide plastic door identification for the following spaces:
         Unisex Handicap Toilet
         Unisex Toilet
         Shower Room
         ADA requirements, including raised Braille, and include graphics for Toilet Rooms.
   2. Exterior Panel Signs:
      a. Material: Aluminum sheet
      b. Frame: Framed
      c. Mounting: Wall.
      d. Color: As selected by owner.
      e. Number: Provide one exterior building sign aluminum with vinyl-cut graphics.

B. Applied Vinyl: Die-cut characters from vinyl film applied to exposed face of panel sign

C. Plaque: 18" x 18" x 1/8" stain brass machinge engraved and paint filled, #228577 by Best Sign Systems, Inc. (1-970-249-2378) or equal. Lettering to be determined by Owner.

2.02 FINISHES

A. Aluminum: Mill finish.

B. Acrylic Sheet: Copy and background and frame colors that are UV and water-resistant for one year.

PART 3 - EXECUTION

3.01 INSPECTION

Installer must examine the substrates and conditions under which the specialty signs are to be installed and notify the Contractor 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 installer.

3.02 INSTALLATION

A. Install sign units and components at the locations shown or scheduled, securely mounted with concealed theft-resistant fasteners, unless otherwise indicated. Attach signed to substrate in accordance with the manufacturer's instructions, unless otherwise shown.

B. Install level, plumb and at the property height. Cooperate with other trades for installation of sign units to finish surfaces. Repair or replace damaged units as directed by the Architect.

- END OF SECTION -

SECTION 10520

PORTABLE FIRE EXTINGUISHERS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Definition: "Fire extinguishers" in this section refers to 10-pound capacity, dry chemical fire extinguisher units that can be hand-carried as opposed to those which are equipped with wheels or to fixed fired extinguishing systems.

B. Type of products in this section include:

1. Dry Chemical Fire extinguishers for Class A, B, and C fires.

2. Mounting brackets.

1.02 QUALITY ASSURANCE

A. Provide portable dry chemical fire extinguishers and accessories by one manufacturer, unless otherwise acceptable to Architect/Engineer.

B. UL Listed Products: Provide new portable fire extinguishers which are approved by Factory Mutual Research Corporation for type, rating, and classification of extinguishers indicated and carry appropriate FM marking.

1.03 SUBMITTALS

Product Data: Submit manufacturer's technical data and installation instructions for all portable fire extinguishers required.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

Manufacturer: Subject to compliance with requirements, provide product of one of the following:

A. J. L. Industries

B. Larsen's Mfg.

C. Muckle Manufacturing, Division of Technico, Inc.

D. Profile International, Inc.

E. Or manufacturer producing an equivalent product.

2.02 FIRE EXTINGUISHERS

A. General: Provide fire extinguishers for locations indicated on the Drawings, in colors and finishes selected by Architect from manufacturer's standard, which comply with requirements of governing authorities.

B. Abbreviations indicated below to identify extinguisher types related to UL classification and rating system and not, necessarily, to type and amount of extinguishing material contained in extinguisher.

C. Multi-Purpose Dry Chemical Type (4A-60BC-FE): UL rated 4-A:60-B:C, 10 lb. nominal capacity, in enameled steel container, for Class A, Class B and Class C fires.

2.03 MOUNTING BRACKETS

Provide manufacturer's standard bracket designed to prevent accidental dislodgement of extinguisher, of proper size for type and capacity of extinguisher indicated, in manufacturer's standard plated finish.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install items included in this section in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities.

1. Securely fasten mounting brackets and cabinets to structure, square and plumb, to comply with manufacturer's instructions.

2. Where exact location of bracket-mounted fire extinguishers not indicated, locate as directed by Architect.

B. Check extinguishers for proper charge and operation.

C. Remove and replace damaged, defective or under charged units.

3.02 IDENTIFICATION

Identify extinguishers with red letters on white vinyl (14" x 10") signs spelling "FIRE EXTINGUISHER" applied to wall surface. Letter size, style and location as selected by Engineer.

- END OF SECTION -

SECTION 10800

TOILET ACCESSORIES

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Extent of each type of toilet accessory is indicated on drawings and schedules.

B. Types of toilet accessories required include the following:

1. Combination Towel Dispenser/Waste Receptacle
2. Soap Dispenser
3. Mirror
4. Toilet Paper Holder
5. Mop and Broom Holder
6. Grab Bars

1.02 QUALITY ASSURANCE

A. Inserts and Anchorages: Furnish inserts and anchoring devices.

B. Accessory Locations: Coordinate accessory locations with other work to avoid interference and to assure proper operation and servicing of accessory units.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's technical data and installation instructions for each toilet accessory.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

Manufacturer: Subject to compliance with requirements, provide toilet accessories by one of the following:

A. A&J United Machine & Metal Products Corp.

B. Accessory Specialties, Inc.

C. American Dispenser Co., Inc.

D. Bobrick Washroom Equip., Inc.

E. Bradley Corp.

F. McKinney/Kidde, Inc.

2.02 MATERIALS, GENERAL

A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 22 gage minimum, unless otherwise indicated.

B. Brass: Leaded and unleaded, flat products; Rods, shapes, foregoings, and flat products with finished edges.

C. Sheet Steel: Cold rolled, commercial quality ASTM A 366, 20 gage minimum, unless otherwise indicated. Surface preparation and metal pretreatment as required for applied finish.

D. Galvanized Steel Sheet: ASTM A 527, G60.

E. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B 456, Type SC 2.

F. Galvanized Steel Mounting Devices: ASTM A 386, hot-dip galvanized after fabrication.

G. Fasteners: Screws, bolts, and other devices of same material as accessory unit or galvanized steel where concealed.

2.03 FABRICATION

A. General: Stamped names or labels on exposed faces of toilet accessory units are not permitted, except where otherwise indicated; unobtrusive labels on surfaces not exposed to view are acceptable. Where locks are required for a particular type of toilet accessory, provide same keying throughout project. Furnish two keys for each lock.

B. Surface-Mounted Toilet Accessories, General: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed wherever possible.

2.04 SCHEDULE

A. Combination Towel Dispenser / Waste Receptacle: Surface mounted stainless steel combination unit. Towel compartment in upper portion of unit designed to dispense not less than 400 C-fold or 700 multi-fold paper towels. Waste receptacle in lower portion of unit provided with reusable heavy-duty liner, minimum 4-gallon capacity. Provide flush doors with piano hinges and tumbler locks on upper and lower compartments. Provide one each in rooms 105, 107 and 108.

B. Toilet Tissue Dispenser: Surface-mounted, double-roll dispenser, sized to accommodate two separate rolls of core type tissue to 5" diameter. When first roll is used up, fresh roll automatically drops down for user. Cabinet and service door to be type 304 (18-8), 22-gage stainless steel with exposed surfaces in architectural stain finish. Service door to be tumbler lock keyed and hinged at the bottom. Spindles of molded polyethylene. Provide one each in rooms 105, 107 and 108.

C. Soap Dispenser: Surface-mounted liquid soap dispenser, approximately 5" w x 8" h x 3" deep, with 40-oz. liquid capacity. Body to be fabricated of type 304 (18-8) 22-gage stainless steel with exposed surfaces in architectural satin finish. Concealed mounting with vandal-

resistant filler hole cover and sight gauge. Soap valve has chrome plated bras housing with ABS plastic mechanism. Provide one each in rooms 105, 107 and 108.

D. Mirror in Stainless Steel Frame: ¾" x ¾" stainless steel angle with satin finish, mitered corner frame. No. 1 quality, ¼" float / plate glass selected impact plastic filler strips; back is protected by full size shock absorbing, waterproof, non-abrasive 1/8" thick polyethylene padding. Provide 36" x 48" mirrors at rooms 105, 107 and 108.

E. Mop and Broom Holder: 22-gage (.050") Type 302 stainless steel "hat" channel with spring-loaded rubber cam type mop / broom holders. Provide 36" long unit with four (4).

F. Stainless steel grab bars at toilet 105.

PART 3 - EXECUTION

3.01 INSTALLATION

Install toilet accessory units in accordance with manufacturer's instructions, using fasteners which are appropriate to substrate and recommended by manufacturer of unit. Install units plumb and level, firmly anchored in locations and at heights indicated, and or all.

3.02 ADJUSTING AND CLEANING

A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.

B. Clean and polish all exposed surfaces after removing labels and protection coatings.

- END OF SECTION -

DIVISION 11

EQUIPMENT

SECTION 11000

BANK EQUIPMENT

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 specifications apply to work of this section.

1.02 SUMMARY

A. Work includes providing and installing bank equipment as specified in this section and indicated on the Drawings. Work shall be coordinated with electrical requirements of this section.

1.03 SUBMITTALS

A. Submit manufacturer's literature giving specifications of materials, design, installation, etc. to the Architect for approval prior to furnishing any materials.

PART 2 – PRODUCTS

A. Items listed below are manufactured by Diebold (1-800-999-3600). Equal manufacturers are to be approved by the Architect.

B. Drive-up vision window is to be Diebold 234-11 level 1 Econo.

C. Transaction drawer is to be Diebold 121-35 manual level 1. Coordinate speaker requirements with the Electrical Contractor.

D. After-hour depository is to be Diebold 163-60 manual unit **without** cameras. This shall include reinforced concrete housing and chest. The entire unit shall be provided by the contractor.

PART 3 – EXECUTION

A. Installation shall be done in accordance with the manufacturer's instructions and recommendations.

-END OF SECTION-

DIVISION 13

SPECIAL CONSTRUCTION

SECTION 13200

GEOGRAPHIC INFORMATION SYSTEM (GIS)

PART 1 GENERAL

1.01 WORK INCLUDED

A. The contractor shall furnish and provide materials and services to provide field data collection of all the utilities infrastructure listed in this section to a minimum accuracy of 3 foot using Global Positioning Systems (GPS) capable of an accuracy of 1 foot. This will ensure the minimum of accuracy requirements are met. Once field collection is completed all utility information will be transferred into maps (a GIS developed specifically for rural water utilities). Any data that cannot be collected by the field personnel will be turned into SHWD for location and subsequent collection by the contractor. After the data collection and transfer of data into maps is completed, training will be provided to SHWD personnel. This training shall include 2-days training on maps, 2 day training on the use of the GPS equipment and two days of on site consultation. Technical support and product updates will also be provided under an annual maintenance plan. The entire Sandy Hook Water District system shall be collected and processed.

B. The specifications for this scope of work were prepared using as a basis of design

by **Spatial Data Integrations, Inc.** and (MapSync), Louisville, Kentucky, represented by Mr. Trey Lyon (502) 568-2591.

PART 2 PRODUCTS

2.01 HARDWARE

Two laptop computers with following minimum specifications:

- Windows XP Professional SP3
- 1.6 GHz Intel Core Duo, Pentium 4 Xeon Processor
- 1 GB RAM, CD/DVD-ROM
- 64MB Video RAM, 1024 x 768 Screen Resolution
- .NET Framework 2.0

Trimble GeoXH GPS GeoExplorer 2008 series

- Provides real-time subfoot accuracy
- 520 MHz processor, 128 MB RAM, 1GB onboard storage

2.02 SOFTWARE

SDI Maps - Utility Mapping Application

- Maintain Geometric Networks
- Perform valve isolation and identify customer effected
- Create reports based upon predefined water utility templates or custom templates
- Complete geodatabase designed for water utilities by water utilities
- Hyperlink images, documents, URL's to any feature
- Simplified editing tools to include intelligent connectivity rules
- Create custom mapbooks on any size paper
- Standard with basemap data

a. 2ft color aerial photography (source: Kentucky Office of Georgaphic Information by way of Farm Services Administration (FSA)
b. Topographic maps
c. Digital elevation model
d. road network

- Compatible with industry standard GIS file formats

GEOSYNC XG Non-Publisher

- Easy to use and analyze GIS data
- Built custom searches and queries
- Can be used in the office or in a mobile environment
- Add graphic features to emphasis the map view and attach information
- Print and report map view or data view information
- Scalable to grow with your organization

TerraSync

- Trimble Field Software
- Use custom data dictionaries to be productive in the field
- Simple work environment
- Able to view background files (ie aerial photos, shapefiles and cad files)

Pathfinder Office

- Trimble Office Software
- Build custom data dictionaries to be productive in the field
- Post process data in order to obtain higher level of accuracy on your GPS data
- Export GPS data to a variety of formats
- Works with GPS2GIS and TerraSync

GPS2GIS

- Built on ESRI ArcGIS and Trimble Pathfinder Office Technologies
- Streamlines work flow with GPS data working inside of ArcGIS environment
- Analyze and Preview GPS data
- Perform Quality Control checks on your data

2.03 TRAINING

- 2 days on site SDImaps training
- 2 days on site GPS training
- 2 days on site consulting

2.04 FIELD COLLECTION GUIDELINES

- Trimble GeoXH subfoot GPS used to collect data
- Features collected with antenna at center of feature, unless offset is performed in which case measurements will be taken from center of feature
- Data delivered will be minimum of submeter (3 foot or less)
- Field crew will use record drawings (as-builts) to locate utility infrastructure
- If a feature cannot be located by field personnel, SHWD will be notified and will locate the feature at which time field crew will perform collection

2.05 FEATURES TO BE GPS COLLECTED

- System Valves
- Fire Hydrants
- Pump Stations
- Water Tanks
- Blow Offs
- Treatment Plant/Office
- Water Intakes (wells)

2.06 CONSULTATION SERVICES

- Digitize all water mains and services lines into SDImaps based upon data from the record drawings and system valves collected.
- Convert existing information for water meters (X/Y locations) into SDImaps
- Attribute any mains and service lines with material type and size if available
- Publish SDImaps data to GeoSyncXG

2.07 ANNUAL MAINTENANCE PLAN (INCLUDED FOR FIRST YEAR)

- SDImaps and MapSync sofware updates
- GPS technical support (2 years provided)
- *Unlimited phone, email, and remote connection technical support*

- END OF SECTION -

SECTION 13201

METER TEST BENCH

PART 1 GENERAL

1.01 WORK INCLUDED

A. The contractor shall furnish and install materials and services to install a certified standard test bench for water meters as indicated on the drawings and as herein specified. .

PART 2 PRODUCTS

2.01 The meter test bench shall be a Ford 4STB-LR with left to right water flow or approved equal. The bench shall be able to test between one and eight individual units at one time for 5/8", 5/8" x ¾" or 1" meter.

A. Bench shall be adaptable to 1 ½" and 2" meters by means of an optional test clamp.

B. Any meter can be removed and replaced without disturbing other meters.

C. All water passages are brass, with a heavy galvanized steel pan.

D. Contain a Testerate Indicator, flow control valve, blow off valve, discharge tube and electric flow control unit

E. Ball Valve on inlet and outlet lines

F. Pressure gauges on inlet and outlet lines

G. Drain line at bench outlet

H. 18" Copper swinging discharge pipe at outlet

I. One 100 gallon and one 10 gallon calibrated testing tanks w/percentage markings

J. All tanks shall be of galvanized steel and have non-swirling vanes to provide for quick and complete drainage.

K. Gauge glass strip shall be marked in both gallons and cubic feet

L. Red stripe that magnifies the strip for easy reading

PART 3 EXECUTION

3.01 Contractor shall install and make operable to provide certified testing apparatus. One day training of the test bench shall be provided to the owner at no additional costs.

- END OF SECTION -

SECTION 13600

PREFABRICATED METAL BUILDING

PART 1 – GENERAL

1.01 SCOPE OF WORK

Provide all labor, materials, equipment and services necessary to furnish and install concrete foundations, metal siding, standing seam metal roof, liner panels, gutters and downspouts and prefabricated metal building as shown on the Drawings and specified hereinafter.

1.02 DEFINITIONS

Definitions that apply under this Contract are the following:

A. Definitions set forth in the "Recommended Guide Specifications for Metal Building Systems" published by Metal Building Manufacturer's Association (MBMA).

1.03 QUALITY ASSURANCE

A. Qualifications

1. Manufacturer: Regularly engaged in the manufacturing of pre-engineered structures.

2. Design: Building components shall conform to the applicable specifications of the following publications in relation to design requirements and allowable stresses:

   a. "Recommended Design Practices Manual" MBMA.
   b. "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" with all supplements American Institute of Steel Construction.
   c. "Specifications for the Design of Cold-Formed Steel Structural Members" American Iron and Steel Institute.
   d. "Code for Welding in Building Construction" American Welding Society.

3. Welding" Procedures to be in accordance with AWS Structural Welding Code.

B. Requirements of Regulatory Agencies: The metal building supplier shall warrant the building to be in compliance with the following:

1. 2002 Kentucky Building Code and amendments.
2. All applicable Kentucky Standards of Safety.

C. Allowable Tolerances: Allowable tolerances shall be as described in "AISC Code of Standard Practice" with the exception that, for erection purposes, individual members are considered plumb, level and aligned for error does not exceed 1:300, as recommended by MBMA.

D. Design Loads: Design loads shall comply with: The MBMA "Recommended Design Practices Manual"; 2002 Kentucky Building Code, and the design loading criteria indicated in the Contract Drawings.

1.04 SUBMITTALS

A. Shop drawings shall be submitted for review. Shop drawings shall consist of catalog cuts;

design and erection drawings; shop painting and finishing specifications; design reactions, instruction manuals; and other data layouts, construction details, fasteners and erection. The Engineer shall review these documents before fabrication and shipment of the prefabricated metal buildings, design layout drawings shall be signed and sealed by metal building manufacturer with a registered Engineer for the State of Kentucky.

B. The Contractor shall also coordinate all openings supports, frames, etc., which are necessary for the HVAC accessories (heaters, exhausts, louvers, etc.) as shown on the drawings and as specified in Division 15. The building shop drawings shall be coordinated with the HVAC accessories and any support or framing information that is necessary to insure that these accessories will be adequately supported and will not interfere with the structural system of the building and will be included with the building shop drawings.

1.05 WARRANTY

A. Metal Panel Finished: 20 years.

B. Weathertightness for Standing-Seam Metal Roof Panels: 20 years.

PART 2 - PRODUCTS

2.01 GENERAL

A. The design of the structural system shall be a clear or multi-span rigid frame with tapered or straight columns and roof beams, with a gable or monoslope roof. Canopies are to be hip roof.

B. Foundations

1. Foundations including anchor bolt embedment length shall be adequately designed by a competent engineer, retained by the building manufacturer, in accordance with the best recommended practices for the specific soil conditions of the building site.

C. Structrual Framing:

1. Primary Framing: Rigid frame.
2. Frame Configuration: Single gable.
3. End-Wall Framing; Not expandable.
4. Purlins: C- or Z-shaped sections.
5. Girts: C-or Z-shaped sections.
6. Canopy Framing: Purlin-extension type.

D. Metal Roof Panels:

1. Type: Standing seam "BattenLok HS, " 24-gauage, 16" wide, as manufactured by MBCI, or equal.
2. Materials: Zinc-coated (galvanized) steel.
3. Finish: "Signature 300."
4. Uplift Rating: UL 90.

E. Field-Assembled Metal Wall Panels:

1. Type: "Shadow Rib" panels, 24-gauge, 16" wide, as manufactured by MBCI, or equal.
2. Material: Zinc-coated (galvanized) steel.
3. Finish: Signature 200."

F. Exterior Metal Soffit Panels:

1. Type: "PBU panel, 26 gauge, 36" wide, as manufactured by MBCI, or equal.
2. Material: Zinc-coated (galvanized) steel.
3. Finish: "Signature 200."

G. Interior Wall Liner Panels:

1. Type: "PBG" panel, 24 gauge, 36" wide, as manufactured by MBCI, or equal.
2. Material: Zinc-coated (balvanized).
3. Finish: "Signature 200."

H. Thermal Insulation for Field-Assembled Metal Panels: Metal-building type with white vinyl vapor barrier.

I. Accessories:

1. Flashing and trim.
2. Gutters.
3. Downspouts.
4. Splash blocks.

2.02 WELDING

A. Welding procedure, operator qualifications and welding quality standards shall be in accordance with the American Welding Society structural welding code. Inspection other than visual inspection as defined by AWS paragraph 6.9, shall be identified and negotiated prior to bidding.

B. Certification of welder qualification shall be supplied when requested.

C. Welding procedure, operator qualifications and welding testing standards shall be in accordance with the Kentucky building costs for testing shall be by the metal building contractor.

2.03 STRUCTURAL PAINTING

A. General

1. All structural steel shall be prime painted as temporary protection against ordinary atmospheric conditions. Subsequent finish, painting, if required, shall be performed in the field by others.

2. Prior to painting all steel shall be cleaned of loose rust, loose mill scale, dirt and other foreign material. Unless otherwise specified, the fabricator shall not sand blast, flame clean or pickle prior to painting.

B. Primary Frames

1. Clean all steel per SSPC-SP2.
2. Apply one coat of water reducible alkyd primer by spray or dip method to a minimum coating thickness of 1.0 mil.

C. Secondary Structurals

1. Clean all steel per SSPC-SP8 or SSPC-SP6.
2. Apply one coat of coil applied polyester primer to a minimum coating thickness of 0.5 mil. (purlins and girts).

PART 3 – EXECUTION

3.01 INSTALLATION

Installation shall be in accordance with the prefabricated metal building manufacturer's recommendations.

3.02 TECHNICAL ASSISTANCE

The Contractor shall furnish the services of a manufacturer's factory representative to supervise and provide technical direction in the erection and installation of the various building components.

3.03 STORAGE AND HANDLING

Materials shall be delivered to the site in a dry and undamaged condition and stored out of contact with the ground. Material other than framing and structural members shall be covered with weatherproof covering and kept dry. Storage accommodations for roof and wall covings shall provide good air circulation and protection from surface staining.

- END OF SECTION -

DIVISION 15

MECHANICAL

SECTION 15000

BASIC MECHANICAL REQUIREMENTS

PART 1 – GENERAL BASIS OF DESIGN

The HVAC and Plumbing systems shall meet all applicable local, state, and federal building codes. The Contractor shall provide all equipment and specialties complete with trim required and connect in a manner conforming to the Kentucky Building Code. The design criteria shall be as described below:

A. Outside design winter temperature: -4F
B. Outside design summer temperature: 91F
C. Winter design inside temperature: 72F
D. Summer design inside temperature: 78F

Office area shall be provided with electric heating/cooling air handling system. The proposed air handling unit will be located in garage area as shown on the plans. The outside units shall be located as shown on the plans.

The garage bay area shall be provided with gas heat from a bottled gas storage unit. Four (4) 80,000 BTU units are required and shall be installed on separate circuits. The bottled gas unit shall be provided by the owner.

A fifty gallon electric water heater shall be provided for all lavatory sinks, and shower. An emergency eyewash unit will be provided for in the garage area. Emergency eye wash system shall be equipped with tempered water per applicable code. designed in accordance with ANSI Z358.1, including the requirement for tempered water and shall be piped to the floor drain. The tempered water system includes an automatic tempering valve, temperature indicators, and the eyewash fixture.

Backflow prevention shall be provided for the potable water and drainage shall be drained out through exterior wall.

Compressed air and vacuum service is not proposed, nor are interior fire protection measures.

Potable water service is proposed. Metering will be provided by the owner.

A 6" PVC drain line shall tie in with all floor drains in garage area and exit the building and extend to a new 1000 gallon septic tank with leach field system as shown on plans. A grit trap and oil/water separator shall be provided as part of the floor drains for the garage area.

The existing water service shall be relocated to the existing facility as required to construct the new office building. Service to the new building shall tie into the existing line and capped accordingly .

A water meter testing bench is required as shown on the plans in the office area of the garage.

Water closets shall be low consumption flush tank type, 1.1 gallon per flush, pressure assisted, elongated bowl with open front seats. Urinal shall be wall mounted with ¾" flush valve, 1.0 gallon per flush.

Kitchen sink shall be stainless steel with two compartments.

1.01 WORK INCLUDED

A. The work in this section shall include all labor, materials, equipment and services required to construct and install the complete and operable mechanical systems. The omission of express reference to a complete installation shall not be construed as releasing the Contractor from providing such parts or work as may be required.

