

PROJECT MANUAL  
FOR  
CITY OF LYNCHBURG

Elevator Replacement at Lynchburg City Armory

BID : 14-863

August 5, 2013



**PROCUREMENT DIVISION  
3RD FLOOR CITY HALL  
900 CHURCH STREET  
LYNCHBURG, VA 24504  
TELEPHONE (434) 455-3970  
FAX (434) 845-0711**

# Table of Contents

<u>Document</u>	<u>Page #</u>
<b>Bidding Requirements</b>	
Advertisement For Bids.....	2
Bid-Form .....	3
Escrow Account Election.....	5
Equal Opportunity Report Statement.....	6
Statement Of Experience.....	7
Statement Of Available Resources .....	8
Corporate Status Form.....	9
Questions To Bidders/Offerors .....	10
Construction Agreement .....	11
City Of Lynchburg, Virginia Standard Performance Bond .....	13
City Of Lynchburg Standard Labor And Material Payment Bond.....	15
Escrow Agreement .....	18
Instructions To Bidders .....	22
General Conditions.....	27
Specifications.....	85

## Attachments

### DRAWINGS:

TS	Title Sheet
D1.1	Demolition Plan & Notes
A1.1	Partial Floor Plans, Roof Plan, Elevations and Exterior Wall Assembly
A1.2	Base Bid Elevator Section
A1.3	Alternate No. 1 Elevator Section & Alternate No. 2 Elevator Section
A1.4	Stair Section, Handrail Section
S1	Structural
ME1	Mechanical & Electrical Plans
E1	Electrical Reference Drawings

## ADVERTISEMENT FOR BIDS

Sealed bids for the **Elevator Replacement at Lynchburg City Armory**, will be received by the City of Lynchburg, Procurement Division, City Hall, Lynchburg, VA, until **3:00 p.m., September 11, 2013**, and then publicly opened and read in the Bidder's Room, Third Floor, City Hall.

This project includes all labor, material, and equipment for an Elevator Replacement at the Lynchburg City Armory located at 1210 Church Street, Lynchburg, VA 24505.

The Project Manual and Drawings for this project may be viewed and downloaded from the City's website:  
<http://www.lynchburgva.gov/current-solicitations>

**An Optional pre-bid conference will be held at 11:00 A.m. on August 22, 2013** at the Lynchburg City Armory located at 1210 Church Street, Lynchburg, VA 24505.

Contact Lisa Moss at (434) 455-4228; fax: (434) 845-0711; email:[lisa.moss@lynchburgva.gov](mailto:lisa.moss@lynchburgva.gov) for further information. All requests for clarification or questions regarding this bid must be received no later than 2:00 p.m. on August 30, 2013.

**BID FORM**

Lisa Moss Procurement Division  
City of Lynchburg  
Third Floor, City Hall  
900 Church Street  
Lynchburg, Virginia 24504

Dear Ms. Moss:

The undersigned, as bidder, hereby declares that the only persons interested in this bid as principal, or principals, is or are named herein and that no person other than herein mentioned has any interest in this bid or in the Construction Agreement to be entered into; that this bid is made without connection with any other person, company, or parties making a bid; and that it is in all respects fair and in good faith, without collusion or fraud.

The undersigned, having visited and examined the site and having carefully studied all the Contract Documents, including without limitation, all drawings and specifications pertaining to "**Elevator Replacement at Lynchburg City Armory**" for the City of Lynchburg, Virginia, hereby proposes to furnish all labor, equipment, materials, and services and to perform all operations necessary to execute and complete the Work required for the project, in strict accordance with the Contract Documents together with Addenda numbered \_\_\_\_\_ through \_\_\_\_\_ issued during bidding period and hereby acknowledged, subject to the terms and conditions of the Construction Agreement for the lump sum amount of:

**TOTAL BASE BID:** \_\_\_\_\_ Dollars

(\$\_\_\_\_\_)

**SCHEDULE OF ALTERNATES:**

**A. Alternate No. 1:**

Over-excavate the footing to a depth of 3 feet and backfill with stone. The mat foundation will be placed on the control backfill. Refer to Drawing Sheet A1.3 for details.

Bid Alternate No. 1: \$\_\_\_\_\_.

**B. Alternate No. 2:**

Install helical pile foundations. The mat foundation will be placed on the piles. Refer to Drawing Sheet A1.3 for details.