B. Mechanical systems specified herein include:

Section 15000 - Basic Mechanical Requirements
Section 15140 - Supports and Anchors
Section 15400 - Plumbing System
Section 15510 - HVAC Terminal Units
Section 15831 - Heaters
Section 15860 - Fans
Section 15890 - Ductwork
Section 15910 - Ductwork Accessories
Section 15936 - Terminal Devices
Section 15990 - Testing, Adjusting and Balancing

1.02 REFERENCES

The chemical and physical properties of all materials and the design, performance characteristics and methods of construction of all items of equipment shall be in accordance with the requirements of the latest issue of the various applicable Standard Specifications. These Standard Specifications have been prepared by authorities which are recognized by the Mechanical Trades. The names of these authorities are listed below together with the abbreviation of their names as they may appear in these Specifications.

A. American National Standards Institute (ANSI)

B. American Society for Testing and Materials (ASTM)

C. National Fire Protection Association (NFPA)

D. Air Movement and Control Association (AMCA)

E. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)

F. American Society of Mechanical Engineers (ASME)

G. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA)

1.03 PERMITS AND INSPECTIONS

A. Contractor shall obtain all mechanical, HVAC, plumbing permits and inspections necessary for completion of work under this division and pay all legally authorized fees.

B. Contractor shall furnish three copies of all required inspection certificates before requesting final payment.

1.04 CODE COMPLIANCE AND QUALIFICATIONS

A. Contractor shall complete all work in accordance with applicable State and Local regulations including but not limited to the following:

City, State and County Building Inspector
National and Local Electrical Codes
National Fire Protection Association

State Department of Health
State Plumbing Code
Air Pollution Board
Local Insuring Agency
National Sanitation Foundation
Boiler Inspectors
International Mechanical Code

B. Systems, equipment and materials furnished or provided by this Contractor shall be in accordance with applicable State and Local regulations.

C. Systems, equipment or materials furnished or provided by this Contractor shall not be considered substantially complete if work is not in accordance with applicable State and Local regulations.

D. The Contractor shall be a licensed HVAC Mechanical Contractor in the Commonwealth of Kentucky.

1.05 EXAMINATION OF SITE

A. Contractor shall visit the site and acquaint himself with the working conditions prior to bidding. Contractor shall accept conditions as they exist on bid date. Claims for labor and material required for difficulties encountered, which could have been foreseen had an examination been made, will not be recognized.

B. Contractor shall notify the Architect/Engineer immediately of any existing field conditions not compensated for in the Contract Drawings and/or Specifications. Any work not shown on Contract Drawings which is performed without proper authorization shall make Contractor responsible for correction, addition, and/or deletion as may be later called for by the Architect/Engineer.

1.06 SUBMITTALS

A. Generally shop drawing submittals will be required for all plumbing fixtures and mechanical equipment as specified in the following specification sections.

B. All shop drawings shall be checked and noted accordingly by the Contractor before submitting to the Architect/Engineer for review.

C. No equipment shall be ordered or fabricated without formal approval of submitted shop drawings.

PART 2 - PRODUCTS

2.01 GENERAL

A. Products shall be as specified in Division 15 and in the following sections of these Specifications for specific mechanical products used in the Work.

B. Products containing asbestos shall NOT be used.

C. The Mechanical Contractor shall furnish and install the following equipment related to the HVAC equipment and control systems:

1. All starters and disconnects shall be provided and installed by the Electrical Contractor unless specifically provided with the equipment.

2. All power wiring and conduit shall be provided and installed by the Electrical Contractor.

3. All control wiring and conduit shall be provided and installed by the Control Contractor, unless otherwise noted, and be in accordance with the requirements of Division 16.

D. All electrical equipment, conduit and wire shall meet the requirements of Division 16.

E. Equipment feeder short circuit and overcurrent protection shall be coordinated with the Electrical Contractor and be based on the actual equipment being furnished which may differ from that indicated on the plans.

PART 3 - EXECUTION

3.01 CONSTRUCTION SAFETY

This Contractor assumes responsibility for the safety of his personnel. The Contract Documents do not include materials, procedures, components, etc., required to insure construction safety. Refer to the General Conditions and Supplementary General Conditions for additional information.

3.02 ASBESTOS

A. This Contractor shall instruct all personnel, including those of any sub-contractors, that should any material suspected of containing asbestos be observed that all work shall stop immediately and all personnel shall vacate the premises. This Contractor shall then notify the Architect/Engineer and await further instructions. This Contractor assumes all liability for failure to notify personnel of potential hazards and procedures.

B. Removal of materials containing asbestos is not in this contract.

3.03 CONTRACT DRAWINGS

A. Scale of drawings is approximate. Exact locations, dimensions, and elevations shall be governed by field conditions. Make field measurements of building before fabricating equipment or materials.

B. Drawings are based on physical dimensions of one or more manufacturer's equipment. Other approved equipment shall be of such dimensions that it can be readily installed in available space with ample clearance for proper maintenance and operation.

C. Intent of drawings is to show systems and sizes. Drawings do not necessarily show all required offsets. Work shall be installed to conform with space limitations. Offset, transformation, fittings, etc. shall be provided where required to attain this objective.

D. Refer to other drawings for construction of building, work in other sections and floor and ceiling elevations.

E. Failure to notify the Architect/Engineer of any inconsistencies in the Contract Documents shall make the Contractor subject to either method as may be later called for by the Architect/Engineer.

3.04 ORDER OF WORK

Contractor shall organize work to cause least disturbance possible to operation of any building, service or system on site. When necessary to interrupt services, time of interruption shall be approved by Owner. Extras for differences between regular and overtime pay shall be allowed only when work is authorized to be accomplished at a time other than regular working hours. Work shall be scheduled to coincide with and cause the least possible disturbances to other contractor's work and schedules.

3.05 COOPERATION

A. Cooperate with other trades to obtain the most practical arrangement of work. Become familiar with drawings before starting work.

B. Make known to other trades intended positioning of materials and intended order of work. Coordinate work with other trades and proceed with the installation to assure no delays to other trades. Determine intended positions of work of other trades and intended order of installation.

3.06 WORKMANSHIP

Work shall be performed only by mechanics and tradesmen skilled and working within their respective trades and shall present appearance typical of the best trade practices. Work not installed in this manner shall be repaired, removed or replaced, or otherwise remedied at Contractor's expense as directed by Architect/Engineer.

3.07 GUARANTEE

A. Labor and materials entering into this contract shall be guaranteed for a period of one year from date of acceptance. Date of acceptance shall be date of voucher for final payment. Owner reserves right to use equipment installed prior to date of final acceptance. Use of equipment by Owner shall in no way invalidate guarantee except Owner shall be liable for damage to equipment during this period due to negligence of his operator or other employees.

B. This guarantee shall further provide that in the event of a failure of any system or its component equipment items or the improper functioning thereof, during the period of this guarantee. This Contractor shall have available an "on call" competent service personnel for the restoration of all systems and equipment for complete operation. Should the nature of the failure be such as to present an emergency in the opinion of the Owner, such personnel shall be promptly available, regardless of the hour of the day or day of the week. Should the failure be such as to fall under the guarantee, the cost of the service shall be borne by this Contractor, otherwise the Owner will pay therefor at the prevailing rate for such service.

C. Should this Contractor fail to make such service personnel promptly available "on call" the Owner may employ such personnel as are available to him at the expense of this Contractor.

3.08 MANUFACTURER'S INSTALLATION INSTRUCTIONS

All equipment shall be installed in strict accordance with the manufacturer's installation instructions.

3.09 PROTECTION OF EQUIPMENT AND MATERIALS

This Contractor shall continuously maintain adequate protection of all equipment and materials. Equipment and materials, located inside or outside, shall be tightly covered with sheet polyethylene or waterproof tarpaulin as protection against dirt, rust, moisture and abuse from other trades. Equipment and materials shall not be stored directly on the ground. Equipment, ductwork and piping shall not be used as supports for scaffolds or personnel. Repairs made necessary by damage shall be paid for by this Contractor.

3.10 CUTTING AND PATCHING

A. Unless otherwise indicated do all cutting and patching required for installation of work. All openings not requiring lintels shall be cut and patched by mechanical contractor. Openings requiring lintels for ductwork, grilles, louvers, etc. in vertical walls both new and existing shall be provided by this Contractor. Patching of these openings shall be by this Contractor.

B. Do no more cutting than necessary. Cutting of structural members or exposed surface of concrete block shall not be permitted without written approval of Architect/Engineer.

C. Cut pipe openings in floor slabs with core drill. Scribe cut edges of trenches or openings in slabs with masonry saws.

D. Where necessary to remove exterior walks, paving, or lawns, they shall be returned to their original surfaces.

E. Only skilled mechanics and tradesmen shall do patching and finishing required to match surrounding surfaces.

3.11 PAINTING

A. All painting except "touch-up" shall be provided under the painting section (Division 9) unless noted otherwise. All exposed piping, equipment, etc., shall be left clean and free from rust or grease and ready for the painter.

B. Where equipment finishes are damaged, this Contractor shall obtain touch-up paint in matching colors from the equipment manufacturer and paint as required.

3.12 PIPING AND EQUIPMENT IDENTIFICATION

All piping and equipment shall be labeled, tagged and/or stenciled in compliance with the manufacturer's installation instructions. Refer to specification section 10440.

3.13 TRENCHING AND BACKFILLING

A. This Contractor shall perform all trenching, excavation, shoring, pumping and backfilling required in the installation of the work. All trenches shall be maintained dry until piping tests (see paragraph TESTS) have been approved by the Architect/Engineer. Trenches shall be backfilled in tamped 6" layers immediately after approval of tests. Stability of backfilled soil shall match adjacent undisturbed soil.

B. All exterior buried piping shall be laid with a minimum 30" cover.

C. This Contractor shall exercise all possible care to avoid damage to trees and roots in excavation and trenching. Where possible, the Contractor shall work beyond the drip line of trees. If it is necessary to cut roots 1" to 2-1/2" in diameter, the Contractor shall excavate around, saw cut and paint severed ends of roots with a tree wound sealer. Do not cut roots 2-1/2" and larger.

3.14 CONCRETE PADS AND CURBS

A. This Contractor shall provide all forms, reinforcing and concrete for concrete pads and curbs for mechanical equipment unless noted otherwise. Sizes of all concrete pads and curbs shall be determined from approved submittal information, manufacturer's certified data sheets or field measurements and shall allow for a 6" margin on all sides of equipment.

B. All work shall be performed in accordance with Division 3 -CONCRETE.

3.15 LUBRICATION

This Contractor shall provide all lubricants for the operation of all equipment until acceptance. The Contractor shall protect all bearings during installation of equipment and shall thoroughly grease steel shafts to prevent corrosion. All motors and other equipment shall be provided with covers as required for proper protection during construction. All equipment bearings requiring frequent or periodic lubrication shall be provided with proper fittings for this purpose. Where equipment requiring such lubrication is not readily accessible due to position or location, extensions shall be provided in addition to lubrication fittings.

3.16 EQUIPMENT CONNECTIONS

A. This Contractor shall bring all required mechanical services to all equipment furnished under other sections of this Specification or by the Owner, make final connection, and leave equipment ready for operation.

B. When the Contractor is uncertain about the method of installation, proper location, etc., he shall ask for further instructions or details. Failure to request such information will not excuse non-compliance.

3.17 TESTS

This Contractor shall conduct all specified tests until approved by the Architect/Engineer. All tests shall be repeated until approved by the Architect/Engineer. Piping systems shall not be covered or otherwise concealed until tests have been made and approvals obtained. This Contractor shall notify the Architect/Engineer four days prior to testing to allow for scheduling. Tests shall be conducted as specified in applicable sections.

3.18 CLEAN-UP

A. Before final acceptance of work, clean and restore all road surfaces, sidewalks, and other areas leaving them in a neat, clean and usable condition as originally found. Remove all machinery, tools, surplus materials, dirt, sand, temporary building, and other structures from the site. All manholes and other appurtenant structures shall be cleared of all scaffolding, rubbish and dirt. Existing road and walks cut or damaged shall be restored and repaired to the satisfaction of the Architect/Engineer.

B. Equipment, fixtures, diffusers, grilles and exposed piping and supports shall be cleaned to the satisfaction of the Architect/Engineer before the project can be considered Substantially Complete.

3.19 AS-BUILT DRAWINGS

The Contractor will furnish one (1) set of prints which will be on file in the field office. These prints shall be kept and maintained in good condition at the site of the project and a qualified representative of the Contractor shall record on these prints from day to day as the work progresses, all changes, alterations and deviations from the contract drawings with special emphasis on the exact final location of all underground utilities by offset distances to surface improvements such as building corners, curbs, etc. Entries and notations shall be neat, legible and permanent. Those prints shall be delivered to the Architect/Engineer upon completion of the project. Approval of final payment will be contingent upon compliance with these provisions.

3.20 ACCESS

A. Wherever any mechanical device, or items of equipment is concealed, or enclosed above or behind walls, ceiling, floors, bulkheads, etc. an access panel or door shall be provided, if the device or item will conceivably require service in the future.

B. Access shall be provided for all concealed valves, cocks, cleanouts, expansion joints, air vents, strainers, traps, unions, dampers, splitters, extractors, etc.

3.21 OPERATING AND MAINTENANCE MANUALS

Provide (4) four copies of operating and maintenance manuals. Manuals shall be bound in large ring loose-leaf binders and contain the following:

A. Manufacturer's instructions and/or installation manual.

B. Manufacturer's service manual.

C. Manufacturer's lubrication chart listing types of lubricant to be used on each item of equipment and recommended frequency of lubrication.

D. Electrical diagrams of each equipment "packaged" control system.

E. Part lists and identifying part numbers with prices of each part. The name and address of the nearest distributor from which parts can be obtained.

3.22 OPERATING INSTRUCTIONS

A. Contractor shall organize and conduct a training session at the site. Provide minimum 2 hours to instruct the Owner in the proper operation of all systems.

B. The Owner's operating personnel shall be instructed by the Contractor on how to start and operate each item of equipment. Safety features shall be pointed out, particularly the possible troubles which might cause the safety controls to operate and what might be done to remedy the trouble.

C. The Owner's operating personnel shall be thoroughly instructed in the operation of the control system. Instructions should include an explanation of the control system or system sequence of operation, the proper set points of each thermostat, etc., and how to change the settings to accommodate overheating and overcooling. Instructions shall include an explanation of components which should not be tampered with or control settings which should not be changed. Thermostat keys shall be turned over to the Owner.

D. Relative to the HVAC system, instruct the Owner's operating personnel in the following:

1. Removal of service access panels from equipment. If special tools are required, turn over to Owner at least one set.

2. Method of removing air filters.

3. Method of cleaning permanent-type air filters.

4. Method of cleaning condensate drain piping.

5. Location of concealed valves, traps, air splitters, automatic valves and dampers, etc., requiring periodic maintenance and location of access to them.

3.23 PROJECT CLOSEOUT WORK

A. The following is a list of work required prior to Substantial Completion. The list shall be used as a checklist of items required for closeout. The list shall not be considered as comprehensive and final. The Contractor shall furnish:

1. Operating Instructions.

2. All Warranties.

3. Test and Balance Report.

4. Inspection/Performance Certificates.

5. Red Lined "As-Built Drawings".

B. Responsibility for the operation and maintenance of the work cannot transfer to the Owner until all items listed above have been duly executed and transmitted to the Architect/Engineer.

C. This Contractor shall conduct operating tests of each system and each piece of equipment in the presence of the Owner's Representative and the Architect/Engineer as directed by the Architect/Engineer.

- END OF SECTION -

SECTION 15140

SUPPORTS AND ANCHORS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Pipe, duct, and equipment hangers, supports, and associated anchors.

B. Equipment bases and supports.

C. Sleeves and seals.

D. Flashing and sealing equipment and pipe stacks.

1.02 WORK FURNISHED BUT INSTALLED UNDER OTHER SECTIONS

Furnish hanger and support inserts sleeves to Section for placement into formwork.

1.03 SUBMITTALS

A. Submit shop drawings and product data for all items listed under this section.

B. Indicate hanger and support framing and attachment methods.

PART 2 - PRODUCTS

2.01 PIPE HANGERS AND SUPPORTS

A. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch: Malleable iron, carbon steel, adjustable swivel, split ring.

B. Hangers for Pipe Sizes 2 to 4 inches: Carbon steel, adjustable, clevis.

C. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods; cast iron roll and stand for hot pipe sizes 6 inches and over.

D. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.

E. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp; adjustable steel yoke and cast iron roll for hot pipe sizes 6 inches and over.

F. Vertical Support: Steel riser clamp.

G. Floor Support for Pipe Sizes to 4 Inches and All Cold Pipe Sizes: Cast iron adjustable pipe saddle, locknut nipple, floor flange, and concrete pier or steel support.

H. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

I. Shield for Insulated Piping 2 Inches and Smaller: 18 gage galvanized steel shield over insulation in 180 degree segments, minimum 12 inches long per pipe support.

J. Shield for Insulated Piping 2-1/2 Inches and Larger (Except Cold Water Piping): Pipe covering protective saddles.

K. Shields for Insulated Cold Water Piping 2-1/2 Inches and Larger: Hard block non-conducting saddles in 90 degree segments, 12 inch minimum length, block thickness same as insulation thickness.

L. Shields for Vertical Copper Pipe Risers: Sheet lead.

2.02 HANGER RODS

Steel Hanger Rods: Threaded both ends, threaded one end, or continuous threaded.

2.03 FLASHING

A. Metal Flashing: galvanized steel.

B. Lead Flashing: 5 lb/sq ft sheet lead for waterproofing; one lb/sq ft sheet lead for soundproofing.

C. Flexible Flashing: 47 mil thick sheet butyl; compatible with roofing.

D. Caps: Steel, 22 gage minimum; 16 gage at fire resistant elements.

2.04 SLEEVES

A. Sleeves for Pipes Through Non-fire Rated Floors: Form with 18 gage galvanized steel; plastic inserts or Schedule 40 steel.

B. Sleeves for Pipes Through Non-fire Rated Walls, Footings, and Potentially Wet Floors: Form with steel pipe or 18 gage galvanized steel.

C. Sleeves through beams shall be Schedule 40 steel; only in locations approved by the Structural Engineer.

D. Sleeves for Pipes Through Fire Rated and Fire Resistive Floors and Walls, and Fireproofing: Prefabricated fire rated sleeves including seals, UL listed.

E. Sleeves for Round Ductwork: Form with galvanized steel.

F. Flanges shall be 20 gage galvanized steel.

G. Fire Stopping Insulation: Glass fiber type, non-combustible.

H. Caulk: Fire Barrier CP 25, as manufactured by Minnesota Mining and Manufacturing Co. or equal. Caulk shall be U.L. listed for fire stopping service.

I. Fire stopping for plastic pipe: Sealants, pipe collars, and wrap strips, Rectorseal, Metacaulk or equal. Caulk shall be U.L. listed for fire stopping service.

2.05 FABRICATION

A. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

B. Design hangers without disengagement of supported pipe.

2.06 FINISH

Prime coat steel hangers and supports.

PART 3 - EXECUTION

3.01 PIPE HANGERS AND SUPPORTS

A. Support horizontal piping as follows:

PIPE SIZE	MAX. HANGER SPACING	HANGER DIAMETER
1/2 to 1-1/4 inch	6'-0"	3/8"
1-1/2 to 2 inch	10'-0"	3/8"
2-1/2 to 3 inch	10'-0"	1/2"
4 to 6 inch	10'-0"	5/8"
PVC (All Sizes)	4'-0"	3/8"
C.I. Bell and Spigot (or No-Hub)	5'-0" and at joints	5/8"

B. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.

C. Place a hanger within 12 inches of each horizontal elbow.

D. Use hangers with 1-1/2 inch minimum vertical adjustment.

E. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.

F. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.

G. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

H. Support riser piping independently of connected horizontal piping.

3.02 EQUIPMENT BASES AND SUPPORTS

A. Provide equipment bases of concrete type.

B. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.

C. Construct support of steel members. Brace and fasten with flanges bolted to structure.

D. Provide rigid anchors for pipes after vibration isolation components are installed.

3.03 FLASHING

A. Provide flexible flashing and metal counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.

B. Flash vent and soil pipes projecting 12 inches minimum above finished roof surface with lead worked one inch minimum into hub, 8 inches minimum clear on sides with 24 x 24 inches sheet size. For pipes through outside walls, turn flanges back into wall and caulk, metal counterflash and seal.

C. Flash floor drains in floors with topping over finished areas with lead, 10 inches clear on sides with minimum 36 x 36 inch sheet size. Fasten flashing to drain clamp device.

D. Seal floor, and mop sink drains watertight to adjacent materials.

E. Provide acoustical lead flashing around ducts and pipes penetrating equipment rooms, installed in accordance with manufacturer's instructions for sound control.

3.04 SLEEVES

A. Extend sleeves through floors one inch above finished floor level. Caulk sleeves full depth and provide floor plate.

B. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with fire stopping insulation and caulk seal. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

C. Install chrome plated steel escutcheons at finished surfaces.

- END OF SECTION -

SECTION 15400

PLUMBING SYSTEM

PART 1 - GENERAL

1.01 WORK INCLUDED

The following described work, materials and equipment shall be furnished and installed as shown on the Drawings and as herein specified.

A. All plumbing fixtures, accessories and trims as shown on the Drawings and as herein specified.

B. Domestic water service, specialties and piping to all fixtures and equipment.

C. All sanitary sewer piping and equipment shown throughout the building and extension of the sanitary sewer to the manhole.

D. Natural gas service, specialties and piping to all equipment.

1.02 REFERENCES

All plumbing installation and fabrication shall be in accordance with applicable State and Local Plumbing Codes.

1.03 SUBMITTALS

Submit catalog data and shop drawings for all materials and equipment listed under this section.

PART 2 - PRODUCTS

2.01 PLUMBING FIXTURES

A. General: Provide all plumbing fixtures complete with trim required, and connect in a manner conforming to the state and local plumbing codes. Certain fixtures will be furnished by others under other sections of these Specifications. Provide rough-in and final connections including all valves, traps, specialties, etc. required.

B. Provide traps for all waste connections where not furnished with the equipment and stop cocks or valved shut-offs for all water connections to all sinks and other items of equipment. All exposed pipe and metal, including that within cabinets, shall be chrome plated.

C. Quality and Type of Fixtures: Plumbing fixtures, trim, carriers and accessories are specified by catalog numbers. The purpose is to establish quality and type. Fixtures of equal quality and type may be submitted for approval.

2.02 FIXTURE SCHEDULE

A. P-1 - Double Compartment Laundry Sink:

1. Floor set with legs
2. *White molded fiberglass, 45" x 22", double compartment laundry sink with faucet* deck, back and wall bracket.

3. Fiat No. FLTD, or equal.
4. Order sink without pre-drilled faucet holes. Field drill faucet deck to allow trim to be installed for each bowl as listed below. Provide verification that there is adequate space to mount the specified trim on the sink deck.

Trim for Right Hand Bowl:
1. Chrome plated brass faucet with 8" swing spout and standard aerator, Fiat No. A-1, or equal.
2. Grid drain and tailpiece.
3. Chrome plated angle stops and supply risers.

Trim for Left Hand Bowl:
1. Gooseneck Faucets for water samples: four (4) T&S brass No. BL-5707A, or equal, with vacuum breaker and serrated nozzle tips.
2. Grid drain and tailpiece.
3. P-trap with cleanout.
4. Chrome plated angle stops and supply risers.

B. ESEW - Combination Emergency Shower and Eyewash:

1. All schedule 80 PVC construction.
2. 1" stay-open ball valve for shower. Operated by stainless steel pull rod with triangular handle.
3. 10" diameter impact resistant plastic shower head and eye wash bowl.
4. ½" stay-open ball valve for eye wash. Operated by push handle.
5. Bradley Model No. S19-310 PVC.

2.03 ELECTRIC WATER HEATERS

Furnish and install an AGA certified, ASHRAE 90A-1980, commercial condensing water heater with automatic safety control, intermittent electronic ignition, 100 percent safety shut-off valve, factory set high limit, glass-lined tank, 150 psi maximum hydrostatic working pressure, ASME rated pressure and temperature relief valve, magnesium anode rods, tank drain valve, 5 year warranty. A. O. Smith Cyclone, or equal.

2.04 DOMESTIC WATER PIPING SYSTEM

A. Buried, Exterior - Copper Pipe: Type K hard drawn copper per ASTM B-88. Fittings: Wrought copper or cast brass. Joints: Lead free, tin-silver solder.

B. Buried, Below Slab (to 5' outside of building):

1. Copper Pipe, 2" and smaller: Type K soft drawn copper per ASTM B-88.

2. Copper Pipe, 2-1/2" and larger: Type K hard drawn copper per ASTM B-88. Fittings: Wrought copper or cast brass. Joints: Lead-free, tin-silver solder. All joints below slab shall be tinned prior to joining. Changes in direction shall be best by approved tubing bending tools designed expressly for this purpose.

C. Above Grade - PVC Cold Water Piping and Fittings: Schedule 40 per ASTM-D-1785. Fittings: PVC per ASTM D-2665. Joints: Solvent weld per ASTM D-2855 with solvent per ASTM D-2564.

D. Above Grade - CPVC Hot Water Piping and Fittings: Schedule 40 per ASTM-1784, solvent weld per ASTM-D-2564.

2.05 DOMESTIC WATER SPECIALTIES

A. Water Hammer Arrestors: ANSI A112.26.1; sized in accordance with PDI WH-201, precharged suitable for operation in temperature range -100 to 300 degrees F and maximum 250 psig working pressure; Model Z-1700 manufactured by Zurn; Josam, Wade or equal.

B. Wall Hydrants: ANSI/ASSE 1019; non-freeze, self-draining type, hose thread spout with Integral vacuum breaker-backflow preventor, loose key; Woodford Model 65 or equal by Chicago Faucet or Zurn.

C. Wash Down Hoses: 15-foot and 50-foot lengths of 3/4-inch heavy duty commercial rubber reinforced hose rated for 150 psi. Gates or equal. Hoses shall have standard 3/4-inch hose thread.

D. Spray Heads: Hand-held, heavy-duty, hand-operated spray heads suitable for floor washdown. Connection shall be standard 3/4-inch hose thread. All chrome plated brass construction.

E. Hose Racks: Heavy duty, galvanized steel, wall-mounted hose racks, each capable of storing 100 feet of 3/4-inch hose. Coordinated mounting locations with the Owner.

F. Hose Bibbs: ASSE approved vacuum breaker-backflow preventer, chrome plated cast brass, 3/4" hose thread nozzle, close coupled, loose key; Woodford Model 24P or equal by Chicago Faucet or Zurn.

G. Reduce Pressure Backflow Preventers: ANSI/ASSE 1013; FCCCHR of USC; bronze or epoxy coated cast iron valve body with bronze and plastic internal parts and stainless steel springs; two independently operating, spring loaded check valves; diaphragm type differential pressure relief valve located between check valves; third check valve which opens under back pressure in case of diaphragm failure; non-threaded vent outlet; assembled with two full ported ball valves, strainer, and all test cocks; Watts Regulator, Series 909SQT or equal.

2.06 SANITARY SEWER PIPING SYSTEM

A. Buried, Exterior:

1. Cast Iron Pipe: ASTM A-74 spun service weight. Fittings: Cast iron. Joints: Hub-and-spigot, CISPI HSN compression type with ASTM C564 neoprene gaskets or lead and oakum.

2. PVC Pipe: SDR-35 Piping and Fittings per ASTM D-3034. Joints and Gaskets: per ASTM D-3212 and ASTM F-477.

B. Buried, Below Slab:

1. Cast Iron Pipe: ASTM A-74 spun service weight. Fittings: Cast iron. Joints: Hub-and-spigot, CISPI HSN compression type with ASTM C-564 neoprene gaskets or lead and oakum.

2. PVC Pipe: Schedule 40 per ASTM D-1785. Fittings: PVC per ASTM D-2665. Joints: Solvent weld per ASTM D-2855 with solvent per ASTM D-2564.

C. Above Grade:

1. Cast Iron Pipe: ASTM A-74, spun service weight. Fittings: Cast iron. Joints: Hub-and-spigot, CISPI HSN compression type with ASTM C-564 neoprene gaskets or lead and oakum.

2. Cast Iron Pipe: CISPI 301, hubless, spun service weight. Fittings: Cast iron. Joints: Neoprene gaskets and stainless steel clamp-and-shield assemblies.

3. PVC Pipe: Schedule 40 per ASTM D-1785. Fittings: PVC per ASTM D-2665. Joints: Solvent weld per ASTM D-2855 with solvent per ASTM D-2564.

2.07 SANITARY SEWER SPECIALTIES

A. Cleanouts: Provide cleanouts as specified herein, as required to comply with all applicable Codes and/or as indicated on the Drawings. Cleanouts in floors shall be cast iron, push-on type with neoprene gaskets, threaded, adjustable height heads and bronze plugs unless noted otherwise. Cleanouts shall be the same nominal size as the pipe served up to 4" and not less than 4" for line sizes greater than 4". Zurn cleanouts have been specified, however, cleanouts of equal quality as manufactured by Josam, Wade, or J. R. Smith will be acceptable.

1. Cleanouts in unfinished floors shall have round, scoriated, heavy duty, nickel bronze tops; Zurn No. Z-1410-2.

2. Cleanouts in carpeted floors shall have round, heavy duty, nickel bronze tops with carpet retainer; Zurn No. Z-1405-14.

3. Cleanouts in other finished floors shall have round, scoriated, heavy duty, nickel bronze tops; Zurn No. Z-1410-2.

4. Cleanouts in walls for cast iron piping shall be cast iron ferrules with no-hub joints, cadmium plated cast iron counter sunk plugs and round stainless steel access cover with securing screw; Zurn No. Z-1440-1.

5. Cleanouts in walls for PVC piping shall be solvent weld socket threaded, with threaded plug, stainless steel access cover, Zurn No. Z-1440-3.

6. Cleanouts on exposed piping shall be accessible and be provided with straight threaded, tapered shoulder plugs that seal against caulk lead seats; Zurn No. Z-1440.

B. Floor Drains:

1. Provide floor drains at locations indicated and/or as required by Kentucky Building Code. Install in a neat and workmanlike manner. Coordinate locations with appropriate persons or party to insure floor pitch to drain where required.

2. Install floor drains in strict accordance with manufacturer's recommendations and the KBC unless otherwise indicated.

3. Each floor drain located on floors above the lowest floor shall be provided complete with a three (3) foot by three (3) foot, four (4) pound sheet lead flashing and clamping collar or chlorinated polyethylene shower pan liner of 30 mil. Lead pans shall be given a heavy coat of asphaltum on bottom and sides before installation and a heavy coat on exposed surfaces (if any). After installation, provide one ply of fifteen (15) pound roofing felt beneath each pan.

4. Insure by coordination with the appropriate persons or party that spaces served by a floor drain(s) has a water seal extending at least three (3) inches from the floor of the space served on all floors above the lowest level.

5. Trench drain system in the garage and wash bay area shall be Zurn, Z-812 12" wide pre-sloped trench drainage system or engineer approved equal. Glass filled polyester fiberglass drain channel with 1.04 percent (1/8" per foot) bottom slope. All sections modular 10 foot lengths with interlocking ends. Complete with extra heavy-duty Dura-coated steel frame assembly, combination anchor tabs/leveling devices at appropriate locations and extra heavy-duty cast iron gate. Provide with dome bottom strainer. Trench drains shall be provided in combined lengths of 10', 20' and 30' as shown on the floor plan, with a minimum depth of 6.25" and a maximum depth of 10". Trench drain system shall include a grit trap and oil/water reservoir for separating the oil/grease and water prior to discharging to the septic system (Zurn Z-885 triple basin design, 300 gallon capacity or approved equal.) The grit trap and oil/water separator shall have a heavy duty frame and cover suitable for traffic loading.

6. The floor drains shall be Zurn, Josam, Watts,Jay R. Smith, Ancon or equivalent. Refer to the Plumbing Plans for Floor Drain Selections.

C. Trap Primers:

Provide trap primers for all floor drains and open receptacle.

1. Trap Primer Type-1 -- Zurn Z-1022, trap primer shall be installed in cold water supply line of nearest plumbing fixture. One trap primer per floor drain, one trap primer per fixture. Pipe to waste inlet per manufacturer's recommendations.

2. Trap Primer Type-2 -- Precision plumbing products trap primer shall be installed on a cold water line, with distribution unit(s) to serve 1 to 8 drains. Install per manufacturer's recommendations.

2.08 NATURAL GAS PIPING SYSTEM

A. Above Grade - Steel pipe: ASTM A53, Schedule 40 black. Fittings: ANSI/ASME B16.3, malleable iron, or ASTM A234, forged steel welding type. Joints: Screwed for pipe 2" and under; ANSI/AWS D1.1, welded, for pipe over 2".

B. Below Grade:

1. Steel Pipe: Schedule 40, black, per ANSI B36.10. Piping shall be factory coated with a yellow plastic equal to Lone Star "X-THRU". Fittings: Malleable iron per ANSI/ASME B16.3 or forged steel welding type per ASTM A 234. Joints: Screwed per ANSI B2.1 for pipe sizes 2 inch and under; Welded per ANSI/AWS D1.1 for pipe sizes 2-1/2 inch and over. Fittings and joints shall be covered with multiple layers of black plastic tape to provide protection equal to factory applied coatings. Tape shall be Kendall Company "Polyken #900" or equal by Tapecoat, 3M or Steelcoat.

2. Polyethylene (PE) Pipe: PE 2306/2406 per ASTM D-2513; Phillips-Drisco 6500 or equal. Fittings: PE plastic per ASTM D-3261; Central Plastics or equal. Joints: Heat-fusion using clamps and jigs per qualified procedures.

C. Accessories for PE Gas Line Installation:

1. Valves: Valves for interior distribution piping shall be installed at the locations illustrated on the Drawings. All valve sizes shall be equal to that of the pipe.

2. Pressure Regulators: This Contractor shall provide pressure regulators as shown on the Drawings. Regulators shall have an internal pressure relief device.

3. Anodeless Risers: Anodeless risers shall be located as shown on Drawings. Risers shall have a transition fitting for connection to PE pipe. If anodeless riser is not available in the requested size, a standard service riser shall be provided with a 17 lb anode connected by a 'cad-weld' process. Central Plastics or equal.

4. Transition Fittings: Steel to polyethylene transition fittings shall be provided where pipe material changes from steel to PE. Transition fittings shall be the same size as the pipe being transitioned. The PE portion of the fittings shall be of equal or greater quality as the pipe to which it will be fused. Transition fittings shall be manufactured by Central Plastics or equal.

D. Location Systems

1. The Contractor shall install a system of electrically conductive wires in such a manner that direct-burial PE mains and services can be located with an electronic pipe locator. This system of wires shall be installed so that a continuous electrical circuit is provided which will allow a pipe locator to the wire system.

2. A single-conductor solid copper wire, AWG12UF, with 600 volt THW white vinyl insulation shall be installed in the trench with the PE pipe and shall be placed approximately 3" above the top of the pipe. The locator wire shall not touch or lay against the polyethylene pipe. All PE pipe and services shall have a locating wire. The locating wire shall not be broken at or attached to valves and shall be located so it will not hamper operation of the valves.

3. The locating wire from PE services shall be connected to the main locating wire and the connection shall be insulated and water proofed. All splices, and connections shall be made with a Kearney bolt, a Scotch Lok 562 connector, and AMP Solderless Connector, or approved equal. Twisting of wires will not be permitted. All splices and connections shall be insulated and water proofed with two layers, each with 50% overlap, of plastic electrical tape, Scotch No. 33, or approved equal. The end of the wire at the riser shall be taped with plastic electrical tape or attached to the riser subject to approval of the Engineer. A continuity test shall be performed by the Contractor in the presence of the Inspector to demonstrate that all connections have been made and that the circuit is continuous.

4. The Contractor shall also install non-metallic locator tape in the pipe trench approximately 6 inches below the natural ground level and directly over the pipe. The tape shall be 4-mil plastic with minimum width of three inches (3"). The tape shall be yellow in color with the inscription "Caution Gas Line Buried Below". Letters shall be placed above all polyethylene and steel mains constructed under the Contract.

E. Curb Stop: Valve for the main cutoff on PE pipe shall be Rockwell 'Polyvalve' ball valve with full size port. Material shall be PE 2306, SDR 11. Valve shall be installed with a plastic 'off-roadway' valve box, sliding type with non-locking lid. Valve box and valve shall be installed with a valve support system to prevent valve twisting and to provide support.

2.09 CONDENSATE DRAIN PIPING

PVC Pipe: Schedule 40 per ASTM D-1785. Fittings: PVC per ASTM D-2466. Joints: Solvent weld per ASTM D-2855 with solvent per ASTM D-2564.

2.10 P & T RELIEF PIPING

Above Slab - Copper Pipe: Type M hard drawn copper per ASTM B-88. Fittings: Wrought copper or cast brass. Joints: Lead-free, tin-silver solder.

PART 3 - EXECUTION

3.01 GENERAL

A. Obtain exact centerline rough-in dimensions between partitions or walls from the Architectural Drawings. Work shall be roughed-in so that all exposed piping will be straight and true without bends or off-sets. Water supplies shall connect through walls with stops and chrome plated escutcheons with set screws. Where fixtures are without supporting legs or carriers secure wall hangers to bolts welded to 3/16" steel plates, mounted against walls within chases.

B. Where backs of fixtures join wainscotting or tile, they shall be ground flat and the joints made close. Run bead of white caulking compound around back of fixture at outside edge before final setting. When fixture is set, wipe compound so that joint is sealed. Remove excess compound with solvent. Caulking compound shall be Porter "Brilliant White", Pittsburgh Glass, Sherwin-Williams, or equal.

C. All rough-in sanitary sewer piping shall be properly plugged or capped in a manner approved by the Architect.

D. Fixtures and trim shall be mounted in accordance with the latest revisions to the Authorities having jurisdiction.

E. Before final acceptance, the Plumbing Contractor shall furnish a certificate of inspection and final approval from the Plumbing Inspector to the Owner and be in accordance with the latest revisions of the Plumbing Laws, Regulations and Codes and the Approved Plumbing Drawings and Specifications.

3.02 DOMESTIC WATER PIPING SYSTEM

A. Provide a complete system of domestic water piping including interior and exterior work as indicated.

B. All piping shall be installed to allow complete draining. Provide drain valves at all low points where fixtures cannot be used to drain piping.

C. Provide shutoff valves at each branch from main. Provide shutoff valves for each fixture group to minimize interruption of service for maintenance and repair.

D. Piping through slabs on grade shall be protected with 1/2" thick closed cell flexible foam insulation minimum 6 inches above and below slab.

E. Piping through metal studs shall be isolated from metal to metal contact with plastic bushings specifically designed for the application.

F. Provide water hammer arrestors for each fixture group as indicated. Capacity of each water hammer arrestor shall meet or exceed the total fixture units of each fixture group. All water hammer arrestors shall be accessible for inspection and/or replacement, provide access panels as required.

G. All stubouts and exposed piping shall be rigidly supported to eliminate movement.

H. This Contractor shall complete all equipment connections to the domestic water piping system. Provide shutoff valves and unions for each connection.

I. All mixing valves and mixing faucets with hose connections shall have check and shutoff valves in the cold and hot water supply lines.

3.03 SANITARY SEWER PIPING SYSTEM

A. Provide a complete system of sanitary sewer drain, waste and vent piping including interior and exterior work as indicated.

B. Piping 6" and smaller shall be sloped at least 1/8 inch per foot. Piping buried below slab shall be sloped 1/4 inch per foot where possible. Piping 8" and larger shall be sloped at least 1/16 inch per foot.

C. Buried piping shall be laid in minimum 4 inches of bedding and sloped as specified herein. Bedding shall be accurately and uniformly graded. Bedding shall be crushed stone equal to Kentucky Highway Department #9 crushed stone. Bedding shall be free of organic material.

D. Provide cleanouts as required by Code and as indicated on the Drawings. Cleanouts for piping 4" and smaller shall be line size. Cleanouts for piping 6" and larger shall be 4". Provide exterior cleanout within 5 feet of building. Interior cleanouts in floors shall be flush with finished floors. Interior cleanouts in walls shall be above the flood level of plumbing fixtures. Exterior cleanouts in unpaved areas and areas paved with other than concrete shall be set flush in 24" x 24" x 4" concrete pads flush with finished grade.

E. Vents through a roof shall be at least 3 inches in diameter and shall terminate at least 12 inches above the roof.

F. This Contractor shall be responsible for locating vents at least 10 feet from Outside Air intakes, offset vents as required.

G. Drainage piping shall be installed with hubs upstream of each pipe section. Provide reducing fittings where different sizes of pipe are to be connected, bushings shall not be used. Provide longsweep fittings, sanitary tees and combination wyes with 1/8 bends as applicable.

3.04 NATURAL GAS PIPING SYSTEM

A. Provide a complete system of natural gas piping including interior and exterior work as indicated.

B. Test piping with air at 25 psig for four hours and measure with mercury manometer.

C. This Contractor shall make final connections to each piece of equipment furnished by him or by others unless noted otherwise. Provide a shut-off cock, union and dirt leg at each individual equipment connection.

D. Gas piping installed in concealed spaces shall have welded joints and fittings for all sizes.

E. Install piping with a minimum 48" clearance from other buried metallic piping or equipment.

F. Exterior piping above grade shall be primed and painted with two coats of paint. Color shall be similar to nearest structure.

G. Provide a dielectric union at each location where the piping enters the building to electrically isolate the gas distribution system. A DC voltage reading shall be made to test the effectiveness of the isolating unions. A minimum reading of 0.2 volts (measured across the union) shall be required. Repair or replace unions until this voltage can be obtained.

H. Provide 17 pound magnesium anodes for steel piping below grade. Locate as indicated in an augered hole five feet from the pipe. The electrode shall be brazed or thermite welded to the pipe and then coated with mastic.

I. The condition of the pipe coating, the effectiveness of the isolation and other tests shall be approved by the Architect.

3.05 TESTING

A. All piping shall be tested before being insulated or concealed in any manner. Where leaks or defects develop, required corrections shall be made and tests repeated until systems are proven satisfactory.

B. Water piping systems shall be subjected to a hydrostatic test of one hundred fifty pounds. The system shall be proven tight after a twenty-four (24) hour test.

C. All soil, waste and vent piping shall be subjected to a hydrostatic test of not less than a 10-foot head or an air test of not less than 10 pounds per square inch. Piping shall be tested for not less than (15) minutes.

D. After fixtures have been installed, the entire plumbing system, exclusive of the house sewer shall be subjected to an air pressure test equal to one inch water column and proven tight. The Contractor shall furnish and install all of the test tees required, including those for isolating any portion of the system for tests. Test shall be maintained for (15) minutes.

3.06 STERILIZATION

A. Thoroughly flush the domestic water piping then sterilize by the following method or other methods satisfactory to the Architect and the Authority Having Jurisdiction.

B. Fill piping with a solution contain 50 ppm of available chlorine. Open and close all valves to thoroughly distribute solution thru all piping. Allow solution to stand for 24 hours then test for residual chlorine at the ends of the lines. If less than 25 ppm is indicated, repeat the sterilization process. When tests show at least 25 ppm of residual chlorine, flush out the system until all traces of chlorine are removed.

C. The Architect reserves the right to test the water again at any time prior to final acceptance of the work and if found to be unsafe bacteriologically, to require the Contractor to rechlorinate the system until the water is proven equal to that supplied by the public system.

- END OF SECTION -

SECTION 15510

HVAC TERMINAL UNITS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The work of this section consists of providing all labor, materials, and services necessary for the fabrication and installation of all equipment and appurtenances in connection with the heating, ventilating and air conditioning work. This includes the work as shown on the Drawings and as specified herein.

B. Packaged Heating and Cooling Units: Wall-mounted process HVAC units.

1.02 SUBMITTALS

Submit catalog data and shop drawings for all materials and equipment specified under this section.

PART 2 - PRODUCTS

2.01 WALL-MOUNTED PROCESS HVAC UNITS

A. General: Unit shall be wall-mounted type process cooling unit, factory assembled, piped, internally wired and fully charged with R-22. Units shall be ETL listed for outdoor installation. Unit capacity shall be rated in accordance with ARI standard 210.

B. Casing and Frame: The frame shall be of welded construction. The casing shall be constructed of heavy gauge rust-resistant galvanized steel and finished on all exterior surfaces with weather resistant enamel and be complete with mounting brackets, condenser grille protector guard and fresh air damper. Panels shall be insulted with 1-1/2 pound per cubic foot, 1" thick fiberglass insulation. Unit shall have the following:

1. Full length mounting brackets on sides and bottom.
2. Thermal expansion valve control.
3. High/Low pressure switches with lockout relay resettable from wall thermostat.
4. Low pressure timed bypass circuit for low ambient operation.
5. Three (3) speed blower.
6. Stainless steel drain pan.
7. Electric heat.
8. 2", 30% ASHRAE rated filter.
9. Manual adjustable fresh air intake damper.
10. Anodized aluminum adjustable vane supply register and return grille.
11. Unit mounted power disconnect.
12. Wall sleeves.

C. Evaporator and Condenser Coils: The coils shall be of non-ferrous construction with aluminum plate fin mechanically bonded to copper tubes.

D. Compressor: The unit shall contain a hermetic scroll compressor. Compressor shall be complete with access valves, high and low pressure switches. The compressor shall be protected by thermal and electrical overloads and built-in circuit breakers. Provide the following:

1. High efficiency scroll compressors.
2. 4-year extended compressor warranty.
3. Adjustable compressor time delay relay.
4. Access valves for charging.
5. Hinged access doors.
6. Dry contacts for remote alarm on high/low pressure lockout.
7. Hot gas bypass.
8. 105 degree rated condenser coil surface.
9. Low ambient fan modulation to -20 degrees ambient.

E. Fans and Motors: The evaporator fan shall be of the forward curve centrifugal type, tested and rated in accordance with AMCA requirements. Fans shall be direct driven with multi-speed motors. Evaporator blower and motor shall have permanently lubricated bearings. Condenser fan shall be propeller type, direct-driven by a factory-lubricated motor. Condenser air shall be discharged horizontally.

F. Filters: Filters shall be 2" pleated type, installed in the filter section as part of the unit.

G. Room Thermostats: Thermostat for package air conditioning unit shall be low voltage remote wall mounted thermostat NEMA 4X rated.

PART 3 - EXECUTION

3.01 GENERAL

A. All equipment shall be installed in strict compliance with all applicable codes and the recommendations of the manufacturer.

B. Equipment configuration and location shall be as shown on Drawings.

C. Equipment installation shall be such that all connections, filters, motors, bearings, and belts can be easily serviced.

D. Units shall be installed with vibration isolators in such a location that internal parts can be easily removed for cleaning and inspection. Correct excessive noise and vibration from equipment.

E. All filters shall be in place prior to starting units.

F. Provide flexible connections at vibrating equipment.

G. All equipment shall be lubricated before start-up.

3.02 PERFORMANCE TESTS

A. This Contractor shall provide all necessary instruments to perform tests as required.

B. The Heating and Ventilating Contractor shall conduct the following tests upon completion of installation of the system under the direction of the Architect.

1. Air Distribution System: Performance test after proper balancing of system, showing airflow measurements through each supply and return.

2. Ventilation System: Performance test after proper balancing, showing airflow measurements through each exhaust grille.

3.03 SERVICE AND WARRANTY

Contractor shall provide services as required to assure that the heating, ventilating and air conditioning system operates properly for a complete heating season and a complete cooling season to the satisfaction of the Owner. During this period, the Contractor shall periodically check equipment to assure all systems are functioning as designed and specified. Any deviations shall be corrected at no extra charge to the Owner for this service.

3.04 MISCELLANEOUS

Provide two spare filters of each type used with HVAC equipment.

- END OF SECTION -

SECTION 15831

HEATERS

PART 1 - GENERAL

1.01 WORK INCLUDED

The work of this section consists of providing all labor, materials, and services necessary for the fabrication and installation of all equipment and appurtenances in connection with the heating, ventilating and air conditioning work. This includes the work as shown on the Drawings and as specified herein.