Bid Alternate No. 2: \$\_\_\_\_\_.

\*There is no guarantee of award for the Alternative Bid Items. The Alternate Bid items will not be considered as part of the Total Base bid.\*

It is understood and agreed that the Owner, in protecting its best interests, reserves the right to reject any or all bids or waive any defects. Any changes, erasures, modifications, deletions in the bid form, or alternate proposals not specified in the Advertisement for Bids may make the bid irregular and subject to rejection.

The listed bid items are to contain all necessary costs required for completion of the Work in accordance with the Contract Documents.

If the Construction Agreement is for unit prices and not for a lump sum price, it is understood that all quantities listed on the following pages are estimated quantities, and the Owner reserves the right to raise, lower, or eliminate any quantity or item, and in any case, the unit prices shall be used in determining partial and final payment. It is further understood that costs to cover all components of the Work as described in the Contract Documents are included in this bid, even in cases where specific line items are not identified.

We are properly equipped to execute all work of the character and extent required by the Contract Documents, and we will enter into the Construction Agreement for the execution and completion of the Work in accordance with the Contract Documents; and we further agree that, if awarded the Construction Agreement, we will commence the Work on the date stated in the "Notice to Proceed" and will maintain a work force large enough to execute the Work and all obligations no later than the completion date stated in the Contract Documents.

Enclosed herewith is the following Security, offered as assurance that the undersigned will enter into the Construction Agreement for the execution and completion of the Work in accordance with the Contract Documents:

Bidder's Certified Check issued by \_\_\_\_\_ (name of bank) in the amount of:  
\$ \_\_\_\_\_ (5% of Base Bid amount)

Bidder's Bid Bond for 5% of Base Bid Amount Issued by \_\_\_\_\_  
(name of surety authorized to do business in Virginia).

The undersigned hereby agrees, if awarded the Construction Agreement, to execute and deliver to the City within ten (10) days after his receipt of the Notice of Award, a performance bond and a payment bond, in forms satisfactory to the City, from sureties authorized to do business in Virginia satisfactory to the City, in the amount of one hundred (100) percent of the Base Bid.

The undersigned further agrees that, in case of failure on his part to execute the said Construction Agreement within the ten (10) days after written notice being given on the award of the Construction Agreement or the failure to deliver the required performance and payment bonds within the ten (10) days, the monies payable by the Security accompanying this bid shall be paid to the City of Lynchburg, Virginia, as liquidated damages for such failure; otherwise the Security accompanying this Bid shall be returned to the undersigned.

Attached herewith are completed Statement of Experience and Statement of Resources forms which include the information requested.

The undersigned further certifies that this bid is not the result of, or affected by, any act of collusion with another person engaged in the same line of business, or any act punishable under the Virginia Governmental Frauds Act, or other law.

This bid remains valid and may not be withdrawn for a period of 60 days from this date.

CURRENT VIRGINIA CLASS A CONTRACTOR'S LICENSE/ REGISTRATION NO.: \_\_\_\_\_

Respectfully submitted,

\_\_\_\_\_  
CONTRACTOR

\_\_\_\_\_  
DATE

\_\_\_\_\_  
ADDRESS

BY: \_\_\_\_\_

\_\_\_\_\_  
ITS:  
(Title)

**ELECTION OF ESCROW ACCOUNT PROCEDURE FOR RETAINAGE**

If determined to be the successful low bidder(s), the above signed elects to use the Escrow Account Procedure for retainage.

\_\_\_\_\_

Write "Yes" or "No" on above line

If the successful bidder elects to use the Escrow Account Procedure for Retainage, the "Escrow Agreement" form shall be executed and submitted to the City of Lynchburg Engineering Division within fifteen (15) calendar days after notification. If the "Escrow Agreement" form is not submitted within the fifteen (15) day period, the Contractor shall forfeit his rights to the use of the Escrow Account Procedure.