A. Electric unit heaters.

B. Gas-fired unit heaters.

C. Electric radiant heaters.

1.02 SUBMITTALS

A. Submit shop drawings, product data and samples for all equipment listed under this section.

B. Show mechanical and electrical requirements.

PART 2 - PRODUCTS

2.01 ELECTRIC UNIT HEATERS

A. Size and locations per Drawings.

B. Heater shall be heavy duty commercial type. Heaters shall be UL listed.

C. Motor: Industrial rated, totally enclosed, permanently lubricated, with thermal overload.

D. Automatic reset thermal cut-out disconnects element and motor if normal temperatures are exceeded.

E. Integral thermostat. Range of 35 to 85 degrees F.

F. Wall or ceiling mounting as shown on the Drawings.

G. Heaters by Indeeco, Markel, or equal.

2.02 ELECTRIC UNIT HEATERS (EXPLOSION-PROOF)

A. Size and locations per the Drawings.

B. UL listed for Class 1, Division 2, Group F, Carbon.

C. Unit heaters shall be forced fan type.

D. Motor: Heavy-duty explosion-proof motor.

E. Universal mounting kit to permit either wall or ceiling mounting as indicated on Drawings.

F. Outlet grille shall have adjustable louvers.

G. Non-sparking aluminum fan and heater case.

H. Built-in overtemperature protection.

I. Factory-mounted and wired explosion-proof thermostat, controls, contactor and disconnect.

J. Heaters by Markel, Indeeco, or equal.

2.03 INFRARED HEATERS

A. Size and locations per Drawings.

B. Infrared heaters shall be the heavy duty type with quartz tube elements. Heaters shall be UL listed.

C. Wall or ceiling mounted as shown on the Drawings.

D. Gold anodized aluminum reflector and end caps.

E. Commercial grade remote thermostat, NEMA 4X rated, double-pole, to be compatible with the heater amperage and voltage, approximate temperature range from 50 to 90 degrees F.

F. Corrosion resistant stainless steel housing and mounting hardware.

G. Horizontal mounting with 90E symmetric heat pattern.

H. Provide an extra set of Quartz tube elements for each heater.

I. Markel Series 670 - stainless steel option, or equal.

2.04 GAS-FIRED UNIT HEATERS (SEPARATED COMBUSTION)

A. Units shall be A.G.A. certified and equipped for natural gas; capacities as rated by A.G.A. for natural gas; and as scheduled on the Drawings.

B. Stainless steel heat exchangers and burners.

C. Separated combustion vent (vertical terminal) type with factory installed power vent fan, and combustion vent kit for vertical vents through roof.

D. Provide with factory installed low-voltage control transformer and single stage gas control system with regulated combination redundant gas valve and intermittent spark pilot with electronic flame supervision.

E. Include all required limit and safety controls, including air pressure differential switch to verify proper vent flow before allowing operation of the gas valve.

F. Propeller fans with open drip-proof motors and integral thermal overload protection.

G. Horizontal louvers for adjustment of discharge air flow unless otherwise noted on the Drawings.

H. Steel cabinet with neutral baked enamel finish.

I. Furnish with factory mounting brackets for ceiling or wall mounting as indicated and/or scheduled on the Drawings.

J. Where indicated and/or scheduled on the Drawings, furnish single stage remote mounted low-voltage adjustable thermostat (40-90 deg. F) and transformer.

K. Vent terminal cap.

L. See Drawings for specific options.

M. Wall mounted thermostat NEMA 4X rated.

N. Manufactured by Reznor, Modine, Trane or equal.

PART 3 - EXECUTION

3.01 INSTALLATION - HEATERS

Installation shall comply with the recommendations of the manufacturer and applicable codes.

3.02 ACCEPTANCE, GUARANTEE AND SERVICE

All components, parts and assemblies shall be guaranteed against defects in workmanship and materials for a period of one year after acceptance.

- END OF SECTION -

SECTION 15860

FANS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Centrifugal inline fans.

B. Wall-mounted propeller fans.

C. Roof mounted centrifugal exhaust fans.

D. Ceiling mounted pendant fans.

1.02 QUALITY ASSURANCE

Conform to AMCA bulletins regarding construction and testing. Fans shall bear AMCA certified rating seal. All fans to be UL Listed.

1.03 SUBMITTALS

A. Submit shop drawings for all equipment listed under this section.

B. Submit with shop drawings, operating point plotted on curves.

C. Submit manufacturers' installation instructions.

PART 2 - PRODUCTS

2.01 FANS - GENERAL

A. Provide and install fans and accessories as scheduled on the drawings and/or specified in this Section.

B. *Brand-named items are for standard of reference and do not necessarily limit supply to* named manufacturer. Items of same physical size, function and performance are acceptable from nationally recognized manufacturers.

C. Fans shall be statically and dynamically balanced by manufacturer to eliminate vibration or noise transmission to occupied areas of the building.

D. Provide adjustable sheaves for all belt-driven fans.

E. Provide belt and fan guards on belt driven fans.

F. Motors shall be permanently lubricated, heavy duty type suitable for space NFPA classification, fan load and furnished at the scheduled voltage, phase and enclosure.

G. Provide safety personnel guards to prevent accidental contact with moving parts.

H. All motors shall meet the requirements of Division 16.

I. Provide flexible duct connections for fans connected to ductwork.

J. Sizes and locations per the Drawings.

K. Provide explosion-proof motors and spark-proof construction for fans in explosion rated areas.

L. Provide vibration isolation mountings for motor and drive, and provide vibration isolation hanger or base kits for suspended and floor mounted fans.

M. Provide weather hoods with bird screen as scheduled on the drawings.

2.02 FAN SELECTION

A. Equivalent fan selections shall not decrease motor horsepower (wattage), increase noise level, increase tip speed by more than 10 percent, or increase inlet air velocity by more than 10 percent, from that specified.

B. Fan performance shall be based on sea level conditions.

2.03 FAN PAINTING AND FINISHES

A. Factory applied prime coated fan wheels and housings inside and outside. Prime coating on aluminum parts is not required unless noted otherwise..

B. Provide aluminum, stainless steel or special coatings on fan airstream parts where indicated on the drawings and specified in this section.

C. Provide protective coatings for fans handling corrosive, chlorine and high moisture atmospheres.

2.04 CENTRIFUGAL INLINE FANS

A. Belt or direct drive, centrifugal type.

B. Heavy gauge galvanized steel housing. Inlet and outlet duct collars. Removable access panels. Provide outlet guard(s) for fans without duct connections.

C. Backward inclined, centrifugal non-overloading fan wheels.

D. Motors shall be explosion proof, heavy duty type with permanently lubricated, sealed ball bearings.

E. Entire drive assembly shall be mounted on vibration isolators.

F. Vertical hanging kit with neoprene isolators.

G. Greenheck Model SQ, BSQ, or equal.

2.05 SIDE WALL PROPELLER FANS - BELT DRIVE

A. Belt-driven, axial type meeting scheduled sound ratings.

B. Propellers shall be constructed of die formed steel blades or aluminum blades continuously welded to a convex hub. A standard square key and set screws or tapered bushing shall securely lock the propeller to the shaft.

C. Ground and polished steel fan shafts shall be mounted in permanently lubricated, sealed ball bearing pillow blocks.

D. Bearings shall be sized for a minimum average life in excess of 200,000 hours at maximum cataloged operating speeds.

E. Drives shall be sized for a minimum of 150% of driven horsepower.

F. Pulleys shall be fully machined cast iron type, keyed and securely attached to the wheel and motor shafts.

G. Drive frame assemblies shall be formed steel construction. Fan panels shall have prepunched mounting holes, formed flanges with welded corners and deep formed inlet venturi.

H. Greenheck Models SBS and SBE, or equal.

2.06 ROOF MOUNTED CENTRIFUGAL EXHAUST FANS

A. Housings shall be constructed of heavy gauge spun aluminum with a rolled bead. Curb cap shall be one piece, aluminum with deep spun venture inlet and prepunched mounting holes.

B. Motor and drive housings shall be constructed of aluminum, provide easy access to motors and drives, be isolated from fan discharge air and be positively ventilated with fresh air.

C. Fan wheels shall be constructed of aluminum, be statically and dynamically balanced and backward curved, nonoverloading type.

D. Drives of belt drive fans shall have shafts mounted with heavy duty, permanently lubricated, sealed ball bearings and be equipped with variable pitch, cast iron pulleys.

E. Windband shall be aluminum, with rolled bend for extra strength, and shall direct discharge air upward away from the roof. Windband, curbcap and drain trough shall be joined with a continuous welded leakproof seam.

F. Drain trough shall allow for one-point drainage of water or other residue.

G. Drives shall be sized for a minimum of 150 percent of driven power.

H. Motors shall have permanently lubricated, sealed ball bearings and be factory wired with disconnect switches in the motor compartment.

I. Motor and drive assemblies shall be mounted on vibration isolators.

J. Protective coating for highly corrosive atmospheres (chlorine).

K. Color selection by Architect, submit colors.

L. Insulated aluminum roof curbs min. 12" height.

M. Power operated damper mounted at roof curb.

N. Bird screen.

O. Greenheck Models CUE and CUBE, or equal.

2.07 ROOF MOUNTED CENTRIFUGAL EXHAUST FANS (SPARK RESISTANT)

A. Housings shall be spark resistant type "A" AMCA construction, heavy gauge spun aluminum with a rolled bead. Curb cap shall be one piece, aluminum with deep spun venture inlet and prepunched mounting holes.

B. Motor and drive housings shall be constructed of aluminum, provide easy access to motors and drives, be isolated from fan discharge air and be positively ventilated with fresh air.

C. Spark resistant fan wheels shall be constructed of aluminum, be statically and dynamically balanced and backward curved, nonoverloading type.

D. Drives of belt drive fans shall have shafts mounted with heavy duty, permanently lubricated, sealed ball bearings and be equipped with variable pitch, cast iron pulleys.

E. Windband shall be aluminum, with rolled bend for extra strength, and shall direct discharge air upward away from the roof. Windband, curbcap and drain trough shall be joined with a continuous welded leakproof seam.

F. Drain trough shall allow for one-point drainage of water or other residue.

G. Drives shall be sized for a minimum of 150 percent of driven power.

H. Explosion-proof motors shall be totally enclosed, heavy duty type with permanently lubricated, sealed ball bearings and be factory wired with disconnect switch (NEMA 7) in the motor compartment.

I. Motor and drive assemblies shall be mounted on vibration isolators.

J. Color selection by Architect, submit colors.

K. Insulated aluminum roof curbs min. 12" height.

L. Power operated damper mounted at roof curb.

M. Bird screen

N. Greenheck Models CUE and CUBE, or equal.

2.08 WALL MOUNTED CENTRIFUGAL EXHAUST FANS

A. Housings shall be constructed of heavy gauge spun aluminum with a rolled bead. Wall cap shall be one piece, aluminum with deep spun venture inlet and prepunched mounting holes.

B. Motor and drive housings shall be constructed of aluminum, provide easy access to motors and drives, be isolated from fan discharge air and be positively ventilated with fresh air.

C. Fan wheels shall be constructed of aluminum, be statically and dynamically balanced and backward curved, nonoverloading type.

D. Drives of belt drive fans shall have shafts mounted with heavy duty, permanently lubricated, sealed ball bearings and be equipped with variable pitch, cast iron pulleys.

E. Windband shall be aluminum, with rolled bend for extra strength, and shall direct discharge air away from the wall. Windband and wall shall be joined with a continuous welded leakproof seam.

F. Drives shall be sized for a minimum of 150 percent of driven power.

G. Motors shall have permanently lubricated, sealed ball bearings and be factory wired with disconnect switches in the motor compartment.

H. Motor and drive assemblies shall be mounted on vibration isolators.

I. Protective coating for corrosive (acid) atmosphere.

J. Color selection by Architect, submit colors.

K. Gravity damper mounted in wall sleeve. Provide protective grille for damper.

L. Bird screen.

M. Greenheck Models CW, or equal.

2.09 CEILING MOUNTED PENDANT FANS

A. Provide high quality fan suitable for commercial installation.

B. 48", 3-blade fan.

C. Coordinate pendant rod length with roof structure.

D. Provide wall-mounted on-off (high/medium/low) fan speed control switch.

E. Secondary support cable and anchoring.

G. Acceptable Manufacturers: Dayton, or equal.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Supply and install sheaves as necessary for final air balancing. Provide permanent adjustable sheave which will allow final balancing point at approximate mid-range of adjustment, to allow future adjustments in either direction.

B. Do not operate fans for any purpose, temporary or permanent, until ductwork is clean, filters in place, bearings lubricated, and fan has been run under observation.

C. Install fans per the manufacturers' recommendations and all codes.

- END OF SECTION -

SECTION 15890

DUCTWORK

PART 1 - GENERAL

1.01 WORK INCLUDED

Low pressure ductwork.

1.02 REFERENCES

A. ASHRAE - Handbook of Fundamentals; latest edition-Duct Design.

B. ASHRAE - Handbook of Equipment; latest edition-Duct Construction.

C. ASTM A90 - Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles.

D. ASTM A 167 - Stainless and Heat-Resisting Chromium - Nickel Steel Plate, Sheet, and Strip.

E. ASTM A 525 - General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.

F. ASTM A 527 - Steel Sheet, Zinc-Coated (Galvanized) by Hot-Dip Process, Lock Forming Quality.

G. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

H. NFPA 90B - Installation of Warm Air Heating and Air Conditioning Systems.

I. SMACNA - Low Pressure Duct Construction Standards.

J. SMACNA - High Pressure Duct Construction Standards.

K. UL 181 - Factory Made Air Ducts and Connectors.

1.03 DEFINITIONS

A. Duct Sizes: Inside clear dimensions. For lined ducts, maintain sizes inside lining.

B. Low Pressure: Three pressure classifications: 1/2 inch WG positive or negative static pressure and velocities less than 2,000 fpm; 1 inch WG positive or negative static pressure and velocities less than 2,500 fpm, and 2 inch WG positive or negative static pressure and velocities less than 2,500 fpm.

1.05 REGULATORY REQUIREMENTS

Construction ductwork to NFPA 90A and NFPA 90B standards. All ductwork to conform to the State and Local Mechanical Building Codes.

1.06 SUBMITTALS

Submit shop drawings and product data for all material and equipment listed under this section.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Non-combustible or conforming to requirements for Class 1 air duct materials, or UL 181.

B. Steel Ducts: ASTM A525 or ASTM A527 galvanized steel sheet, lock-forming quality, having zinc coating of 1.25 oz. per sq. ft. for each side in conformance with ASTM A90.

C. Aluminum Ducts: ANSI/ASTM B209; aluminum sheet, alloy 3003-H14. Aluminum Connectors and Bar Stock: Alloy 6061-T6 or of equivalent strength.

D. Flexible Ducts: Interlocking spiral of galvanized steel or aluminum construction or fabric supported by helically wound spring steel wire or flat steel bands; rated to 2 inches WG positive and 1.5 inches WP negative for low pressure ducts.

E. Insulated Flexible Ducts: Flexible duct wrapped with flexible glass fiber insulation, enclosed by seamless aluminum pigmented plastic vapor barrier jacket; maximum 0.23 K value at 75oF.

F. Fasteners: Rivets, bolts, or sheet metal screws.

G. Sealant: Non-hardening, water resistant, fire resistive, compatible with mating materials; liquid used alone or with tape, or heavy mastic.

H. Hanger Rod: Steel, galvanized, threaded both ends, threaded one end, or continuously threaded.

2.02 LOW PRESSURE DUCTWORK

A. Fabricate and support in accordance with SMACNA Low Pressure Duct Construction Standards and ASHRAE handbooks, except as indicated. Provide duct material, gauges, reinforcing, and sealing for operating pressures indicated.

B. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts. No variation of duct configuration of sizes permitted except by written permission.

C. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows are used, provide air foil turning vanes. Where acoustical lining is indicated, provide turning metal vanes.

D. Increase duct sizes gradually, not exceeding 15E divergence wherever possible. Divergence upstream of equipment shall not exceed 30E; convergence downstream shall not exceed 45E.

E. Provide easements where low pressure ductwork conflicts with piping and structure. Where easements exceed 10 percent duct area, split into two ducts maintaining original duct area.

F. Connect flexible ducts to metal ducts with draw bands. Limit flexible duct to four (4) feet in length.

G. Use crimp joints with or without bead for joining round duct sizes 8 inch and smaller with crimp in direction of air flow.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Plenums shall be sturdily constructed with structural iron stiffeners as required to insure a vibration free system. All plenums shall be constructed in strict accordance with the latest edition of SMACNA's Low Velocity Manual. Provide drain pans for plenums where required. Pans shall be one-piece 18 gauge galvanized sheet metal with edges turned up three inches (3"). Joints will be permitted only if soldered. Paint interior of drain pans with a heavy coat of bitumastic paint.

B. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.

C. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

D. Ductwork access doors shall be installed as required. Fabrication shall be galvanized steel with sealing gaskets and quick fastening locking devices in accordance with SMACNA Low Pressure Duct Construction Standards. Access doors with sheet metal screws are not acceptable. Hardware for doors shall be Vent-fabrics, Young Regulator Company, or United Sheet Metal, equal to Vent-fabrics, "Ventlok", as follows:

1. Small doors (16" maximum side, or smaller) shall have No. 100 latches.

2. Large doors (18" side or larger) shall have No. 310 latches.

3. Doors in medium pressure ductwork shall be equipped with No. 310 latches, regardless of size.

E. Where access doors are installed in insulated ductwork, doors shall be double panel construction, insulated internally with a minimum of one inch (1") fiber insulation, and set flush with outside surface of duct insulation.

F. Access doors shall be UL labeled.

G. Connect terminal units to medium pressure ducts directly or with one foot maximum length of flexible duct. Do not use flexible duct to change direction.

H. Connect diffusers to low pressure ducts with four feet maximum length of flexible duct. Hold in place with strap or clamp.

I. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

3.02 ADJUSTING AND CLEANING

Clean duct systems with high power vacuum machines. Protect equipment which may be harmed by excessive dirt with filters, or bypass during cleaning. Provide adequate access into ductwork for cleaning purposes.

- END OF SECTION -

SECTION 15910

DUCTWORK ACCESSORIES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Volume control dampers.

B. Backdraft dampers.

C. Air turning devices.

D. Flexible duct connections.

1.02 REFERENCES

NFPA 90 - Standard for the Installation of Air Conditioning and Ventilating systems.

1.03 QUALITY ASSURANCE

A. Accessories shall meet the requirements of NFPA 90.

B. Fabricate in accordance with ASHRAE handbooks and SMACNA duct manuals.

1.04 SUBMITTALS

A. Submit shop drawings, product data and manufacturer's instructions for all equipment listed under this section.

B. Submit shop drawings of factory fabricated assemblies.

C. Submit samples of shop fabricated assemblies as requested.

PART 2 - PRODUCTS

2.01 VOLUME CONTROL DAMPERS

A. Fabricate in accordance with SMACNA Low Pressure Duct Construction Standards.

B. Fabricate splitter dampers of material same gage as duct to 24 inches size in either direction, and two gages heavier for sizes over 24 inches.

C. Fabricate splitter dampers of double thickness sheet metal to streamline shape. Secure blade with continuous hinge or rod. Operate within minimum 1/4 inch diameter rod in self aligning, universal joint action flanged bushing with set screw.

D. Fabricate single blade dampers for duct sizes to 9-1/2 x 30 inch.

E. Fabricate multi-blade damper of opposed blade pattern with maximum blade sizes 12 x 72 inch. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.

F. Except in round ductwork 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon or sintered bronze bearings.

G. Provide locking, indicating quadrant regulators on single and multi-blade dampers. Where rod lengths exceed 30 inches provide regulator at both ends.

H. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.

I. Manual Dampers: Provide at all locations shown on the Drawings. Damper blades shall be 316 gauge steel, securely connected steel shafts having brass bearings. Frames shall be 2" x 1/2" x 1/8". Entire damper assembly shall be painted black, or galvanized.

1. Dampers in ductwork of 12" depth or less shall be single blade type with extended shaft for damper quadrant. Dampers shall be Airstream, Model PBD-5, or approved equal.

2. Dampers in ductwork of greater than 12" depth shall be opposed blade type, complete with tie rods, and with extended shaft for damper quadrant. Blades shall be 6" width, maximum. Dampers shall be Airstream, Model OBD-11, or approved equal.

J. Round Duct Dampers:

1. Dampers shall be Heavy Duty Round Ruskin CDR-25, CDR-82, or equal.

2. Provide 2" x 1/2" x 1/8" channel frame, 12 gauge steel blade, stainless steel bearings, 1/2" x 1/4" bar blade stop, galvanized finish throughout. Provide urethane blade edge seal. Provide 1/2" axle extended 6" from frame. Provide locking hand quadrant at those locations where operators are not mounted.

3. Comparable dampers as manufactured by Airline or Air Factors, will be considered equal.

K. Damper Quadrants: Quadrants shall have indicators showing open and closed positions, and shall be Ventfabrics, "Ventlok", as follows:

1. Dampers with shaft length 12" or less - No. 620 for base ductwork and No. 637 for insulated ductwork.

2. Dampers with shaft length longer than 12" - No. 637.

L. Splitter Dampers: Fabricate from 16-gauge steel with a hemmed leading edge; training edge shall be pivoted on a rod or hinges; install in accordance with the latest edition of SMACNA's Low Velocity Manual. Secure rod to leading edge of damper and extend rod through side of ductwork using Ventlok #603 ball joint bracket with set screw.

2.02 BACKDRAFT DAMPERS

A. Gravity backdraft dampers, size (18 x 18 inches or smaller), furnished with air moving equipment, may be air moving equipment manufacturers standard construction.

B. Fabricate multi-blade, parallel action gravity balanced backdraft dampers of 16 gage galvanized steel with blades of maximum 6 inch width, with felt or flexible vinyl sealed edges, linked together in rattle free manner with 90 degree stop, steel ball bearings, and plated steel pivot pin; adjustment device to permit setting for varying differential static pressure.

2.03 AIR TURNING DEVICES AND EXTRACTORS

A. Multi-blade device with radius blades attached to pivoting frame and bracket, steel or aluminum construction, with push-pull operator strap worm drive mechanism with 18 inch 450 mm long removable key operator.

B. Turning vanes shall be installed in low pressure duct in all square turns and where indicated and shall be fabricated as recommended by SMACNA or shall be Barber-Colman Company, Titus, Airturns, or equal. No projecting edges will be permitted inside ducts. Radius elbows shall be made with the radius of the center line of the duct equal to 1.5 times the width of the duct; where a smaller radius is required use guide vanes.

2.04 ACCEPTABLE MANUFACTURERS - FLEXIBLE DUCT CONNECTIONS

A. Duro-Dyne.

B. Ventfabrics.

C. U.S. Rubber.

2.05 FLEXIBLE DUCT CONNECTIONS

A. Fabricate in accordance with SMACNA Low Pressure Duct Construction Standards, unless otherwise indicated.

B. UL listed fire retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 20 oz. per sq. yd. For low pressure ducts secured with ship locks; 30 oz. high pressure ducts secured with bolted angles. Provide at all duct connections to fans, air handling units, etc.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install accessories in accordance with manufacturer's instructions.

B. Provide balancing dampers at points on low pressure supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Use splitter dampers only where indicated.

C. Provide balancing dampers on medium pressure systems where indicated.

D. Provide backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.

E. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment. Cover connections to medium pressure fans with leaded vinyl sheet, held in place with metal straps.

F. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, and elsewhere as indicated. Provide minimum 8 x 8 inch size for hand access, 18 x 18 inch size for shoulder access.

G. Crossbreak all low pressure duct in excess of 18" in width or depth except that internally lined ducts over 18" shall be reinforced with angles.

H. Ducts shall be hung by angles, rods, straps, trapeze, etc., in strict accordance with SMACNA's recommended practices. There shall be not less than one (1) set of hangers for each section of duct work.

- END OF SECTION -

SECTION 15936

TERMINAL DEVICES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Diffusers, Grilles and Registers

B. Outside Wall Louvers and Gravity Shutters

C. Roof Ventilators

1.02 QUALITY ASSURANCE

A. Make air flow tests and sound level measurements in accordance with applicable ADC equipment test codes and ASHRAE standards.