Company\_\_\_\_\_

Authorized Signature\_\_\_\_\_



**STATEMENT OF EXPERIENCE**

Proposer: \_\_\_\_\_  
\_\_\_\_\_

How Long In Business: \_\_\_\_\_ At Current Address: \_\_\_\_\_

Principals: \_\_\_\_\_ Title: \_\_\_\_\_  
\_\_\_\_\_ Title: \_\_\_\_\_  
\_\_\_\_\_ Title: \_\_\_\_\_

Type of Work Normally Performed: \_\_\_\_\_  
\_\_\_\_\_

Projects of this type previously completed:

1. \_\_\_\_\_  
\_\_\_\_\_ Amount \$ \_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_ Amount \$ \_\_\_\_\_
3. \_\_\_\_\_  
\_\_\_\_\_ Amount \$ \_\_\_\_\_

Reference (for Projects listed above):

1. \_\_\_\_\_  
\_\_\_\_\_ Tel.No. \_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_ Tel.No. \_\_\_\_\_
3. \_\_\_\_\_  
\_\_\_\_\_ Tel No. \_\_\_\_\_

**STATEMENT OF AVAILABLE RESOURCES**

Equipment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Number of Personnel Currently Employed: \_\_\_\_\_

Number of Personnel Available for Project: \_\_\_\_\_

Other Pertinent Information: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**CORPORATE STATUS FORM**

**ALL PROSPECTIVE FIRMS MUST RESPOND TO THE FOLLOWING**

If a limited liability company, limited liability partnership or a limited partnership, indicate by checking one:      \_\_\_\_\_ Limited liability company

                                 \_\_\_\_\_ Limited liability partnership

                                 \_\_\_\_\_ Limited partnership

Have you registered with the Virginia State Corporation Commission, to conduct business in Virginia?

Yes     No

Name and address of organizer: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

List who is authorized to execute contracts:

\_\_\_\_\_

If conducting business under an assumed (fictitious) business name, fill out the following information:

Names of persons or entities owning business using assumed business name: \_\_\_\_\_

Owners' addresses: \_\_\_\_\_

Registration date: \_\_\_\_\_ Expires: \_\_\_\_\_

If conducting business as a sole proprietorship, general partnership, or joint venture, fill out the following information:

Names of all persons liable for obligations of the business: \_\_\_\_\_

Addresses of such persons: \_\_\_\_\_

**Questions to Bidders/Offerors**

Bidders/Offerors are to respond to the following question: Have any of the individual(s), owner(s), and/or principal officer(s) of the firm submitting the bid/proposal ever been convicted of (1) a felony, or (2) a misdemeanor involving moral turpitude?

YES \_\_\_\_\_

NO \_\_\_\_\_

If yes, list individual or officer and title and give details.

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NOTE: Answering yes to this question will not necessarily exclude your company from consideration but will be used to weigh the relationship between the offense and the contract to be performed.

Is your firm currently involved in litigation or a dispute involving arbitration?

YES \_\_\_\_\_

NO \_\_\_\_\_

If yes, for litigation list the litigation by case name, name of court, case number, and jurisdiction, and for arbitration, list the organization administering, if any, its contact information, any case number assigned, the arbitrators, and the location of the arbitration. For litigation and arbitration, briefly describe the claims and status, and give contact information for the opposing party or parties.

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## CONSTRUCTION AGREEMENT

This Construction Agreement (the "Contract") made and entered into on the \_\_\_\_ day of \_\_\_\_\_, 2013, by and between \_\_\_\_\_, party of the first part, hereinafter referred to as Contractor, and the City of Lynchburg, a municipal corporation of the Commonwealth of Virginia, party of the second part, hereinafter referred to as the Owner or City.

That the Contractor, for the consideration hereinafter fully set out, hereby agrees with the Owner as follows:

1. That the Contractor shall furnish all labor, materials, tools, and equipment and perform all Work required by the Contract Documents (as defined in the General Conditions hereto) for the Elevator Replacement at Lynchburg City Armory.

2. That the Contractor shall commence Work within ten (10) days after Notice to Contractor to Proceed with the Work under Contract ("Notice to Proceed"), and shall substantially complete the project within **120 calendar days**. Owner and Contractor recognize that time is of the essence of this Contract and that the Owner will suffer financial loss if the Work is not completed within the times specified in the Notice to Proceed, plus any extensions thereof. They also recognize the delays, expense and difficulties involved in providing the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for certain losses Owner is expected to suffer due to delay (but not as a penalty) Contractor shall pay **\$150.00** for each day that expires after the time specified for completion. If the Contractor is subject to liquidated damages, the City has the right, but not the obligation, to withhold the liquidated damages from the Contractor's regular payments or retainage. Rights and obligations relating to these liquidated damages are set out more fully in the General Conditions.