B. Manufacturer shall certify cataloged performance and ensure correct application of air inlet and outlet type.

1.03 SUBMITTALS

A. Submit shop drawing and product data for all material specified under this section.

B. Submit product data and shop drawings covering each item, together with schedule of inlets and outlets.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Diffusers, Grilles, and Registers: Where manufacturer and model are indicated, equivalent equipment from Carnes, Krueger, Metallaire or Hart and Cooley will be acceptable.

B. Louvers: Where manufacturer and model are indicated, equivalent equipment from Louvers and Dampers, Inc., or Ruskin will be acceptable.

C. Roof Ventilators: As manufactured by Greenheck, Ruskin, Vent Products, or equal.

2.02 APPLICATION

A. Rate units in accordance with ADC standards.

B. Base air outlet application on space noise level of NC 30 maximum unless indicated otherwise.

C. Provide supply outlets with sponge rubber seal around edge.

D. Provide baffles to direct air away from walls, columns, or other obstructions within the radius of diffuser operation.

E. Provide plaster frame for diffusers located in plaster surfaces.

F. Provide anti-smudge frames or plaques on diffusers located in rough textured surfaces such as an acoustical plaster.

2.03 DIFFUSERS, GRILLES AND REGISTERS

A. Provide diffusers, grilles, and registers as scheduled on the drawings or equivalent models by specified acceptable manufacturers.

B. Neck velocity of supply diffusers shall not exceed 700 feet per minute and total friction loss shall be less than 0.10" water column.

C. Devices shall be provided with face operable opposed blade, radial, or butterfly dampers adjustable from the face of the device.

D. Face velocity of return and/or exhaust grilles and registers shall not exceed 800 feet per minute. Total friction loss shall be less than 0.05" water column.

2.04 OUTSIDE WALL LOUVERS AND GRAVITY SHUTTERS

A. Frame: Extruded 6063T5 aluminum; minimum section thickness .125"; provide integral caulking recess.

B. Blades: Fixed (louvers) storm proof "K" blades, 6063-T5 aluminum; minimum section .125"; spaced on 6" centers. Gravity shutter blades shall pivot.

C. Construction: Stainless steel screws; multiple sections made equal size; no visible mullions in width; vertical mullion plates supplied.

D. Maximum panel size: 72" W x 144" H or 96" W x 72" H.

E. Finish: Anodized finish; submit color selection with shop drawings.

F. Bird Screens: PVC coated aluminum wire, 1/2" square mesh.

G. Provide extended sill, side closures, wall sleeve and wall mounting collar, caulk and sealants as required for the application.

H. Provide protective coatings for corrosive, chlorine and/or high moisture atmospheres.

I. Maximum velocity through louver shall be 800 feet per minute with a maximum friction loss of 0.07" water column.

2.05 GRAVITY VENTILATORS AND PENTHOUSES

A. All aluminum construction 0.08" thickness minimum.

B. Bird screen, 1/2" square mesh.

C. Anodized finish, color selection by Architect/Engineer.

D. Storm-proof fixed louvers for penthouses with no visible mullions.

E. Standard roof curb collar arrangement.

F. Ratio between the hood perimeter opening and the throat opening shall be 2 to 1.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install items in accordance with manufacturer's instructions.

B. Paint ductwork visible behind air outlets matte black.

- END OF SECTION -

SECTION 15990

TESTING, ADJUSTING AND BALANCING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Hydrostatic testing of all installed piping systems.

B. Balancing of air systems.

C. Adjustment of all controls and equipment necessary to ensure a complete, working installation.

PART 2 - PRODUCTS

2.01 QUALITY ASSURANCE

A. Balancing work shall meet the specific requirements of the Associated Air Balance Council (AABC) or National Environmental Balancing Bureau (NEBB).

B. Work will be done under applicable standards of Sheet Metal and Air Conditioning Contractor's Association (SMACNA).

C. Balancing work shall be closely coordinated with the temperature controls in Section 15952.

PART 3 - EXECUTION

3.01 TESTING, ADJUSTING AND BALANCING

A. Provide all equipment and instrumentation necessary to perform tests as required.

B. Tests will be performed following completion of the installation of the system under the direction of the Engineer.

C. Adjust and regulate the completed system under actual operating conditions for both heating and cooling seasons to produce a satisfactory system. All automatic controls shall be adjusted for satisfactory operation during the first heating season and first cooling season. The testing period shall be not less than six 8-hour days or as required to demonstrate that the requirements of the Contract are fulfilled.

D. Make all required adjustments to the system at no charge to the owner during the first year of operation (not including adjustments due to negligence by the Owner).

E. Performance Tests:

1. Piping shall be hydrostatically tested to a pressure of 150% of the system working pressure. The pressure tests shall be for at least eight hours, during which time pressure shall remain constant without additional pumping. After satisfactory completion of the tests and before permanently connecting equipment, blow and flush piping thoroughly so that all interior of all piping shall be free of foreign matter. All strainers, etc. shall be cleaned following flushing.

2. Air System Balancing: Performance test of each system after balancing, showing actual airflow measurements through each duct, supply, return, and exhaust opening, and static pressure. For belt driven fans, provide and install proper sheave combination to supply specified air quantities with the adjustable pulley in the mid-point of the adjustment range. Supply certified balancing report with all necessary information to be included in the system operation manuals.

- END OF SECTION -

DIVISION 16

ELECTRICAL

SECTION 16050

GENERAL ELECTRICAL PROVISIONS

PART 1 – GENERAL BASIS OF DESIGN

Lighting systems are expected to use less energy than the energy code allows. Do not rely on prescriptive measures to meet the energy code. The light design shall maximize the use of recessed and direct/indirect 2 foot by 4 foot luminaries using two rows of low mercury lamps. Lamps shall be 30,000 + hours rated life for at least 90 percent of all lighting. Ballasts for lamps shall be normal and high-output. Do not use low-output ballasts. Do not use lamps over 48 inches; incandescent, mercury vapor, U-Bend or circline lamps; or lamps less than 13 watts. Typical lamps shall be 3500 K. Use amalgam lamps where compact fluorescent is used in cold or widely variable temperature locations. Select interior lighting to achieve initial system efficiencies greater than 64 lumens per watt.

Listed below are the average maintained foot-candles at work surfaces for this facility and shall be as recommended by UFC 3-520-01 and the IESNA Lighting Handbook and Recommend Practices. Switching shall be provided for all areas and appropriate areas shall be provided with multiply switching.

50 – Offices, Kitchen
42 – Conference Room, Garage Bay Area
20 – Restrooms
15 - Hallways

General purpose receptacles shall be provided throughout the building according to the Kentucky Building Code and NEC. Receptacles in restrooms, garage, and kitchen shall have GFI protection.

Office lighting shall be recessed 2' x 4' fluorescent fixtures, 120 volt, T-8 ballasts

Garage office shall be surface mounted 2' x 4' fluorescent fixtures, 120 volt, T-8 ballasts.

Garage lighting shall be 24" metal halide sodium filled lights, 120 volt, T-8 ballasts.

The emergency and egress lighting shall be provided throughout the building. Wall mounted emergency battery units to achieve the stringent illumination criteria of the latest NFPA 101 – Life Safety Code shall be provided. The exit lights shall be provided with highly efficient LED type signs with integral sealed Ni-Cad batteries.

Communication System – Telephone/Data: A new telephone service will be provided with telephone access in all rooms with the exception of the restrooms and kitchen. All offices shall be wired for data communications/computer wiring.

All wiring systems shall be installed in metal conduits with copper conductors. Design standards shall be in accordance with Unified Facilities Criteria (UFC), Interior Electrical System (UFC 3-520-01), NFPA, and the NEC.

An intrusion detection system will **not** be required in this contract.

Any realignment of the existing electrical lines shall be the responsibility of the owner.

The contractor shall be responsible for the relocation of the existing base antenna and MTU telemetry system from the existing office to the new office building immediately after the transformation from the old facility to the new.

All electrical work shall be performed by an electrician that is certified in the state of Kentucky and in accordance the NEC and with all applicable codes.

1.01 WORK INCLUDED

A. The Instructions for Bidders, General Conditions, Supplementary Conditions, Division 1 of the Specifications and all Contract Documents shall apply and govern the work of all sections in this Division regardless of how the work may be apportioned to various trades or subcontractors. If any discrepancies are discovered between the Basic Electrical Requirements and General Requirements, the above mentioned documents shall overrule this section. The Basic Electrical Requirements are intended as a supplement to the above mentioned documents.

B. Each CONTRACTOR bidding on the work included in these Specifications and shown on the Drawings shall view the building site and carefully examine the Contract Drawings and Specifications, so that he/she may fully understand what is to be done.

1.02 SCOPE

The Contractor shall furnish all labor, materials, tools, excavation, backfill and other equipment necessary to install the electrical system as listed below and as shown on the contract drawings and specified herein.

A. Low voltage distribution.

B. Panelboards.

C. Switchboard.

D. Reduced voltage solid state starters.

E. Dry type transformers.

F. Receptacle outlets, switches, and other small power outlets.

G. Motor control and safety disconnect switches.

H. Control system wiring.

I. All conduit, wire, junction boxes, terminal cabinets and accessories for all electrical and instrumentation systems.

J. Lighting.

K. Grounding.

L. Coordinate power distribution by utility company.

M. Connections to all motors, heaters, thermostats, and all other items of utilization equipment except as otherwise specified.

N. Connect power and signal lines to all instrumentation equipment, and accessories.

O. Equipment connections shall be made with flexible or rigid conduit as shown and specified. Controllers for motors, disconnect switches, and all control, protective and signal devices for motor circuits, except where such apparatus is furnished mounted and connected integrally with the

motor driven condition. The number and size of conductors between motors and control or protective apparatus shall be as required to obtain the type of operation described in these Specifications and/or by the Contract Drawings and/or as shown in manufacturer furnished, ENGINEER reviewed shop drawings.

P. All devices and items of electrical equipment, including those shown on the Contract Drawings but not specifically mentioned in the Specifications or those mentioned in the Specifications but not shown on the Contract Drawings, are to be furnished under this section of the Specifications. Any such device or item of equipment, if not defined in quality, shall be equal to similar equipment and/or devices specified herein.

Q. All devices and items of equipment mentioned in this section of the Specifications whether electrical or not or whether furnished under this or other divisions of the Specifications, shall be installed under this division of the Specifications, unless specifically indicated otherwise.

R. Where control diagrams are not shown on the Contract Drawings, they are to be provided by the supplier of the equipment served and such diagrams shall be adhered to except as herein modified.

1.03 SUBMITTALS

A. Shop drawings, clearly marked to show only items applicable to this specific contract, shall be submitted for review in accordance with requirements as follows:

1. All efforts will be made to review shop drawings as quickly as possible. The Contractor can expect that shop drawings submitted will be reviewed by the Engineer and disposition made within two (2) weeks after receipt by the Engineer.

2. Shop drawings for each required item shall contain manufacturer's drawings, bills of material, panel and equipment layouts, data, and information for each assembly submitted in one package insofar as possible. Partial submittals may be returned without action.

3. Manufacturers standard publications which form a part of the submittal shall be clearly marked to indicate the exact item being submitted. This type of submittal which is not marked will be returned without action. Non-applicable items shall be crossed out, blanked out, or otherwise deleted.

4. Early submission shall be made of certain drawings where dimensions of equipment, location of conduit entrances, etc., are important to facilitate construction.

5. Shop drawings shall include one line diagrams, schematic diagrams and wiring diagrams. Other Drawings, such as control sequence diagrams, relay diagrams, etc. may also be needed. Each drawing shall be complete, showing all local and remote devices associated with each item or system.

6. The Engineer reserves the right of acceptance or rejection of equipment. Where the shop drawings representing equipment vary from the intent of the Contract Documents, they will be rejected and correction and a resubmission called for. Fabrication of equipment will not be allowed until corrected drawings have been submitted, reviewed and accepted by the Engineer. NO EQUIPMENT WILL BE VERBALLY ACCEPTED AND ACCEPTANCE OF EQUIPMENT PRIOR TO THE BID OPENING WILL NOT BE FORTHCOMING.

7. A list of the type and make of switchboard, panelboard and motor control equipment shall be included with the bid for preliminary acceptance or rejection at the bid opening. Acceptance at the bid opening does not relieve the Contractor of the responsibility of submitting shop drawings when they are required by the specifications. Even though a particular manufacturer may be accepted, the specific item involved must be accepted at the time of shop drawing submittal before the item is fabricated or released for shipment.

8. When the Engineer cannot make a proper determination from the submitted shop drawing as to whether an item meets the requirements, additional information may be sought or, in certain cases, a sample of the item in question requested. The Contractor shall provide the Engineer with this information or sample as soon as possible after the request has been made so as not to deter construction progress. Samples will be returned as soon as the Engineer has made his determination. The Engineer reserves the right, however, to fully test the sample and to disassemble it if necessary to gain full information. While care will be taken not to damage the sample, no guarantee is made or implied that the sample will be in working order or even repairable when returned.

9. As soon as possible after the award of contract, the Contractor shall submit all information and data on the wires, cables, and other long delivery items he proposes to use. Early submission for review and early ordering is required to avoid delays in completion of the work.

B. Shop drawings will be required on the following materials specified in this division:

1. Conduit - all types and sizes.

2. Boxes - all types and sizes.

3. Wiring devices.

4. Device plates.

5. Metal framing system.

6. Conduit fittings, expansion joints, support hardware.

7. Motor control equipment - including individually mounted items.

8. Power distribution equipment - including individually mounted items.

9. Miscellaneous spare parts and hardware, i.e, terminators, lugs, etc.

10. Wire - all types and sizes.

11. Light fixtures - all types.

12. Wire markers, signs and labels.

13. Transformers.

14. Reduced voltage solid state starters.

C. At the completion of the contract, the Contractor shall prepare three (3) copies of a manual which shall include the items mentioned above as well as the following:

1. A record copy of all shop drawings marked "No Exception Taken" or like notation by the Engineer and incorporating any changes requested during the time of shop drawing submittal and review.

2. Drawings, pictures, etc. showing each piece of equipment in detail and giving a complete description. Standard publications forming a part thereof shall be marked specifically for this Contract. Any non-applicable items shall be crossed out, blanked out, or otherwise deleted.

3. A complete parts list for each piece of equipment giving the model number and manufacturer of each item as it is listed in the original manufacturer's catalog as well as any other identifying numbers given the equipment by an original equipment manufacturer.

4. Operating and maintenance instructions prepared by the manufacturer for each piece of equipment.

5. An operating section in which step-by-step procedures are given for operation of each major electrical system. This section shall contain drawings and diagrams as required for clarity and instruction. The Owner's representative shall be instructed accordingly.

6. Equipment for which instructions are considered necessary shall include but not be limited to, the following:

   a. Reduced voltage solid state starters.
   b. Switchboard.
   c. Control Panels

7. Each copy of the manual shall consist of a properly sized, hardback, loose-leaf filler into which the information has been properly inserted. The front cover and spine of each loose-leaf filler shall be embossed with letters which read as follows: LOUISA WTP IMPROVEMENTS - CONTRACT NO. 2.

8. When completed, the manuals shall be submitted to the Engineer for approval.

1.04 GUARANTEE AND WARRANTIES

A. The CONTRACTOR shall guarantee all work including equipment, materials, and workmanship. This guarantee shall be against all defects of any of the above and shall run for a period of 1 year from the date of acceptance of the work, concurrent with the one year guarantee period designated for the general construction contract under which electrical work is performed. Date of acceptance shall be considered to be the date on which all "punchlist" items are completed ("punchlist" is defined to be the written listing of work that is incomplete or deficient that must be finished or replaced/repaired before the CONTRACTOR receives final payment).

B. Repair and maintenance for the guarantee period is the responsibility of the CONTRACTOR and shall include all repairs and maintenance other than that which is considered as routine.

1.05 CONTRACTOR'S REPRESENTATIVE

The Contractor shall keep on his work at all times during its progress, a competent foreman satisfactory to the Engineer. The foreman shall not be changed, except with the consent of the Engineer, unless he proves to be unsatisfactory to the Contractor and ceases to be in his employ. The foreman

shall represent the Contractor in his absence and all directives given to him shall be as binding as if given to the Contractor.

1.06 OR EQUAL CLAUSE

The use of the manufacturer's names and catalog numbers used herein is to indicate minimum standards of quality and performance. Where the words "equal to" or "or equal" are used in the particular specification, equipment of equal quality, rating, and performance may be considered by the Engineer. It shall be the sole responsibility of the Contractor to prove equality and if, as a result of substitution, any modifications are necessary to meet the quality and design criteria of the specified material and/or systems, the Contractor shall be responsible for those modifications with no additional charge to the Owner or the Engineer. Any necessary modifications shall be shown on the shop drawings submitted for approval.

1.07 DIMENSION VERIFICATION AND DOCUMENTATION

Scale dimensions as shown on the drawings shall be considered as approximate. The Contractor shall be responsible for making field verifications. Specific attention shall be given to the exact location of any underground lines installed under this contract. These lines shall be dimensioned to easily identifiable points on permanent building structures for location and elevation and these dimensions shall be entered and shown on the record drawings.

1.08 RECORD DRAWINGS

The Contractor shall obtain from the Engineer one (1) set of Blue-Line prints of the Contract Drawings and these prints shall be kept and maintained in good condition at the project site. Where construction differs from the drawings, a qualified representative of the Contractor shall, at the end of each working day, enter upon these prints the actual "as-built" record of any and all changes that have been made during that day's construction progress. These plans will be subject to inspection by the Engineer and, where found not to be up-to-date, shall be updated prior to application for the next applicable partial payment. Entries and notations shall be made in a neat and legible manner and these prints shall be delivered to the Engineer upon completion of the construction. APPROVAL FOR FINAL PAYMENT WILL BE CONTINGENT UPON COMPLIANCE WITH THIS PROVISION.

1.09 CODES

A. The minimum standard for all work shall be the latest revision of the National Electrical Code (NEC). Whenever and wherever state laws and/or regulations and/or the ENGINEER'S design require a higher standard that the current NEC, then these laws and/or regulations and/or the design shall be followed.

B. Following is a list of applicable Standards or Codes:

	Organization/Code/Standard	Abbreviated Title
1.	National Electrical Code	NEC
2.	National Electrical Safety Code	NESC
3.	Underwriters Laboratories, Inc.	UL
4.	Factory Mutual System	FM
5.	National Fire Protection Association	NFPA
6.	National Electrical Manufacturers Association	NEMA
7.	Occupation Safety and Health Administration	OSHA
8.	Insulated Cable Engineers Association, Inc.	ICES
9.	Illuminating Engineering Society of North America	IES
10.	Instrument Society of America	ISA

11.	Institute of Electrical and Electronic Engineers, Inc.	IEEE
12.	Certified Ballast Manufacturers Association	CBM
13.	American National Standards Institute, Inc.	ANSI
14.	Joint Industry Council	JIC
15.	American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc.	ASHRAE

1.10 EXISTING EQUIPMENT

The disconnecting removal and relocation of existing electrical equipment is a part of this contract.

1.11 MATERIALS

A. All materials and equipment installed shall be new and unused and shall be of the latest design of manufacturers regularly engaged in the manufacture of such products that conform with the requirements of the Contract Drawings and Specifications.

B. The material and equipment described herein has been specified according to a particular trade name or make to set quality standards. However, each CONTRACTOR has the right to substitute other material and equipment in lieu of that specified, other than those specifically mentioned as matching or for standardization, providing such material and equipment meets all of the requirements of those specified and is accepted, in writing by the resident ENGINEER.

C. The reuse of salvaged electrical equipment and/or wiring will not be permitted unless indicated on the Contract Drawings.

1.12 APPROVAL AND MARKING OF EQUIPMENT

Electrical devices and materials shall be listed and/or labeled by the Underwriters' Laboratories, Inc., wherever standards have been established by that agency and the equipment shall bear the UL seal. Where Underwriters' Laboratories listing is not available for equipment, the Contractor shall submit certified test reports of an adequately equipped, recognized, independent testing laboratory, approved by the local inspecting authority, indicating that the equipment is in conformance with local code requirements or any other applicable requirements. In lieu of the independent test reports, written approval of the equipment by the local electrical inspecting authority will be acceptable. The Contractor shall bear the costs of tests necessary for approval of equipment.

1.13 IDENTIFICATION MARKERS

A. Machine engraved, laminated plastic identification markers shall be provided as shown below, securely attached by means of at least 2 brass bolts and nuts. Adhesive mounting will not be acceptable.

1. At each disconnect switch, switchboard, starter, panelboard, and transformer, ½" high, white letters on black background indicating equipment name, voltage and phase, location of protective device and circuit number (where applicable):

   Example:
   MCC
   480 V 3 PH
   FEED FROM
   SWBD A
   CIRCUIT 2

2. At each individual motor starter, 1/4" high white letters on black background indicating equipment served, equipment interlocked (where applicable) and location of load and motor horsepower (where applicable).

   Example:
   EXHAUST FAN #1
   INTERLOCKED WITH
   DAMPER #1
   LOCATED ON ROOF
   5 HP

3. At each remote control station, 1/8" high letters on black background indicating equipment served, location of protective device and circuit number.

   Example:
   BACKWASH PUMP
   FEED FROM MCC
   SECTION 7A

4. At each receptacle and instrumentation device in multi outlet assembly, 1/8" letters, white letters on black background indicating location of protective device, location and circuit number. Where receptacle is other than NEMA 5-20R duplex, also indicate amperage and voltage.

   Example:
   FEED FROM PANEL LL-A
   CIRCUIT 8, 208 V, 30 AMPS

B. Each major component of equipment shall have the manufacturer's name, address, and catalog number on a metal plate securely attached to the item of equipment. The nameplate shall be easily readable and care shall be taken during the construction so as not to obscure the nameplate information with paint or other markings. Where applicable, this nameplate shall give information about the equipment as follows:

1. Rated voltage.
2. Rated amperage (on the motor control centers horizontal bus bar rated amperage and vertical bus bar amperage shall be shown).
3. Ground bus ampere rating.
4. Number of phases.
5. Number of poles.
6. Frequency.
7. Horsepower where motor rated.
8. Starter NEMA standard size.
9. Short circuit current interrupting rating in Amperes, RMS, Symmetrical.
10. Short circuit current withstand rating.

C. Where the manufacturer's nameplate gives the rated voltage but the utilization voltage in the equipment is different (such as rated at 600 volts with utilization voltage at 480 volts), the machine engraved, plastic nameplate shall show the actual utilization voltage.

1.14 PROTECTION OF ELECTRICAL EQUIPMENT

A. Electrical equipment shall be protected from the weather, especially from water dripping or splashing upon it, at all times during shipment, storage, and construction. Equipment shall not be stored outdoors even if its enclosure is rated as weatherproof, watertight, etc. Where equipment is installed or stored in moist areas, such as unheated buildings, etc., it shall be provided with an acceptable means of preventing moisture damage such as a uniformly distributed source of heat to prevent condensation.

B. The stored equipment shall be inspected periodically, and if it is found that the protection is inadequate, further protective measures shall be employed.

1.15 DEFECTIVE OR DAMAGED EQUIPMENT

A. Should it be determined by the Contractor, Owner, or Engineer that any equipment or material has been subjected to possible damage by water, it shall be thoroughly dried and put through a dielectric test as directed by the manufacturer, at the expense of the Contractor or shall be replaced by the Contractor without change in contract price. Any equipment found to be marginal or that fails to meet manufacturer's standards shall be replaced at no additional charge to the Owner or Engineer.

B. Any equipment damaged during shipment, while stored, or during construction shall be replaced at the Contractor's expense. Minor scratches on equipment cabinets, etc. may be repaired on site. Any current carrying parts, switch blades, operators, coils, contacts, etc. which are damaged, shall be replaced at no cost to the Owner or Engineer.

1.16 COORDINATION OF WORK WITH OTHER TRADES

The Contract Drawings indicate the extent and general locations of equipment, conduit and wiring. The Contractor shall be responsible for coordination with all trades involved and for changes required in the field to avoid interference of the new equipment with existing facilities. Any change shall be coordinated with the Engineer before the change is made and, if approved, the Contractor shall be responsible for showing the change on the record drawings.