3. The Owner hereby agrees to pay the Contractor for the faithful performance of this Contract in accordance with the Contract Documents, subject to additions and deductions as provided in the Contract Documents, in lawful money of the United States, as follows:

\_\_\_\_\_Dollars  
(\$ \_\_\_\_\_)

4. The Owner shall make partial payment on a monthly basis to the Contractor in accordance with the Contract Documents on the basis of a duly certified and approved estimate of work performed during the preceding calendar month by the Contractor, less five percent (5%) of the amount of such estimate which may be retained by the Owner until all Work has been performed strictly in accordance with the Contract Documents and until such Work has been accepted by the Owner.

5. Within ninety (90) days after submission by the Contractor of evidence satisfactory to the Owner that all payrolls, material bills and other costs incurred by the Contractor in connection with the construction of the Work have been paid in full, satisfaction of all the requirements of the Contract Documents, and acceptance of such Work by the Owner, final payment on account of this Contract shall be made.

6. It is further mutually agreed between the parties hereto that if, at any time after the execution of this Contract, the performance bond provided for its faithful performance and the payment bond, the Owner shall deem the surety or sureties upon such bonds or either of them to be unsatisfactory, or if for any reason, such bonds cease to be adequate to cover the performance of the Work, the Contractor shall,

at his own sole expense, within five (5) days after the receipt of Notice from the Owner so to do, furnish an additional bond or bonds in such form and amount, and with such surety or sureties as shall be satisfactory to the Owner. In such event, no further payment to the Contractor shall be deemed to be due under this Contract until such new or additional security for the faithful performance of the Work shall be furnished in manner and form satisfactory to the Owner.

7. Contractor agrees to fulfill all requirements of state, Federal, and municipal laws which may be applicable to this project.

8. This Contract is subject to the General Conditions accompanying it, and all the documents defined by the General Conditions to be the Contract Documents are a part of this Contract.

This Contract is executed in two counterparts, each of which shall, without proof or accounting for the other counterparts, be deemed an original contract.

IN WITNESS WHEREOF, \_\_\_\_\_ has caused its name to be subscribed to this Contract by \_\_\_\_\_, its \_\_\_\_\_, and its corporate seal to be hereunto affixed and attested by \_\_\_\_\_, its \_\_\_\_\_, said officers being duly authorized therefore; and the City of Lynchburg has caused its name to be hereunto subscribed by L. Kimball Payne, City Manager, and its corporate seal to be hereunto affixed and attested by Valeria Chambers, its Clerk of Council, said officers being duly authorized therefore, all as to the day and year first above written.

CONTRACTOR

BY: \_\_\_\_\_

ITS: \_\_\_\_\_

(SEAL)

\_\_\_\_\_  
ATTEST:

CITY OF LYNCHBURG

BY: \_\_\_\_\_  
City Manager

(SEAL)

\_\_\_\_\_  
ATTEST:

\_\_\_\_\_  
Clerk of Council

**CITY OF LYNCHBURG, VIRGINIA  
STANDARD PERFORMANCE BOND**

KNOW ALL MEN BY THESE PRESENTS: That \_\_\_\_\_,  
\_\_\_\_\_, the Contractor ("Principal"), whose principal place  
of business is located at \_\_\_\_\_  
\_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_ ("Surety"), are held and firmly bound unto the City of Lynchburg, Virginia,  
the Owner ("Obligee"), in the amount of \_\_\_\_\_  
\_\_\_\_\_ Dollars  
( \$ \_\_\_\_\_ ) for the payment whereof Principal and Surety bind themselves, their heirs, executors,  
administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

Principal has, entered into a Construction Agreement with Obligee for certain work on a construction project known as Elevator Replacement at Lynchburg City Armory, which contract (the "Contract") is by reference expressly made a part hereof;

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if the Principal shall promptly and faithfully perform said Contract in strict conformity with the plans, specifications and conditions of the Contract and its Contract Documents, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Provided, that any alterations which may be made in the terms of the Contract, or in the Work to be done under it, or the giving by the Obligee of any extension of time for the performance of the Contract, or any other alterations, extensions or forbearance on the part of either or both of the Obligee or the Principal to the other shall not in any way release the Principal and the Surety, or either of them, their heirs, executors, administrators, successors or assigns, from their liability hereunder, notice to the Surety of any such alterations, extensions, or forbearance being hereby waived.

No action shall be brought on this bond unless brought within one year after: (a) completion of the Contract and all Work thereunder, including expiration of all warranties and guarantees, or (b) discovery of the defect or breach of warranty or guarantee if the action be for such.

The Surety represents to the Principal and to the Obligee that it is legally authorized to do business in the Commonwealth of Virginia.

Signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_, 2013.

(SEAL)

Contractor/Principal

By: \_\_\_\_\_

Witness: \_\_\_\_\_

Title: \_\_\_\_\_

(SEAL)

Surety

By: \_\_\_\_\_

Attorney -in-Fact

My Power of Attorney is recorded in the Clerks Office of the Circuit Court of \_\_\_\_\_, Virginia in Deed Book \_\_\_\_\_, Page \_\_\_\_\_, and has not been revoked.

\_\_\_\_\_  
Attorney-in-Fact

**AFFIDAVIT AND ACKNOWLEDGEMENT OF ATTORNEY-IN-FACT**

COMMONWEALTH OF VIRGINIA

(or, alternatively, Commonwealth or State of \_\_\_\_\_)

CITY/COUNTY OF \_\_\_\_\_ to wit:

I, the undersigned notary public, do certify that \_\_\_\_\_ personally appeared before me in the jurisdiction aforesaid and made oath that he is the attorney-in-fact of \_\_\_\_\_, the Surety, that he is duly authorized to execute on its behalf the aforesaid Bond(s) as its act and deed.

Given under my hand this \_\_\_\_\_ day of \_\_\_\_\_ 2013.

(SEAL)

\_\_\_\_\_  
Notary Public

My Commission expires: \_\_\_\_\_

APPROVED:

\_\_\_\_\_  
City Attorney/Designee

\_\_\_\_\_  
Date

**CITY OF LYNCHBURG  
STANDARD LABOR AND MATERIAL PAYMENT BOND**

KNOW ALL MEN BY THESE PRESENTS: That \_\_\_\_\_  
\_\_\_\_\_, the Contractor ("Principal") whose principal  
place of business is located at \_\_\_\_\_  
\_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_ ("Surety") are held and firmly bound unto the City of Lynchburg,  
Virginia, the Owner ("Obligee") in the amount of \_\_\_\_\_ Dollars  
( \$ \_\_\_\_\_ ) for the payment whereof Principal and Surety bind themselves, their heirs,  
executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

Principal has by written agreement dated \_\_\_\_\_ entered into a Construction Agreement  
with Obligee for Elevator Replacement at Lynchburg City Armory.

which contract (the "Contract") is by reference expressly made a part hereof;

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if the Principal shall promptly make payment to all claimants as hereinafter defined, for labor performed and material furnished in the prosecution of the Work provided for in the Contract and its Contract Documents, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions.

The Principal and Surety, jointly and severally, hereby agree with Obligee as follows:

1. A claimant is defined as one having a direct contract with the Principal or with a subcontractor of the Principal for labor, material, or both for use in the performance of the Contract. A "subcontractor" of the Principal, for the purposes of this bond only, includes not only those subcontractors having a direct contractual relationship with the Principal but also any other contractor who undertakes to participate in the Work which the Principal is to perform under the aforesaid Contract, whether there are one or more intervening subcontractors contractually positioned between it and the Principal (for example, a subcontractor). "Labor" and "material" shall include, but not be limited to, public utility services and reasonable rentals of equipment, but only for periods when the equipment rented is actually used at the Work site.
2. Subject to the provisions of paragraph 3, any claimant who has performed labor or furnished material in accordance with the Contract Documents in the prosecution of the Work provided in the Contract, who has not been paid in full therefore before the expiration of ninety (90) days after the day on which such claimant performed the last of such labor or furnished the last of such materials for which he claims payment, may bring an action on this bond to recover any amount

due him for such labor or material, and may prosecute such action to final judgment and have execution on the judgment. The Obligee need not be a party to such action and shall not be liable for the payment of any costs, fees or expenses of any such suit.