1.17 ERRORS, CORRECTIONS AND/OR OMISSIONS

A. Should a piece of electrically driven equipment be supplied of a different size or horsepower than shown on the Contract Drawings, the CONTRACTOR shall be responsible for installing the proper size wiring, conduit, starters, circuit breakers, etc., for proper operation of that unit and the complete electrical system at no extra cost to the OWNER or ENGINEER.

B. It is the intent of these Specifications to provide for an electrical system installation complete in every respect, to operate in the manner and under conditions as shown in these Specifications and on the Contract Drawings. The CONTRACTOR shall notify the ENGINEER, in writing, of any omission or error prior to opening of bids. In the event of the CONTRACTOR'S failure to give such notice, he/she shall be required to correct work and/or furnish items omitted without additional cost.

C. Necessary changes or revisions in electrical work to meet any code or power company requirements shall be made by the CONTRACTOR without additional charge.

D. The locations of electrical equipment, devices, outlets, and similar items, as indicated on the Drawings, are approximate only. Exact locations shall be as determined or accepted by the Engineer during construction. Any substantial changes shall be as approved by the Engineer and shown as a revision on the record drawings.

E. The electrical, structural, treatment equipment, plumbing, heating, ventilating and air conditioning Drawings and Specifications are complementary to one another. It would behoove the Contractor to study closely ALL drawings and specifications as he will be responsible for furnishing labor and materials for rough-in through final connections of electrical service to any and all equipment requiring it whether furnished by the Contractor, or any of the subcontractors under any of the Contract Documents. The Contractor shall also be responsible for all damages caused by erroneously connected equipment.

F. The Contractor shall field verify the locations of any and all equipment requiring electrical service before rough-in work begins. If the actual location varies substantially from that shown on the Drawings, he shall contact the Engineer immediately for further instructions.

1.18 PERMITS AND APPROVALS

A. The Contractor shall obtain all permits necessary. The Contractor shall furnish inspection by an agency licensed or otherwise qualified to perform electrical inspections in the Commonwealth of Kentucky, City of Louisa.

B. The Contractor shall notify the Electrical Inspector, in writing, immediately upon the start of the work and A COPY OF THE NOTICE SHALL BE SENT TO THE RESIDENT ENGINEER.

C. Inspection shall be scheduled for rough-in as well as finish work. The rough-in inspection shall be divided into as many inspections as may become necessary to cover all roughing-in.

D. All costs incidental to the electrical inspection shall be borne by the Contractor.

E. The Contractor shall furnish certificates of final approval by the electrical inspector and FINAL PAYMENT WILL BE WITHHELD UNTIL HE HAS PRESENTED THE RESIDENT ENGINEER WITH THE AFOREMENTIONED CERTIFICATE OF APPROVAL.

F. When it is determined by the Electrical Inspector that materials, equipment or installations shown on the drawings or specified herein are in violation of the National Electrical Code, the Contractor shall contact the Engineer immediately. The Contractor shall be prepared to tell the Engineer the Articles of the National Electrical Code that are violated by the project requirements.

1.19 CLEANING, PAINTING, CUTTING AND PATCHING

A. Unless otherwise specified, the Contractor shall clean all conduit, equipment and accessories installed under this Contract, and make ready for painting. Painting will be performed under other sections of the Contract. After all work has been completed by all contractors and subcontractors, the Contractor shall thoroughly clean all exposed and visible equipment installed under his contract.

B. Any cutting and patching of building structures for the installation of equipment furnished and installed under the Contract shall be the responsibility of the Contractor. Openings in walls, floors or ceilings required for passage of raceway shall be drilled with a rotary type drill, except that structural members shall not be cut or drilled unless specific written approval is obtained from the Engineer. All surfaces shall be restored to match the existing surface.

1.20 SLEEVES, CHASES AND OPENINGS

A. Sleeves shall be required at all points where exposed conduits pass through concrete walls, slabs, or masonry walls. Sleeves that must be installed below grade or where subject to high water conditions must be installed watertight.

B. Wiring chases shall be provided where shown on the Contract Drawings. The CONTRACTOR shall have the option of installing chases below surface mounted panelboards provided all structural requirements are met.

C. It is the CONTRACTOR'S responsibility to leave openings to allow installation of the complete, operational electrical system. Openings required but not left shall be cut as outlined under cutting and patching.

1.21 CIRCUIT NUMBERS AND CIRCUITRY

Circuit numbers as shown on the Drawings refer to the breaker numbers in the particular panel from which the circuit is fed. The Contractor shall closely follow the circuiting as shown on the drawings and shall install all circuits from the circuit number shown. Any deviation shall have the prior approval of the Engineer before installation and, if approved, shall be shown on the record drawings. Identification of the individual circuits shall be typed on the panel identification cards.

1.22 CIRCUIT LOADS

The Contractor shall verify the total load to be placed on the circuits as well as voltage, phase, frequency and connections required to equipment before rough-in and if they differ from the Plans and Specifications, he shall contact the Engineer immediately for further instructions before the work commences.

1.23 TESTS AND INSPECTIONS

A. The Contractor shall provide all tests as specified herein and all additional tests necessary to establish the adequacy, quality, safety completed status and suitable operation of each system and components thereof. The final inspection will be made after the Engineer is satisfied that the work has been completely installed and that complete preliminary tests were made which indicate the adequacy, quality, completion and satisfactory operation of the system.

B. See Section 16950 - ELECTRICAL FIELD ACCEPTANCE TESTS for specific testing required.

1.24 EXCAVATION, BACKFILLING AND GRADING

A. The Contractor shall perform all earth and rock excavation, backfilling and grading required for this part of the work. Rock excavation shall be made to a depth of 4 inches below pipe and filled to subgrade with dense graded aggregate limestone. If for any reason, the Contractor wishes additional information, he shall, at his own expense, make whatever soundings that he deems necessary before submitting his bid. After the bid is submitted there will be no additional funds forthcoming for excavation work on this project. All excavation shall be bid as unclassified.

B. Trenches shall be maintained free of water until backfilling is completed.

C. Backfilling material in earth excavation shall be 3 inches of sand on sides, top and bottom of conduits, then clean earth from this line upward. Filling shall be thoroughly tamped in 6 inch layers to the finished grade. All surplus rock and earth shall be removed from the site.

D. Depth of bury for all conduit shall be as shown on the Drawings. Conduit below slab may be a minimum of 2 inches below bottom of slab.

1.25 REMOVAL AND RELOCATION OF MATERIAL AND EQUIPMENT

A. The Contractor shall remove electrical equipment, switches, fixtures, conduit, cables, wiring, etc. as necessary to carry out the proposed work and as shown on the Contract Drawings.

B. Where conduit which is not to be reused is concealed in walls, in or below slabs, or underground, it shall be cut below the surface, the wire (if any) pulled out and the conduit abandoned. The surface shall be patched or otherwise restored to match the surrounding area. Where existing exposed conduit or other equipment is not to be reused, it shall be removed.

C. Conduit and wire, miscellaneous wiring devices, device plates, device boxes, junction boxes, lighting fixtures, etc. shall become the property of the Contractor and shall be removed from the site. Major equipment such as safety switches, motor controllers, etc. which are not to be reused under this Contract shall be turned over to the Owner and delivered by the Contractor to a site as directed by the Owner.

D. Where equipment is to be reused at its existing location, it shall be protected from damage during the various phases of construction and reconnected in place. Where equipment is to be relocated, it shall be removed, stored in a location where it is protected from weather and any other form of possible damage, then reinstalled and reconnected.

1.26 CONCRETE PADS

Any concrete pads shown on the drawings or otherwise required for the proper setting of electrical equipment shall be placed by this Contractor taking into account manufacturer's recommendations and actual weight and dimensions of the equipment involved.

1.27 MAINTAINING CONTINUOUS ELECTRICAL SYSTEM AND SERVICE

A. The water treatment plant as it presently exists, will continue to operate during the new expansion construction period. Where necessary, temporary wiring and other equipment shall be provided to keep equipment in operation during times when new connections are being made, equipment relocated, etc. "Temporary wiring" includes all wire, conduit, overcurrent devices, etc. required for a safe and operable temporary system.

B. When it is absolutely necessary for certain equipment to be out of operation while it is removed from the existing distribution system and reconnected to the new distribution system, all conduit, wire, starters, disconnects, etc. shall be installed prior to the shutdown so that the down time will be just long enough to disconnect one set of conductors and connect another. Down time on operating equipment shall be kept to an absolute minimum and fully coordinated in advance with the City, their plant operating personnel, and the Engineer.

C. The electrical contractor shall coordinate with the General Contractor and other subcontractors as regards the construction sequence so that temporary wiring, where necessary, can be installed in a timely manner and with a minimum of down time for the plant operations.

1.28 POWER COMPANY METERING EQUIPMENT

Any special metering provisions required by the serving electrical utility shall be as advised by the utility at the time of construction, and work required by these special provisions shall be executed with no extra cost to the OWNER or ENGINEER.

1.29 TEMPORARY ELECTRICAL POWER

A. The CONTRACTOR shall be responsible for providing temporary electrical power as required during the course of construction and shall remove temporary service equipment when no longer required.

B. During construction of the project, the Contractor shall take precautions to avoid excessive electrical usage. Any abnormal electrical utility charges, due to Contractor's negligence, shall be reimbursed to the Owner.

1.30 TRAINING

A. All manufacturers supplying equipment for this division shall provide the OWNER'S operations staff with training in the operation and maintenance on the equipment being furnished. The training shall be conducted at the project site by a qualified representative of the manufacturer.

B. The cost of this training shall be included in the bid price.

C. The required training shall consist of both classroom and hands-on situation. Classroom training shall include instruction on how the equipment works, its relationship to all accessories and other related units, detailed review of shop drawings, detailed presentation of written O&M instructions, troubleshooting and record-keeping recommendations. Hands-on training shall include a review of the manufacturer's O&M instructions, check out of each operator to identifying key elements of the equipment, tear down as appropriate, calibration, adjustment, greasing and oiling points, and operating manipulations of all electrical and mechanical controls.

D. The training shall be scheduled through the CONTRACTOR with the OWNER. The timing of the training shall closely coincide with the startup of the equipment, but no training shall be conducted until the equipment is operational.

E. At least 60 days prior to the training the manufacturer shall submit through the CONTRACTOR to the ENGINEER an outline of the training proposed for the ENGINEER'S review and concurrence.

1.31 GROUNDING AND BONDING

All metallic conduit, cabinets, equipment and service shall be grounded in accordance with the latest issue of the National Electrical Code. All starter panel supporting framework and other metal or metal clad equipment or materials which are in contact with electrical conduit, cable and/or enclosures, shall be properly grounded to meet the code requirements.

- END OF SECTION -

SECTION 16120

WIRE AND CABLE (CONDUCTORS)

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Provide all labor, materials, equipment and services required for the furnishing of all wire, cable, and their installation to provide a complete and fully operable electrical system as detailed on the Drawings and/or hereinafter specified.

B. All wire and cable shall conform to the latest requirements of the NEC and shall meet all ASTM/UL specifications. Wire and cable shall be new; shall have size, grade of insulation, voltage rating and manufacturer's name permanently marked on the outer covering at regular intervals. Complete descriptive literature shall be submitted to the ENGINEER for review and acceptance prior to installation.

C. Wire and cable shall be suitably protected from weather and damage during storage and handling and shall be in first class condition when installed.

1.02 SUBMITTALS

A. Catalog data on conductors.

B. Certification date on conductors.

C. Testing reports.

1.03 RELATED WORK

A. Section 16050 - General Electrical Provisions.

B. Section 16110 - Raceways.

C. Section 16121 - Wire Connections and Connecting Devices.

D. Section 16450 - Secondary Grounding.

E. Section 16950 - Electrical Field Acceptance Testing.

F. Section 17000 - Instrumentation.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Building Wire (types "THWN" and "THW"-cu.) - "Rome," "American," "Carol," or equal.

B. Flexible Cords and Cables (Types "SO" (600V) "SJO" and "SVO" -300V)," "American," "Carol," or equal.

C. Power cables, for conduit installation or direct-burial (600V) - "Anaconda," "Okonite," "Triangle PWC," or equal.

D. Control Cables (Shielded or unshielded) 600V max. - "Belden," "Okonite," or equal.

E. Instrumentation Cables (Shielded) 600V mx. - "Alpha," "American," "Belden," "Okonite," or equal.

2.02 MATERIAL

A. Conductors (600 Volts and Below): Conductors meeting requirements below will be suitable for circuits rated at 600 volts and below.

1. All conductors shall be insulated so that they are rated at 600 volts.

2. Insulated conductors AWG No. 8 and larger shall be stranded. Conductors smaller than AWG No. 8 shall be solid. NOTE: Conductors smaller than AWG No. 8 which will be terminated in box type lugs or which will be terminated with spade or forked terminals may be stranded.

3. All conductors brought to the job site shall be new and unused and where no special factory cut lengths are involved, shall be delivered to the job site in standard coils. Contractor shall provide verification to the resident Engineer of wire condition before wire is installed.

4. No conductors smaller than AWG No. 12 shall be used except for signal or control systems, or where otherwise indicated.

5. All conductors shall be soft drawn, 98% conductivity copper conforming to the latest ASTM Specifications and the requirements of the National Electrical Code.

6. Conductors shall be insulated with THW insulation and all conduits shown on the Drawings are sized accordingly. At the Contractor's option, THWN insulation may be substituted.

7. Wiring adjacent to heat producing equipment and not subject to dampness or moisture shall be type TFE.

8. Conductors for rewiring in existing conduit shall be Type XHHW. Where conductors share existing conduit with other conductors, all conductors shall be removed and replaced with type XHHW.

B. Direct Burial Cable: No cable buried directly in the earth, not in raceway will be allowed on this project.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Wire and Cable (600 Volts and Below):

1. Wire shall not be installed until all work of any nature that may cause injury to the wire is completed.

2. Mechanical means shall not be used in pulling in wires No. 8 or smaller.

3. Approved wire pulling lubricant shall be used as required to prevent insulation damage and overstressing of the wire while pulling through conduit. In no case

shall conductors be greased or coated with any substance injurious to the conductor insulation or sheath.

4. Panelboard Wiring: All wiring in panelboards, control equipment, cabinets, etc., shall be neatly wrapped, taped, or laced into groups to provide a neat and orderly appearance in the equipment.

5. If the size and number of conductors in a conduit on the Drawings is not shown then it shall be assumed to be 3 No. 12 wires in a 3/4-inch conduit.

6. Unless specified otherwise herein or shown otherwise on the Drawings, all wiring shall be installed in conduit.

7. All wires connected to terminal boards, terminal blocks, or to other similar terminals shall terminate by means of pressure terminals. Where terminal boards, terminal blocks, etc. are designed and manufactured to accept bare wire and have a pressure plate on each side of the wire, no pressure terminals on the wire will be required. Where the wire would have to encircle the holding screw to make a proper connection, the wire terminals are required.

8. Where the wire is shown larger than that required for the load, it is done so for voltage drop or other purposes and must be installed as shown. Where the wire is stranded, the removal of strands in order to install the wire into a lug provided on any equipment will not be permitted. A larger lug shall be installed which will accept the wire size indicated.

B. Instrument Cable

1. General

a. All signal lines shall be constructed of individually twisted pairs (6 to 10 twists per foot), including thermocouple extension leads. Cables shall be made of twisted pairs, with all lays and pairs twisted in the same direction for maximum flexibility.

b. Wire size is #16 AWG minimum for single pair runs under 5,000 feet in length. Wire size shall be #16 AWG for multi-pair cable runs under 5,000 feet in length.

c. Stranded tinned copper conductor shall be used for all wiring other than thermocouple extension leads.

d. Insulation resistance at 68°F between conductors and between conductors and ground shall be at least 500 megohms per 1,000 feet.

e. Multi-pair cable shall be jacketed with polyvinylchloride, polyethylene or teflon at least 0.045" thick. Voltage rating shall be 600 volts.

2. Signal Wiring

a. Low level analog (less than 500 millivolt dc). Use twisted pairs which may be cabled with other pairs carrying similar voltage levels. Foil wraps or equivalent shielding is required for each cable with the shield insulated from ground.

b. High level analog (greater than 500 millivolts dc). Use twisted pairs which may be cabled with other pairs carrying similar voltage levels and current levels less than 100 ma. Shielding is required.

c. Analog outputs (normally 0-4 V dc or 4-20 ma). Same as b.

d. Contact inputs/outputs, pulse outputs - use twisted pairs and run in separate conduit.

3. Signal and Shield Grounding

a. All shields must be grounded at one point only as close as possible to the signal source.

b. Thermocouples may be grounded or ungrounded.

c. Analog signals, should be grounded as near the signal source as possible.

d. Resistance bulbs should not be grounded.

4. Signal and Wiring Separation

a. High level analog signals may share the same conduit or run with contact or pulse signals.

b. Thermocouple and low level signals shall be run in a separate conduit.

c. A minimum separation of 12 inches between analog signal leads and a-c power leads should be maintained. For a-c power leads carrying 100 amps or greater, a 24 inch separation shall be maintained. Parallel runs should be limited to less than 500 feet. Perpendicular runs may be as close as 6 inches.

C. Conductor Identification:

1. Each wire shall be labeled at both termination points. Individual conductor or circuit identification shall be carried throughout, with circuit numbers or other identification clearly stamped on terminal boards and printed on directory cards in distribution cabinets and panelboards.

2. In all junction boxes, cabinets, control compartments and terminal boxes where no terminal board is provided, each wire, including all power wires, shall be properly identified by plastic coated, self-adhesive, wire marker.

3. In cases similar to the above where the terminal boards are provided for the control, indicating, and metering wires, all wires including motor leads and other power wires shall be identified by wire markers as specified above.

4. Equipment ground wire insulation shall be colored green or green with two or more yellow stripes.

5. In general and unless otherwise shown on the drawings, no two wires of the same color shall be run in the same conduit except such as control wiring, switch legs, neutral, and ground. Where a conduit run is shown on the drawings to have two or more wires connected to the same phase and, therefore, are the

same color, pressure sensitive, plastic marked wire marker identification tape shall be used wherever the wire is accessible (junction boxes, panels, device boxes, etc.). The numbers shall in each case, correspond to the circuit number and panelboard from which the circuit emanates. Control wiring inside any compartment which may be energized from a source outside the compartment shall have insulation. Where yellow insulated wires are used inside any cabinet, compartment, etc., a machine engraved, laminated plastic identification marker shall be installed on the outside of the compartment which reads:

CAUTION	5/8" letters
Wires inside may be energized from separate source	3/8" letters

Marker shall be white letters on a red background.

6. Insulation on ungrounded conductors larger than AWG #10 and on grounded (neutral) and grounding (equipment ground) conductors larger than AWG #6 may be black with color coding accomplished with the use of colored plastic tape. Tape shall be installed on the conductors wherever they are visible and shall be wrapped at least three (3) turns around the conductor.

7. All wiring on this project, except control wiring, shall reflect the phase relationship as follows:

277/480 volt system:	brown, orange and yellow for ungrounded conductors, gray with brown tracer for neutral conductors.
208/120 volt system:	black, red and blue for ungrounded conductors, white for neutral conductors.

- END OF SECTION -

SECTION 16121

WIRE CONNECTIONS AND CONNECTING DEVICES

PART 1 - GENERAL

1.01 REQUIREMENTS

Wire connection and connecting devices shall be as herein specified.

1.02 RELATED WORK

A. Section 16050 - General Electrical Provisions.

B. Section 16120 - Wire & Cable (Conductors).

C. Section 16950 - Electrical Field Acceptance Testing.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Connectors, Lugs, etc. "T & B," "Anderson," "Burndy," or equal.

B. Ties and Servings - "T & B," "Panduit," or equal.

C. Termination and splice connectors - "3M Scotchlok," "Anderson," "T & B," "Burndy," or equal.

2.02 MATERIALS – WIRE SPLICING AND TERMINATIONS (600 VOLTS AND BELOW)

A. Electrical Terminal and Splice Connectors (#12 - #4 AWG)

1. Terminals and splice connectors from #12 - #4 AWG shall be compression types with barrels to provide maximum conductor contact and tensile strength. Performance, construction, and materials shall be in conformance with UL standards for wire connectors and rated for 600 volts and 105 degrees Celsius.

2. Connectors shall be manufactured from high conductivity copper and entirely tin plated. Terminal barrels shall be separated on the inside surface and have a chamfered conductor entry. Terminals shall have funnel entry construction to prevent strand fold-back. All barrels shall be brazed seam or seamless construction.

3. Spade type terminals shall be sized for the appropriate stud and shall be locking type that snap firmly onto studs with a close fit for maximum retention. Spade type terminals shall be insulated with an insulation suitable for maintaining a high dielectric strength when crimped and be made from nylon, PVC, or equal.

B. Electrical Lugs and Connectors (#6 AWG - #1000 KCM): Lugs and splice connectors from #6 AWG - 1000 KCM shall be compression types with barrels to provide maximum conductor contact and tensile strength. They shall be manufactured from high conductivity copper and entirely tin plated. They shall be crimped with standard industry tooling. The lugs and connectors must have a current carrying capacity equal to the conductors for which they are rated and must also meet all UL

requirements. All lugs above 4/0 AWG shall be 2 hole lugs with NEMA spacing. The lugs shall be rated for operation through 35 KV. The lugs shall be of closed end construction to exclude moisture migration into the cable conductor.

C. Twist-on Wire Connectors (#12 AWG - #10 AWG)

1. All twist-on wire connectors must have a corrosion resistant spring that is free to expand within a steel jacket. The steel jacket must be insulated with a flexible vinyl jacket capable of withstanding 105 degrees Celsius ambient temperatures and of sufficient length to cover wires that are inadvertently overstripped.

2. Each connector size must be listed by UL for the intended purpose and color coded to assure that the proper size is used on the wire combinations to be spliced. The connectors must be compatible with all common rubber and thermoplastic wire insulations.

D. Solderless/Re-usable Lugs: Solderless/re-usable lugs shall be used only when furnished with equipment such as control panels, furnished by others, where specification of compression type lugs is beyond the CONTRACTOR'S control. In the event their use is necessary, the CONTRACTOR shall be responsible for assuring that they are manufactured to NEMA standards, with proper number and spacing of holes and set screws. Wires shall be coated with electrical joint compound, T & B Kopr-Shield, Penn-Union Coal-Aid, or equal before being bolted into the connector.

PART 3 - EXECUTION

3.01 INSTALLATION/APPLICATION/ERECTION

A. Insulation of Splices and Connections

1. Connections/splices with a smooth even contour shall be insulated with a conformable 7 mil thick vinyl plastic insulating tape which can be applied under all weather conditions and is designed to perform in a continuous temperature environment up to 105 degrees Celsius. The tape shall have excellent resistance to abrasion, moisture, alkalies, acids, corrosion, and varying weather conditions (including sunlight). The tape shall be equal to Scotch 33+ and shall be applied in conformance with manufacturer's recommendations. In addition, it shall be applied in successive half-lapped layers with sufficient tension to reduce its width to 5/8 of its original width. The last inch of the wrap shall not be stretched.

2. Connections/splices with irregular shapes or sharp edges protruding shall be first wrapped with 30 mil rubber tape to smooth the contour of the joint before being insulated with 33+ insulating tape specified in the previous paragraph. The rubber tape shall be high voltage (69 KV) corona-resistant based on self-fusing ethylene propylene rubber and be capable of operation at 130 degrees Celsius under emergency conditions. The tape must be capable of being applied in either the stretched or unstretched condition without any loss in either physical or electrical properties. The tape must not split, crack, slip, or flag when exposed to various environments. The tape must be compatible with all synthetic cable insulations. The tape must have a dissipation factor of less than 5 percent at 130 degrees Celsius, be non-vulcanizing, and have a shelf life of at least 5 years. The rubber tape shall be applied in successive, half-lapped wound layers and shall be highly elongated to eliminate voids. Other manufacturer's recommendations on installation shall be adhered to. The rubber tape shall be equal to Scotch 23 or 130C electrical splicing tape.