3. Any claimant who has a direct contractual relationship with any subcontractor of the Principal from whom the Principal has not required a subcontractor payment bond, but who has no contractual relationship, express or implied, with the Principal, may bring an action on this bond only if he has given written notice to the Principal within one hundred eighty (180) days from the day on which the claimant performed the last of the labor or furnished the last of the materials for which he claims payment, stating with substantial accuracy the amount claimed and the name of the person for whom the Work was performed or to whom the material was furnished. Notice to the Principal shall be served by registered or certified mail, postage prepaid, in an envelope addressed to the Principal at any place where his office is regularly maintained for the transaction of business. Claims for sums withheld as retainages with respect to labor performed or materials furnished shall not be subject to the time limitations stated in this paragraph 3.
4. No suit or action shall be commenced hereunder by any claimant.
  - a. Unless brought within one year after the day on which the person bringing such action last performed labor or last furnished or supplied materials, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof, the limitation embodied within this bond shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.
  - b. Other than in a Virginia court of competent jurisdiction, with venue as provided by statute, or in the United States District Court for the district in which the project, or any part thereof is situated.
5. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder.
6. This bond is intended to comply with the requirements and to afford all the benefits of a payment bond consistent with the requirements of Virginia Code § 2-2-4337 and § 2-2-4341. To the extent that those sections as they are in effect as of the date of issuance of this bond confer any requirements on Principal or Surety, or confer any additional benefits on any claimant (as the term "claimant" is used within either the meaning of those sections or this bond), those requirements and benefits shall be deemed to be incorporated into and be part of this bond.

Signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_.

(SEAL)

Contractor/ Principal

By: \_\_\_\_\_

Witness: \_\_\_\_\_

Title: \_\_\_\_\_

(SEAL)

Surety

By: \_\_\_\_\_

Attorney-in-Fact

Typed Name: \_\_\_\_\_

My Power of Attorney is recorded in the Clerks Office of the Circuit Court of \_\_\_\_\_ Virginia in Deed Book \_\_\_\_\_, Page \_\_\_\_\_, and has not been revoked.

\_\_\_\_\_  
Attorney-in-Fact

**AFFIDAVIT AND ACKNOWLEDGEMENT OF ATTORNEY-IN-FACT**

**COMMONWEALTH OF VIRGINIA**

(or, alternatively, Commonwealth or State of \_\_\_\_\_)

**CITY / COUNTY OF** \_\_\_\_\_

I, the undersigned notary public, do certify that \_\_\_\_\_ personally appeared before me in the jurisdiction aforesaid and made oath that he is the attorney-in-fact of \_\_\_\_\_, the Surety, that he is duly authorized to execute on its behalf the foregoing bond pursuant to the Power of Attorney noted above, and on behalf of said Surety, acknowledged the aforesaid bond(s) as its act and deed.

Given under my hand this \_\_\_\_\_ day of \_\_\_\_\_.

(SEAL)

\_\_\_\_\_  
Notary Public

My Commission expires: \_\_\_\_\_

APPROVED:

\_\_\_\_\_  
City Attorney/Designee Date

**ESCROW AGREEMENT**

THIS AGREEMENT ("Agreement"), made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2013 by,  
between and among the City of Lynchburg ("City"), \_\_\_\_\_ ("Contractor"), and

\_\_\_\_\_  
(Name of Bank)

\_\_\_\_\_  
(Address of Bank)

a trust company, bank, or savings and loan institution with its principal office located in the Commonwealth of Virginia (hereinafter referred to as "Bank" or "Escrow Agent"), and

\_\_\_\_\_  
("Surety") provides:

I.

The City and the Contractor have entered into the Construction Agreement ("Contract") with respect to City Project No. and Name: Elevator Replacement at Lynchburg City Armory ("the Contract"). This Agreement is pursuant to, but in no way amends or modifies, the Contract. Payments made hereunder or the release of funds from escrow shall not be deemed approval or acceptance by the City of performance by the Contractor or Surety.

II.

In order to assure full and satisfactory performance by the Contractor of its obligations under the Contract, the City may, pursuant to the Contract Documents, retain certain amounts otherwise due the Contractor. The Contractor has, with the approval of the City, elected to have these retained amounts held in escrow by the Bank. This Agreement sets forth the terms of the escrow. The Bank shall not be deemed a party to, bound by, or required to inquire into the terms of, the Contract or any other instrument or agreement between the City and the Contractor.

III.

The City may from time to time pursuant to this Agreement pay to the Bank amounts retained by the City under the Contract. Except as to amounts actually withdrawn from escrow by the City, the Contractor shall look solely to the Bank for payment of funds retained under the Contract and paid by the City to the Bank.

The risk of loss by diminution of the principal of any funds invested under the terms of this Agreement shall be solely upon the Contractor.