3. All splices made in exterior terminal boxes, manholes and handholes shall be made waterproof and shall be made with a splicing kit containing materials approved for making waterproof splices. Splice kits shall be as manufactured by 3M company and properly sized for the wire being spliced. For wire sized AWG #12 and smaller water proof splices shall be made using "Scotchlok" connectors in conjunction with 3M Co. #3570 sealing pack. For wire sized AWG #10 and larger waterproof splices shall be made using "Scotchlok" compression connectors in conjunction with 3M Co. type PST cold shrink waterproof insulators. Splices shall be made closely following the manufacturer's instructions.

B. Connection Make-Up

1. Connections of lugs to bus bars, etc., shall be made up with corrosion resistant steel bolts having non magnetic properties with matching nuts, and shall utilize a belleville spring washer (stainless steel) to maintain connection integrity. Connections shall be torqued to the proper limits. Prior to bolting up the connection, electrical joint compound shall be brushed on the contact faces of the electrical joint.

2. All motor lead connections (excluding motors over 200 horsepower) shall be made up using ring tongue compression lugs with proper size stainless steel nuts and bolts. Electrical joint compound shall be utilized and "Belleville" type spring washers shall be used to maintain tension on the connections. The connections shall then be insulated using the procedure described for irregular shapes, utilizing rubber tape in conjunction with vinyl electrical tape.

3. At the time of final inspection, the ENGINEER shall request the CONTRACTOR to disassemble 3 randomly selected motor lead connections in the ENGINEER'S presence, to assure conformance with these Specifications. The connections shall be reassembled by the Contractor.

4. The CONTRACTOR shall include all necessary tools, materials, and labor in his bid for disassembly of the connections and for remaking them with new insulating materials after inspection.

- END OF SECTION -

SECTION 16130

BOXES, CABINETS AND ENCLOSURES

PART 1 - GENERAL

1.01 WORK INCLUDED

This section of the Specifications shall include furnishing and installing all pull junction boxes, device boxes, cabinets and enclosures.

1.02 RELATED WORK

A. Section 16110 - Raceway.

B. Section 16190 - Supporting Devices.

C. Section 16450 - Grounding.

1.03 SUBMITTALS

A. Catalog data on junction, pull and device boxes.

B. Shop drawings on cabinets and enclosures.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

Junction/pull boxes - "Wiegmann," "Appleton," "Crouse-Hinds," "Hoffman," "Robroy Industries," "Cloud Concrete Products," "Spring City," "Carlon," "Sedco," or equal.

2.02 MATERIALS

A. Cabinets: All cabinets shall have inside dimensions as shown on the drawings or as required by the National Electrical Code where sizes are not shown on the drawings. They shall conform to the requirements of UL-50 and shall be labeled accordingly. Cabinets shall be of a gage as listed by Underwriters' Laboratories for panelboards, hot dipped galvanized sheet steel with welded and ground seams and finished with a rust inhibiting primer and baked medium gray (ASA 49) enamel finish. Doors shall be hinged and provided with a chrome plated flush lock, keyed the same as electrical panels. Where the size or general construction of the cabinet prohibits the use of flush lock, padlocking provisions shall be provided. Cabinets over 36 inches wide shall be furnished with double doors. The primary door shall have a three-point latching system and the secondary door shall have a two-point latching system. Doors shall provide the maximum possible size opening to the interior of the cabinet. Where used for telephone or signal system, and where shown on the drawings, a full size 3/4-inch thick marine grade plyboard painted black shall be provided rigidly attached to the back of the inside of the cabinet.

B. Junction and Pull Boxes: Junction and pull boxes in NEMA 1 interior locations and smaller than 100 cubic inches shall be galvanized steel of a gage as listed by Underwriters' Laboratories for panelboards. Junction and pull boxes in NEMA 1 interior locations with a volume of over 100 cubic inches shall be made of galvanized steel with welded and ground seams. Covers shall be galvanized steel and held in place by screws. Covers over 600 square inches shall be hinged on one side with hinges spaced a maximum of 18 inches and shall be held in place by screws.

C. Device Boxes (Outlet Boxes): Device boxes in NEMA 1 interior locations shall be standard galvanized steel 4 inches by 2-1/8 inches (nominal) for one device and proportionally larger for multiple devices. Device boxes for light fixtures shall be not less than 4 inches octagonal.

D. Cabinets, pullboxes and junction boxes in damp or wet locations shall be of the cast type, rust and corrosive resistant with threaded hubs and gasketed covers and shall conform to NEMA 4X construction. Device boxes in damp or wet locations shall be cast metal with a 40 mil PVC coating permanently fused on the exterior of the box and a red flexible urethane coating on the interior, FS or FD type with hubs. Sizes shall be as required by Article 370 of the National Electrical Code.

E. Pull Boxes: Pull boxes for exterior underground work are shown on the Contract Drawings and are the minimum number required. Others may be added at the CONTRACTOR'S option, but no extra pay shall be allowed. Interior pull-boxes are shown where necessary for clarity only and shall be used as needed.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Where specifically detailed or indicated on the Drawings, boxes shall be provided, installed and supported as shown. Where not specifically shown on the Drawings, the Specifications hereinafter shall apply. Boxes shall be provided in the wiring or raceway systems where shown on the drawings, wherever required for pulling of wires, making connections, and mounting of devices or fixtures. Each box shall be sized as shown on the Drawings or shall have the volume required by the National Electrical Code for the number of conductors enclosed in the box. Boxes installed for concealed wiring shall be provided with suitable extension rings or plaster covers, as required. Boxes and supports shall be fastened to wood with wood screws or screw-type nails of equal holding strength, with bolts and metal expansion shields on concrete or brick, with toggle bolts on hollow masonry units, and with machine screws or beam clamps on steel work. In overhead spaces, cast metal boxes threaded to raceways need not be separately supported except where used for fixture support. Sheet metal boxes shall be supported except where used for fixture support. Sheet metal boxes shall be supported directly from the building structure or by bar hangers. Where bar hangers are used, the bar shall be attached to raceways on opposite sides of the box and the raceway shall be supported with an approved type fastener not more than 24 inches from the box. Penetration of more than 1-1/2 inches into reinforced concrete joists shall avoid cutting any main reinforcing steel.

B. All openings in electrical equipment, enclosures, cabinets, outlet and junction boxes shall be by means of welded bosses, standard knockouts, or shall be sawed, drilled, or punched with tools specially made for the purpose. The use of a cutting torch is prohibited. Unused openings shall be plugged per the NEC.

- END OF SECTION -

SECTION 16140

WIRING DEVICES

PART 1 - GENERAL

1.01 WORK INCLUDED

This section of the Specifications shall include furnishing and installing of the following:

A. Toggle switches.

B. Receptacles.

C. Device plates.

D. Audible alarm signals.

1.02 RELATED WORK

A. Section 16050 - General Provisions.

B. Section 16130 - Boxes, Cabinets and Enclosures.

C. Section 16140 - Supporting Devices.

1.03 SUBMITTALS

Catalog data and samples on each type of wiring device.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

All standard use wiring devices and plates shall be of the same manufacturer. Manufacturers and catalog number listed below are given to establish type, quality and performance and in no way restrict the Contractor. Wiring devices by Pass and Seymour, Hubbell, Bryant, or equal will be acceptable.

2.02 MATERIALS

A. Receptacles:

1. NEMA 5-20R - 125 volts, 20 ampere, equal to Pass and Seymour "Spectrum 21", gray, back or side wired, Catalog No. 5362-Gry for duplex, Catalog No. CR-6300 for corrosion resistant and Catalog No. 5361-Gry for single receptacles.

2. Ground fault interrupting receptacles shall be required where shown on the Contract Drawings, and shall be indicated by the abbreviation "GFI" beside the circuit symbol on the Contract Drawings. They shall be rated 20 amps (125 volts) and shall be of the duplex, feed through type, capable of protecting all downstream receptacles on the same circuit. They shall be of UL listed and interrupt the current between 4-6 milliamps of ground fault leakage. Appropriate plates shall be furnished and installed.

B. Toggle Switches: Toggle switches shall be equal to Pass and Seymour "Spectrum 21", side and back wired rated a 20 amperes, 120-277 volts, high strength thermoplastic toggles, fast make, routine break contacts, grounding terminal. Switches shall be equal to Pass and Seymour Catalog Nos. as follows:

Single Pole -	20AC1- GRY
Three-Way -	20AC3- GRY

C. Device Plates:

1. Device plates used in exposed finished locations shall be brushed finish deluxe stainless steel (Type 302). Plates shall be one piece sized for the number of devices at the particular location in question. Sectional plates will not be accepted.

2. Device plates for use over devices in NEMA 4X sheet steel with a 40 mil PVC coating , and designed to fit the device and box. Where the device plate is for devices mounted in "FS" type boxes, they shall be gasketed type.

3. Weatherproof covers shall be equal to Pass and Seymour, Stainless Steel, Catalog Number WP-8 for vertically mounted receptacles or WPH-8 for horizontally mounted receptacles and WP-1 for toggle switches.

4. Weatherproof covers for GFI type receptacles mounted on the exterior of the building shall be equal to Pass and Seymour Catalog No. WP-26 for vertically mounted receptacles or WPH-26 for horizontally mounted receptacles.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Unless otherwise noted on the contract drawings or herein otherwise specified, all receptacles and other devices shall be recessed mounted into walls. The top of the outlet boxes for wiring devices, etc., shall be installed at the following heights above the finished floor or above finished grade:

Wall Switches	3'-4"
Convenience Outlets	1'-4"

General use convenience outlets shall be mounted VERTICALLY unless otherwise noted and where located in walls made of concrete masonry units (CMU), the outlet box shall be centered left-to-right in the masonry unit.

B. The location of outlets as shown on the drawings shall be considered approximate only. THIS CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR AND ALL OTHER SUB-CONTRACTORS AS TO THE LOCATION OF OUTLETS IN REFERENCE TO OTHER EQUIPMENT. Convenience outlets shall be relocated to miss other equipment if necessary (or relocated so as to be more convenient to equipment requiring cord-and-plug service). It shall be incumbent upon this Contractor to study the complete set of drawings with relation to spaces surrounding each outlet in order to coordinate his work with the work of others and in order that when his fixtures, outlets or other devices are installed, they will be symmetrically located and will not interfere with any other work or equipment. ANY CHANGE IN LAYOUT SHALL BE COORDINATED WITH THE ENGINEER BEFORE THE CHANGE IS MADE, and, if approved, shall be shown on the AS-BUILT drawings.

C. This Contractor shall cover all installed receptacles, switches, etc. prior to painting of the areas. NO DEVICE PLATE SHALL BE INSTALLED PRIOR TO THE FINISH PAINTING. ANY RECEPTACLE, SWITCH, DEVICE PLATE, ETC. FOUND WITH ANY PAINT ON IT AT THE TIME OF FINAL INSPECTION SHALL BE REMOVED AND REPLACED. THERE WILL BE NO EXCEPTIONS TO THIS REQUIREMENT. It shall be the responsibility of this Contractor to coordinate with the Painting Contractor with regard to the scheduling of the installation of switches, outlets, device plates, etc. and the painting of the areas involved.

- END OF SECTION -

SECTION 16190

SUPPORTING DEVICES

PART 1 - GENERAL

1.01 WORK INCLUDED

Electrical equipment shall be mounted, and installed using supporting devices as indicated on the Contract Drawings, as required by the work, and described herein.

1.02 RELATED WORK

A. Section 16050 - General Electrical Provisions.

B. Section 16130 - Boxes, Cabinets, Enclosures.

C. Section 16460 - Small Power and Miscellaneous Transformers.

D. Section 16480 - Motor Control Equipment.

E. Section 16500 - Lighting.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

"Kindorf," "Unistrut," or equal.

2.02 MATERIALS

All mounting brackets and strut shall be steel with a outer covering of 40 mil PVC or Type 304 stainless steel. Fasteners used to mount equipment shall be Type 304 stainless steel.

- END OF SECTION -

SECTION 16300

POWER DISTRIBUTION BY OTHERS

PART 1 - GENERAL

1.01 WORK INCLUDED

This section of the specification shall include the coordination of power distribution with the utility company.

PART 2 - PRODUCTS

None.

PART 3 - EXECUTION

3.01 COORDINATION

A. This Contractor shall contact the power company, negotiate the contract with the power company and arrange to have the work done in an orderly and timely manner. Complete coordination shall be made between the Contractor, power company, resident Engineer, plant operator, and the OWNER, keeping all informed of the plans and any other particulars concerning the work. Down-time shall be kept to a minimum.

B. The Contractor shall coordinate with the power company and provide any work contribution required by them to get the work completed such as trenching/backfilling, conduit, etc.

- END OF SECTION -

SECTION 16450

GROUNDING

PART 1 - GENERAL

1.01 WORK INCLUDED

This section covers the grounding system which includes ground rods, wire, connections and other miscellaneous items necessary to provide a fully grounded system.

1.02 RELATED WORK

A. Section 16050 - General Electrical Provisions.

B. Section 16110 - Raceway.

C. Section 16120 - Wire and Cable.

D. Section 16130 - Boxes, Cabinets, Enclosures.

E. Section 16435 - AC/DC Line Fluctuation Protection.

F. Section 16460 - Small Power & Miscellaneous Transformers.

G. Section 16500 - Lighting.

H Section 16950 - Electrical Field Acceptance Testing.

1.03 REFERENCES

All grounding conductors shall be sized in accordance with the latest edition of the National Electrical Code.

1.04 DEFINITION

A "good earth ground" shall be defined as a connection to the earth or to some conducting body which serves in place of the earth. A good earth ground shall be considered to be at zero potential.

1.05 GROUND RESISTANCE

The resistance value of the main grounding conductor measured between the motor control center and a good earth ground shall not exceed twenty five (25) ohms.

1.06 SUBMITTALS

Catalog data for ground rods, exothermic connections, and grounding clamps.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

Grounding equipment shall be Cadwell, ITT Blackburn, or equal.

2.02 MATERIALS

A. Ground Rods: Ground rods shall be the copper clad steel type and shall be a minimum of 10 feet in length, 3/4 inch in diameter. Ground rods shall be equal to those as manufactured by ITT Blackburn.

B. Grounding electrode conductors shall be bare stranded tinned copper. Equipment grounding conductor shall be copper, THW insulated, green (or green with yellow tracer) in color, and rated at 600 volts.

C. Ground clamps for use on copper or brass pipes shall be of copper, brass or silicon bronze.

D. Ground clamps for use on iron pipes shall be of galvanized or malleable iron, or of standard non-corrosive material.

E. Ground clamps for use on pipes shall have a rigid metal base providing good contact by proper seating on the pipe. Strap type clamps shall not be used.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Ground rods shall be driven vertically into the earth to at least one foot below finished grade. Where rock is encountered at a depth of less than four (4) feet, rods shall be buried in a trench at not less than two feet below finished grade.

B. Conductors main ground bars in motor control center to the earth shall be continuous without joints or splices. Connections to the grounding system at the motor control center shall be made with pressure connectors such as defined in Article 100, "Connector, Pressure (Solderless)", of the National Electrical Code.

C. Connections to ground rods and all other ground connections below grade shall have a MINIMUM mechanical contact surface area between the conductor and the ground rod of not less than three (3) square inches.

D. All connections made below finished grade shall be exothermic.

E. Installation of grounding conductors shall be such that they are not exposed to physical damage. All connections shall be firm and tight. Conductors and connectors shall be so arranged and provided so that there is no strain upon the connection. Buried equipment grounding conductors shall be buried at least 24 inches below finished grade and shall not be buried below concrete pads, paving, etc. except where running a tap to the grid or where shown on the contract drawings. Where buried below concrete or paving, grounding conductors shall be in rigid conduit unless shown on the drawings as a part of a grid.

F. Resistance measurements shall be made between the main grounding bar in the switchgear and a good earth ground. If this resistance is not equal to or less than the value given in paragraph 1.05 above, an additional grounding electrode system in the form of ground rods installed and connected together in a 10 foot by 10 foot grid shall be added. The rods shall be connected together and this grid connected to the system with AWG #3/0 bare tinned copper. The number of rods shall be as required to register the resistance value mentioned in paragraph 1.05 hereinbefore. Measurements shall be made in normally dry conditions and, in no case, less than 48 hours after rainfall.

G. Where a bare conductor is the only conductor installed in conduit or other raceway, and this conductor is serving as a grounding conductor, it shall be bonded to the raceway that contains it at each end of the raceway. The bond shall be made using a grounding type bushing and bonding jumper. The size of the jumper shall be the maximum size that the grounding bushing lug will accept and it shall be connected to the bushing with the lug and to the grounding conductor with a split bolt connector.

H. Cold water lines shall not be used as a grounding conductor, but a connection shall be made between the main grounding system conductor and the main incoming cold water supply line. The connection shall be made to the water line at its entrance to the building before any valving. The conductor used to make this connection shall be sized the same as the main grounding conductor and shall be run in rigid steel conduit from the point of connection to the grounding system to the water line. This conduit shall terminate near each connection in an insulated grounding type bushing. The conductor may be bare or insulated and shall be bonded to the conduit at each end as described above. A jumper conductor of AWG #3/0 bare tinned copper shall be installed around all metering and valving in the main water line. All other metal piping such as steam lines, chilled water lines, process lines, etc. shall be bonded to the grounding system as described above.

I. All metal electrical equipment cabinets (wireways, panels, device boxes, junction and pull boxes, motor control centers, etc.) shall be securely bonded to a grounding conductor running through any conduit terminating at the cabinet or enclosure by use of a grounding lug bushing and jumper wire to the enclosure wall. Panelboards and motor control equipment shall be provided with an equipment ground bus (including lugs or screw terminals) securely bonded to the enclosure. Junction boxes and other enclosures shall utilize an equipment ground bus or lug as required to securely bond the equipment grounding conductor to the enclosure. Where screw terminals or set screw lugs are used, sufficient lugs shall be provided such that not more than one conductor is installed into each lug or terminal.

J. No empty conduit shall serve as grounding conductor.

K. No flexible conduit shall serve as a grounding conductor.

L. All conduit shall contain a grounding conductor.

M. All main feeder circuits and all branch circuits shall contain a grounding conductor sized according to Table 250-95, Article 250 of the National Electrical Code or as shown on the drawings. This grounding conductor shall be connected to the main grounding conductor in the MCC from which the circuit emanates. Individual components of the system served by the main feeder circuit shall have their enclosures connected to the main feeder grounding conductor with pressure connectors.

N. The grounding conductor serving motor circuitry shall be connected inside the entrance compartment to the motor frame with a bolted solderless pressure connector. Bolts, nuts, washers and other assorted hardware shall be bronze, cadmium plated steel, or other corrosion resistant material. The motor ground connection shall be to the motor frame and independent of the mounting bolts or sliding base.

O. The neutral point of all transformer secondary windings of the system shall be connected to the grounding system. Transformer enclosures shall be grounded.

P. Where lightning arresters are furnished and installed either separately or with equipment and the grounding connections are not inherently provided, a suitable, separate, grounding conductor shall connect the lightning arrester with a separate ground rod. This rod shall be interconnected with any adjacent grounding system.

Q. Grounded and Grounding Conductor: Connections to the grounding conductor and/or the neutral (grounded) conductor shall be made in such a manner that removal of any device or equipment will not interrupt the continuity of these conductors to any device downstream from the device removed.

- END OF SECTION -

SECTION 16500

LIGHTING

PART 1 - GENERAL

1.01 WORK INCLUDED

This section specifies acceptable materials and methods of installation of all equipment to be used for the lighting system including lighting fixtures, poles, ballasts, photocells, lamps, etc.

1.02 CIRCUITING

The circuitry as shown on the drawings shall not be changed or grouped differently. If any circuitry must be changed, the change shall be made only after written approval by the resident Engineer and the change clearly shown on the record drawings.

1.03 RELATED WORK

A. Section 16050 - General Electrical Provisions.

B. Section 16110 - Raceway.

C. Section 16120 - Wire and Cable.

D. Section 16130 - Boxes, Cabinets and Enclosures.

E. Section 16190 - Supporting Devices.

F. Section 16450 - Grounding.

G. Section 16950 - Electrical Field Acceptance Testing.

1.04 SUBMITTALS

A. Shop drawings, catalog information, etc. for a complete description of each fixture type. Fixture letter designations shown on the drawings correspond to the type as specified in the schedule. Fixture manufacturers and catalog numbers are given to establish standards, quality of workmanship, and general appearance provided by the manufacturers. Lighting fixtures submitted for approval as a substitute will be CAREFULLY scrutinized to see that they meet the actual specifications herein and other qualities of the mentioned fixture and are, in the opinion of the resident Engineer equal in quality and appearance to the fixture specified. The Contractor shall be solely responsible for proof-of-equality of any fixture submitted for approval that is a substitution. Final determination of the acceptability of the fixture substituted for that specified will be made by the resident Engineer at the time of shop drawing submittal. No approval of any fixture will be given prior to bidding.

B. Shop drawings, wiring diagrams, etc. describing the photocell used in the control of the exterior lighting.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Lamps:

1. Fluorescent lamps shall be of the types and sizes required for the particular fixture into which they are to be installed. All fluorescent lamps shall be of one manufacturer such as General Electric, Westinghouse or Sylvania. Color Rating Index shall be a minimum of 80. All fluorescent lamps shall be T-8 type.

2. Incandescent lamps shall be of the sizes for the particular fixture as specified below. Incandescent lamps shall be rated at 130 volts and shall be so marked, unless otherwise specified herein below. "Rough Service" type lamps shall be provided where vibrations will cause a shortened life-span of standard lamps.

3. High pressure sodium lamps shall be General Electric "Lucalox".

B. Ballasts:

1. Fluorescent ballasts shall be solid state electronic ballasts designed to operate 32 watt T-8 fluorescent lamps. Ballasts shall be ETL/CBM rated with a Class A sound classification. Ballasts shall be high power factory type, thermally protected, automatic reset, less than 10% total harmonic distortion (TDH) and ac primary protected with a fast blowing fuse. Ballast temperature shall not exceed 90□C when in a 40□C ambient. Ballast shall carry Class P approval on the label to meet the requirements of Section 410-73 of the latest edition of the National Electric Code. One ballast shall operate two (2) lamps in a fixture. Ballasts shall have a frequency operation of 25 khz or greater and operate with less than 2% lamp flicker. Ballast shall withstand line transients as defined in ANSI/IEEE C62.41, Category A3. Input wattage to ballast and lamp combinations shall not exceed the following for 32 watt T-8 lamps: 2 lamp = 70 watts; 4 lamp = 1376 watts. Ballasts shall not contain polychlorinated biphenyls (PSC's). fixture ballasts shall be manufactured by Advance, Motorola, Universal or Magnetek.

2. Ballasts for high intensity discharge fixtures shall be designed to start and successfully operate the type of HID lamp required for the fixture. No lamp shall be installed into a fixture which has a ballast that has been manufactured to operate a different type of lamp. Ballasts shall be Underwriters' Laboratories listed.

C. Fusing: Fluorescent fixture ballasts shall each be protected against overload and short circuit by fuses equal to Bussman GLR or GMF fuses in HLR fuseholders. High intensity discharge type ballasts shall each be protected against overload and short circuit by fuses equal to Bussman Type KTK fuses in Type HEB fuseholders. Fuses shall be located approximately one (1) foot from the ballast except for pole mounted fixtures. Where pole mount fixtures are specified, the fusing shall be located just inside the hand hole (where applicable) or in a junction box at 18" above finished grade in the case of wooden poles.

D. Lighting Fixtures:

1. Fluorescent fixture housing, chassis and/or channels shall be not less than 20 gauge steel, of rigid construction, and, unless otherwise specified, shall have a finish equal to baked-on white enamel over a zinc phosphate undercoating. Reflectors shall be fabricated of not less than 22 gauge steel which shall have a

finish equal to baked-on white enamel. Reflectors shall have an INITIAL reflection factor of not less than 0.85.

2. Fluorescent lampholders shall be of such design that the lamp will be firmly in place, electrically and mechanically secure, and shall be located such that they permit easy insertion or removal of lamps. Lampholders shall be rigidly and securely fastened to the mounting surfaces with the necessary provisions to prevent the lampholders from turning. The dimensions of the lampholders shall be located to position the tube so that the reflectance pattern is such to give maximum lumen output from the fixture and also to provide the electrical properties necessary to successfully operate the lamp.

3. Wiring within the ballast compartments shall be secured to the chassis or housing with clips or other similar means. Wiring insulation within the compartments shall be rated for the heat produced by the ballasts and the lamp(s).

4. Ballast compartments and housings for high intensity discharge type fixtures shall be cast type of the size and shape necessary to contain transformers, capacitors, fuses, etc., necessary for the operation of the fixture. Lampholders shall be of the size and rating suitable for the particular fixture and shall be mounted such that the lamp is properly positioned within the reflector space.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Installation of lighting fixtures shall be in strict compliance with suggested and mandatory rules and regulations given in applicable articles of the latest edition of the National Electrical Code.

B. Fixtures shall be installed using normal workmanlike procedures and methods and making use of standard equipment available in the industry. Where doubt arises concerning the installation of a fixture or fixtures, the Contractor shall coordinate with the resident Engineer before installation begins. Weights, sizes, knockouts, mounting studs and holes shall be obtained from the manufacturer of the particular fixture involved before installation procedures begin. Generally installation shall follow specifications contained herein.

C. Some fixtures are to be mounted directly to the structure or to steel channel such as Unistrut or Kindorff channel which is, in turn, mounted to the structure. Mounting to the steel channel will be accomplished by use of fittings designed and manufactured for use with the particular steel channel being used.

- END OF SECTION -

SECTION 16950

ELECTRICAL FIELD ACCEPTANCE TESTS

PART 1 - GENERAL

1.01 WORK INCLUDED

After the electrical installation is complete, tests shall be made to demonstrate that the entire system is in proper working order and in accordance with the Drawings and Specifications. In no case shall the tests be less than those outlined hereafter unless requested in writing by the Contractor and permitted by the resident Engineer. The tests outlined herein shall be in addition to, and not substitution for, the tests of the individual items at the manufacturer's plant. Insulation and ground resistance tests shall be made before operating tests.

1.02 COSTS

The cost of the tests shall be borne by the Contractor, including expenses incident to retests occasioned by defects and failures of equipment to meet the Specifications.

1.03 DEFECTIVE EQUIPMENT

All wiring and equipment found defective, or failing to meet the specified requirements, shall be replaced by the Contractor without charge, unless written permission for repair is given by the resident Engineer.

1.04 REPORTS

The Contractor shall furnish four copies of all test results to the Engineer.

1.05 TEST UTILITIES

Unless otherwise specified, the Owner will supply the electric power, and other utilities necessary for the tests.

1.06 TEST INSTRUMENTS

The Contractor shall provide suitable electrical instruments including, voltmeter, ammeter, tachometer and megger. The Contractor shall furnish certified copies of the calibration curves of the instruments which shall have been calibrated for these specific tests.

1.07 TEST CIRCUITRY

The Contractor shall make the necessary openings in the circuits for the testing instruments and shall place and connect all instruments, equipment, and devices, necessary for the tests. Upon completion of the tests, the instruments and instrument connections shall be removed and all circuits shall be restored to their permanent condition by the Contractor.

1.08 RELATED WORK

Other sections of the Specifications require the services of one or more manufacturer's representatives, to ensure that equipment supplied has been installed properly and adjusted to proper working order. The Contractor shall advise the representatives of all applicable tests in this section, so that the work will be coordinated, and tests shall be combined where feasible.

PART 2 - PRODUCTS

None.

PART 3 - EXECUTION

3.01 OPERATING TESTS

A. Switches, Circuit Breakers, Control Devices: All switches, circuit breakers and control devices shall be operated to show correct and satisfactory operation.

B. Controls: Controls circuits shall be fully operated with the power circuits to the motors de-energized to assure proper sequence and operation before the system is energized.

3.02 MOTOR TESTS

A. Connections at motors, motor control centers, and transformers shall not be made up permanently until correct phase rotation of all the equipment has been determined. These connections shall be installed and insulated temporarily, if necessary, while determining proper rotation. Permanent connections shall be made after proper rotation has been established and subsequent to the completion of the insulation resistance and dielectric tests. Rotation of existing motors shall be determined to be the same as existing before permanent connections are made.

B. After installation, the Contractor shall megger the windings of all 3-phase motors. They shall be tested in accordance with, and meet the requirements of, IEEE Standard No. 43-1974, Recommended Practice for Testing Insulation Resistance of Rotating Machiner.

C. Each motor and its associated equipment shall be operated, as nearly as possible, under normal operating conditions for as long as reasonable and for a length of time sufficient to demonstrate correct alignment, temperature rise, speed, and satisfactory operation. The motors shall be loaded tc full capacity, or as near thereto as possible. Associated equipment includes instruments, meters, relays, circuit breakers, capacitors, switches, and other devices in motor control centers, panelboards, control and instrumentation panels, etc., related to the motor being tested. Motors (existing and new, 1/2 horsepower and larger) shall be tested for insulation resistance before conductors are connected thereto and again after they have gained running temperature.

3.03 INSULATION RESISTANCE TESTS

Each complete feeder and branch circuit of 600 volts or less, with everything but power supply and power-consuming equipment, connected thereto, shall be tested and shall have an insulation resistance between conductors, between each conductor and ground, and between each conductor and any metallic conduit enclosing of not less than 1,000,000 ohms unless otherwise accepted by the resident Engineer. The insulation resistance values shall be determined with all motor control centers, panelboards, fuseholders, switches, receptacles, and overcurrent devices in place. A megger having an output of at least 1000 volts shall be used to determine the insulation resistance value. Test data shall list each circuit and the measured resistance.

3.04 GROUND RESISTANCE TESTS

The Contractor shall test each entire grounding system for continuity of connections and for resistance. The ground resistance of conduits, equipment cases, and supporting frames shall not vary appreciably from that of the system as a whole and shall not exceed 25 ohms.

3.05 RELATED WORK

Where tests of any of the above-referenced equipment are included in other sections of the Specifications, the Contractor shall coordinate the testing to avoid duplication and conflict.

3.06 WITNESS

The resident Engineer shall be notified at least seven (7) calendar days in advance of each of the tests covered in this section of the Specifications so that he may arrange to witness the tests.

3.07 TEST RECORDS

Report: A record of all tests shall be delivered to the resident Engineer before final acceptance will be forthcoming.

- END OF SECTION -

DIVISION 17

TELEMETRY

SECTION 17000

INSTRUMENTATION AND CONTROL SYSTEM AND SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) – TELEMETRY SYSTEM

1.0 PART 1 - PROJECT DESCRIPTION

1.01. Description

A) Description of Work

The work to be accomplished under this section shall consist of furnishing the equipment necessary for a complete control system to function as specified herein and as shown on the drawings.

B) Scope of Work

The Contractor shall furnish and install all materials, labor, tools, equipment, supplies and services required to furnish and complete the reinstallation of the MTU and antenna from the existing office to the new office and insure the existing equipment after the move will interact with the existing telemetry system. This shall also include any path studies, conduit, electrical components, new tap, tubing and other appurtenances that are required to complete the signal from the relocated MTU located at the Sandy Hook Water District to all the RTU's within the system. The current SCADA system used by Sandy Hook Water District is a US Filter Honeywell system.

C) System Integrator Shall Supply:

1) Shop drawings prior to installation.
2) All the paper works and fees necessary to obtain a license in the name of the Owner.
3) All labor for installation and start-up of the system.
4) All equipment required by schedule.
5) All ancillary equipment, hardware, software, and appurtenances needed for proper installation and operation of equipment.
6) Provide spare parts and maintenance tools as described below.
7) Operations and maintenance manuals as detailed below.
8) 120VAC power at all sites.
9) Pressure sensing taps for all sensing points in the system.
10) Meter pits for sensing tank levels or line pressures in the system

D) Owner Shall Supply:

1) Access and easements as needed for all sites.

1.02. Quality Assurance

A) Manufacturer's Qualifications

The system specified herein shall be the product of a manufacturer who can demonstrate at least ten (10) years of satisfactory experience in furnishing and installing comparable radio telemetry/control systems for water and wastewater installations.

The manufacturer of this system shall maintain a 24-hour available inventory of all replaceable modules to assure the Owner of prompt maintenance service and a single source of responsibility. The manufacture and shall certify this to the Engineer in writing at the time of bidder pre-qualification.

B) Prebid Approval

All "unapproved" manufactures are required to submit a prebid submittal (14) days prior to the bid date. Submissions that fail to include a complete submittal as detailed shall be deemed unresponsive. The Consulting Engineer and the Owner shall be the sole judge as to whether the alternate equipment is considered an approved equal. Approval of an alternate system by the Engineer will not relieve the alternate system of strict adherence to these specifications. The prebid submittal shall include the following:

1) Block diagrams for the various sites in the proposed system,
2) Sample electrical drawings for typical sites
3) A product performance data sheet shall be included for each proposed component in the system (i.e. antennas, radios, coaxial cables & arrestors, remote unit equipment, central terminal unit equipment, power supplies, time delays and relays, and the various sensors required).
4) Radio path study for each radio path in the system.
5) An installation list with the names and phone numbers of both the Owner and Consulting Engineer for at least ten projects of similar size and complexity.
6) A "statement of compliance" detailing paragraph by paragraph his compliance or exceptions to these specifications.

Bidders shall satisfy themselves that the necessary radio frequency can be obtained. The radio path study provided by each bidder shall utilize either:

a) Computer generated techniques utilizing USGS terrain information to plot the path profiles for each radio path with elevation samples not more that 2000-foot increments.

b) Actual field measurements to determine the necessary antenna heights, transmitter power, and antenna gains required to insure a 20db fade margin as detailed in Section 2.02 of these specifications.

The a physical path analysis shall be made using temporary equipment installations and an IFR 1000 or equal equipment to measure actual path margins. The bidder shall include in his bid, all the calculations used to extrapolate the measured data. The bidder is expected to obtain the necessary temporary FCC license for the study.

C) Codes & Standards

The control system and its components shall comply will all applicable requirements of the following:

1) Electrical Code Compliance (National & Local)
2) NEMA Compliance
3) IEEE Compliance
4) EIA Compliance
5) FCC Compliance

D) System Integrator

The equipment shall be as supplied by Micro-Comm, Inc of Olathe, Kansas. This is the equipment now used by the district throughout their entire system.

1.03. Submittals:

Complete submittal shall be provided to the engineer for approval prior to equipment fabrication. The submittal data shall include the following:

A) Product Data

Provide product data sheets for each instrument and component supplied in the system. The data sheets shall show the component name as used on reference drawings, manufacturer's model number or other product designator, input and output characteristics, scale or ranges selected, electrical or mechanical requirements, and materials compatibility.

B) Shop Drawings

Provide drawings for each panel showing the wiring diagrams for control circuits and interconnections of all components. The drawings shall include wiring diagrams for all remote devices connected to the panel.

C) Panel Layout Drawings

A front panel and sub-panel layout shall be included as part of each control panel drawing. Components shall be clearly labeled on the drawing.

D) Installation Drawings

Typical installation drawings applicable to each site in the system shall be included.

1.04. Maintenance Information

A) Maintenance Data Manuals

Submit maintenance manuals and "as built" drawings on all items supplied with the system. The manuals and drawings are to be bound into one or more books as needed. In addition to "as built" engineering submittal data and drawings, the manual shall include:

1) Trouble Shooting Guides.
2) Maintenance and calibration data for all adjustable items.

1.05. Job Conditions

All instruments and equipment shall be designed to operate under the environmental conditions where they are to perform their service. The equipment shall be designed to handle lightning and transient voltages as normal environmental hazards. The environmental conditions are as follows:

A) Outdoor

The equipment will be exposed to direct sunlight, dust, rain, snow, ambient temperatures from -20 to +120 degrees F, relative humidity of 10 to 100 percent, and other natural outdoor conditions. The installations shall be hardened to with stand normal vandalism.

B) Indoor

The equipment will be capable of operating in ambient temperatures of +32 to +130 degrees F and relative humidity of 20 to 100 percent.

1.06. Delivery, Storage, & Handling

All items shall be stored in a dry sheltered place, not exposed to the outside elements, until ready for installation. All items shall be handled with appropriate care to avoid damage during transport and installation.

1.07. Sequencing & Scheduling

A) Coordination

The Systems Integrator shall coordinate with other electrical and mechanical work including wires/cables, raceways, electrical boxes and fittings, controls supplied by others, and existing controls, to properly interface installation and commissioning of the control system.

B) Sequence

Sequence installation and start-up work with other trades to minimize downtime and to minimize the possibility of damage and soiling during the remainder of the construction period.

PART 2 - PRODUCTS

1.08. Distributed Control Operation Description

A) General

The control system shall use "smart-programmable" Remote Terminal Units (RTUs) to provide a "distributed intelligence" type control system. The software programs used at all locations shall be stored in non-volatile EEPROM or Flash type memories that are field re-programmable using software detailed later in these specifications. The system shall be "self-initializing" and not require operator intervention after power interruptions, transients from lightning storms, or component changes. All units in the system shall include "watch-dog" circuitry to insure automatic restarts of the system. Each remote site in the system shall be assigned a unique digital address.

The control system shall support peer-to-peer (i.e. RTU to RTU) communications to provide completely automatic control. In the event a Central Unit is not in operation, the RTUs shall be capable of operation without software or hardware modifications. Each Water Tower remote shall be able to automatically communicate with its respective Booster Pump Station remotes with level data and discrete data. Each pump station remote shall be able to generate its own pump stop/start commands to maintain its water tower's level. All sites in the system shall have a "Telemetry Control" lamp to indicate that the site is functioning normally and in communication with the Central Unit or its respective water tower.

1.09. VHF (154-173 MHz) Radio Channel Data Operation

A) General

The control system shall be specifically designed for radio channel data communications. All of the equipment required for operation of the system shall be directly owned by the Owner and included as part of this contract. Systems using third party repeaters, trunking masters, or leased equipment will not be allowed.

B) Communications

The control system shall operate in a half-duplex mode over a single VHF (154 - 173MHz) radio frequency using "point-to-point" communication techniques. The RTUs shall monitor for the channel to avoid data collisions with other RTUs during peer-to-

peer communications. The system shall be capable of sharing the radio channel with other radio telemetry system. .

All data transmitted shall be in digital word form using FSK (frequency shift keying) transmission. All transmissions shall include the address of the sender and the receiver, and be subject to check sum, parity, and framing error checks, to insure a minimum data reliability of 1 error in 1,000,000,000 bits. Any transmissions that fail the data checking will be retried until correct. No data correction methods will be allowed. A plug-in RS232C data port shall be provided at all locations in the system to allow the use of a standard data terminal to view data exchanges between the sites and to provide a means of extensive de-bugging.

The system shall provide a complete data update at least once every (2) minutes with some functions updating faster as required by local system conditions.

C) Radio Channel Operation

The system shall be capable of operation on the narrow band splinter frequencies of the Private Land Mobile Radio Services within the Federal Communications Commissions (FCC) rules and regulations regarding these telemetry channels. The manufacture shall guarantee operation under co-channel conditions with other radio systems without interference to this system. FSK tones, data baud rates, transmitter output power, transmitter deviation, antenna gain, and antenna height shall be chosen to comply with the FCC requirements Part 90 - Subpart 90.35 and 90.238 for the Industrial/Business frequency pools. The radio system shall specifically meet the operating requirement that the sum of the highest FSK frequency and the amount of deviation shall not exceed 1.7 kHz for 3F2 emission (or 2.8 kHz for 6F2 emission) as detailed by the FCC for the specific frequency assigned.

The overall system design and operation shall provide a 20db pad over the minimum required for operation on all primary data paths (primary paths may include data relays) to insure a 98% reliability of communications. Remote sites required to support peer-to-peer back-up control shall provide 30db of pad to insure operation under all weather conditions and provide a 99.9% communications reliability. The 20db and 30db pad requirements and FCC rule compliance shall be demonstrated (at no additional cost) to the Engineer at his request. The testing shall be accomplished using an IFR AM/FM 1000S communications analyzer or equal equipment.

D) FCC Licensing

The system manufacturer/supplier shall be responsible for collecting all information, generating all paper work, and paying all fees required obtaining a license on behalf of the Owner.

1.010. Radio Transceivers & Accessories

A) General

The radio transceivers shall be standard "un-modified" mobile two-way that an be tuned, aligned, and repaired at any two-way radio shop. Interface to external data modems shall be through the front panel microphone jack. The radios shall be synthesized and fully field programmable and include a built-in time-out timer to disable the transmitter after 0-60seconds. The units shall be tuned to FCC specifications for the specific frequency assigned. The radio equipment shall be FCC type approved and the system capable of operation on the narrow band splinter frequencies (154 or 173MHz) in the Industrial/Business radio service.

The RTU shall be capable of being powered from AC, DC, or solar sources. DC and solar powered RTUs shall have an integral battery charging circuit that protects the external battery from over and under voltage conditions and provides automatic charging of the battery after power failures. The back-up power supply shall provide for the necessary 12VDC to run the radio and 24VDC to power external sensors while on battery power or recharging. Back-up batteries shall be rechargeable sealed lead-acid type batteries as manufactured by PowerSonic or equal. The back-up battery shall provide for 24 hours of back-up operation at water tower remote units and 3 hours at all other sites.

The RTU shall support multiple communications ports. The first shall be used primarily for CTU-RTU and RTU-RTU communications. It shall support baud rates of 110-9600 baud and have a plug-in standard 25 pin sub-D connector that provides both full RS232 interface and radio modem interface for use with either "data" radios or standard business band type radios (i.e. radios with out internal modems). This port shall also have a 9 pin sub-D connector to allow monitoring of the communications activity. The second communications port shall provide for multi-drop type communications with operator interfaces, external inputs and outputs (I/O), and programming terminals. The port shall provide for both 2 and 4 wire RS485 interface with data rates to 9600 baud. The communications ports shall include LED's to show the status of all control lines.

The RTU shall provide for sufficient installed and configured spare inputs and outputs (I/O) to meet the site requirements as detailed and provide for 25% spares of each type. The unit shall have a minimum of 8 discrete inputs (DI), (4) analog inputs (AI), and (1) high speed pulse input (PI). The analog and pulse inputs shall provide for sensor excitation with separate fuses for each input. The fuses may be the self-resetting type. The RTU inputs, outputs, and operator interface shall be as follows:

1) **Discrete Outputs** - The discrete outputs shall be isolated relay outputs rated at 5.0A continuous @ 240VAC. LEDs on the front of the RTU base unit or expansion module shall indicate the status of each output point. Interposing relays shall be provided if the voltage or current of the external load on a contact exceed the 5.0A 240VAC ratings. Each output shall be provided with operator settable software ON and OFF time delays

2) **Discrete Inputs** - The discrete inputs shall be optically isolated and provide for 24VDC excitation to remote sensors and switches. LEDs on the front of the input module shall indicate the status of each input point.

3) **Analog Inputs** - The analog inputs shall provide filtered and scalable analog to digital conversion of input signals. The analog inputs shall be switch selectable from 0-5VDC to 0-20mADC and provide a minimum of 0.3% resolution and 0.5% accuracy over the temperature range of 0-70degrees C. The RTU shall provide separately fused 24VDC excitations to the remote sensors.

4) **Analog Outputs** - The analog inputs shall provide a 0-5VDC signal to RTU pan mounted devices or 4-20mA isolated signals if sent to other panels as specified.

5) **Pulse Inputs** - The high-speed counter/pulse inputs shall provide for pulse ra to 1KHz direct from flow meter transmitter heads without interposing eq The pulse input shall include fused 12VDC excitation to the meter transmit

6) **Power Supply** - Each RTU assembly shall include an integral p Power supplies shall be designed for 12VDC or 24VDC input powe for use in battery back-up operations.

7) **Keypad & Display Unit** - The optional keypad & display unit shall have a 4x20 back-lighted LCD display to display the status of all local inputs and the tank level of the associated control water tower level. The 5x5 keypad shall provide for operator input of set points and timer settings. The operator interface shall be menu driven and provide for dedicated keys for cursor position and input functions. The operator interface shall provide for up to 50 screens of data display. The keypad & display unit shall be supplied and mounted on the front of the RTU enclosure if detailed in the specific RTU I/O requirement list. The keypad & display unit shall maintain the Nema 4 rating of the RTU enclosure.

3. Enclosures

The remote unit enclosures for indoor mounting shall meet all the requirements for NEMA Type 12 enclosures. The enclosures body shall be made of a minimum 14 gauge steel with continuously welded seems and be furnished with external mounting feet. The enclosure door shall be made of a minimum 16 gauge steel with have a 14 gauge steel hinge. Enclosures larger than 16x14 shall have a rolled lip on 3 sides of the door for added strength. The door opening shall have a rolled edge on 4 sides to protect the door gasket. The door gasket shall be heavy neoprene and attached to the door with oil resistant adhesive. Sub-panels shall be 14-gauge steel for 16x14 enclosures and 12 gauge for larger enclosures. The enclosure finish shall be gray polyester powder coating inside and out over phosphatized surfaces. The subpanels shall be finished in white. Nema 12 enclosures shall be Hoffman "CH" or "CONCEPT" wall mount enclosures.

Remote site installations requiring equipment to be mounted outside shall have a double box enclosure with the remote unit enclosure mounted inside a lockable NEMA 3R enclosure. The double enclosure shall be required to control vandalism, provide complete weather protection, reduce the heating effects of the sun, and prolong the life of the equipment. The NEMA 3R enclosure shall be constructed of 14 gauge galvanized steel, with a drip shield top and seems free sides front and back, and a stainless steel hinge pin. The enclosure finish shall be gray polyester powder coating inside and out over phosphatized surfaces. The NEMA 3R enclosure shall be Hoffman Bulletin A-3.

The remote unit enclosures mounted in damp corrosive areas (such as concrete meter vaults) shall be NEMA Type 4X rated enclosures. The enclosures shall be made of molded fiberglass polyester and be furnished with external mounting feet. The door shall have a seamless foam-in-place gasket and corrosion-resistant hinge pin and bails. Sub-panels shall be 14-gauge steel for 16x14 enclosures and 12 gauge for larger enclosures. The enclosure finish shall be a light gray inside and out. The subpanels shall be finished in white. Nema 4X enclosures shall be Hoffman "Fiberglass Hinged Cover".

4. Local Control Functions

In general the RTU shall be programmed to provide generic control functions as detailed earlier and to work in concert with the CTU. The integrator shall be responsible to meet with the owner and the engineer to develop the automatic control strategy required for the system.

3.0 PART 4 - EXECUTION

3.01. System Start-up

The manufacturer shall supply "Factory" personnel for start-up service as needed to insure satisfactory operation. Subsequent trips to the job site to correct defects shall be made at no charge to the Owner during the warranty period.

3.02. Training

The system manufacturer shall supply "factory" personnel to conduct an on-site training session; a minimum of one day of training is required.

3.03. Substantial Completion

The Engineer will grant substantial completion only after completion of the start-up and initial training phase of the project. The Engineer shall make an inspection of the system to determine the status of completion. Substantial completion will be awarded only when the system is providing usable service to the Owner. If the system is commissioned in phases, the Contractor may request substantial completion for the completed phases.

A) CTU Communications Method:

The CTU shall communicate with these RTUs via VHF radio communications as detailed previously.

B) Front Panel Display Requirements:

1)Keypad & Display assembly to display all inputs and output status
2)Pump #1 CALL lamp
3)Pump #2 CALL lamp
4)Telemetry Control Active lamp
5)Central Control Active lamp

C) Discrete Outputs:

1) (1) System Normal (displayed on front of RTU assembly)
2) Pump #1 CALL
3) Pump #2 CALL
4) (spare)

D) Discrete Inputs:

1) Power Failure
2) Pump #1 RUNNING
3) Pump #2 RUNNING
4) Low Suction Pressure (from existing pressure switch)
5) High Discharge Pressure (from existing pressure switch)
6) Un-authorized Entry (new door switch)
7) – 16) spares

E) Analog Inputs:

1) Discharge Pressure (new pressure transmitter)
2) Suction Pressure (new pressure transmitter)
3) (spare)

END OF SECTION