Funds and securities held by the Bank pursuant to this Agreement shall not be subject to levy, garnishment, attachment, lien, or other process whatsoever. Contractor agrees not to assign, pledge, discount, sell or otherwise transfer or dispose of his interest in the escrow account or any part thereof, except to the Surety.

IV.

Upon receipt of checks or warrants drawn by the City's Director of Finance and made payable to it as escrow agent, the Bank shall promptly notify the Contractor, negotiate the same and deposit or invest and reinvest the proceeds in "Approved Securities" within the meaning of this Agreement in accordance with the written instruction of the Contractor. In no event shall the Bank invest the escrowed funds in any security that is not an "Approved Security."

## V.

The following securities, and none other, are Approved Securities for all purposes of this Agreement:

- (1) United States Treasury Bonds, United States Treasury Notes, United States Treasury Certificates of Indebtedness or United States Treasury Bills,
- (2) Bonds, notes and other evidences of indebtedness unconditionally guaranteed as to the payment of principal and interest by the United States,
- (3) Bonds or notes of the City,
- (4) Bonds of any political subdivision of the City, if such bonds carried, at the time of purchase by the Bank or deposit by the Contractor, a Standard and Poor's or Moody's Investors Service rating of at least "A", and
- (5) Certificates of deposit issued by commercial Banks located within the Commonwealth, including, but not limited to, those insured by the Bank and its affiliates,
- (6) Any bonds, notes, or other evidences of indebtedness listed in Section (1) through (3) may be purchased pursuant to a repurchase agreement with a Bank, within or without the City, having a combined capital, surplus and undivided profit of not less than \$25,000,000 provided the obligation of the Bank to repurchase is within the time limitations established for investments as set forth herein. The repurchase agreement shall be considered a purchase of such securities even if title, and/or possession of such securities is not transferred to the Escrow Agent, so long as the repurchase obligation of the Bank is collateralized by the securities themselves, and the securities have on the date of the repurchase agreement a fair market value equal to at least 100 percent of the amount of the repurchase obligation of the Bank, and the securities are held by a third party, and segregated from other securities owned by the Bank.

No security is an Approved Security hereunder if it matures more than five years after the date of its purchase by the Bank or deposit by the Contractor.

## VI.

The Contractor may from time to time withdraw the whole or any portion of the escrowed funds by depositing with the Bank Approved Securities in an amount equal to, or in excess of, the amount so withdrawn. Any securities so deposited or withdrawn shall be valued at such time of deposit or withdrawal at the lower of par or market value, the latter as determined by the Bank. Any securities so deposited shall thereupon become a part of the escrowed fund.

Upon receipt of a direction signed by the City's Director of Public Works or the City Engineer, the Director of Finance or the City Accountant shall authorize the Bank to pay the principal of the fund, or any specified amount thereof, to the account of the City of Lynchburg. Such payment shall be made in cash as soon as is practicable after receipt of the direction.

Upon receipt of a direction signed by the City's Director of Public Works or the City Engineer, the Director of Finance or the City Accountant shall authorize the Bank to pay and deliver the principal of the fund, or any specified amount thereof, to the Contractor, in cash or in kind, as may be specified by the Contractor. Such payment and delivery shall be made as soon as is practicable after receipt of the direction.

VII.

For its services, hereunder the Bank shall be entitled to a reasonable fee in accordance with its published schedule of fees or as may be agreed upon by the Bank and the Contractor. Such fee and any other costs of administration of this Agreement shall be paid from the income earned upon the escrowed fund, and, if such income is not sufficient to pay the same, by the Contractor.

VIII.

The net income earned and received upon the principal of the escrowed fund shall first be paid or applied to pay the Bank's fee and any other costs of administration and such income shall be deemed a part of the principal of the fund. After all of the Bank's fees and other costs of administration have been paid from such income, the net income earned thereafter may then be paid over to Contractor in installments.

IX.

The Surety undertakes no obligation hereby but joins in this Agreement for the sole purpose of acknowledging that its obligations as surety for the Contractor's performance of the Contract are not affected hereby.

WITNESS the following signatures, all as of the day and year first above written.

CITY OF LYNCHBURG

CONTRACTOR: \_\_\_\_\_

BY: \_\_\_\_\_  
City Manager

BY: \_\_\_\_\_  
Officer, Partner, or Owner (Seal)

SURETY:

By: \_\_\_\_\_

Its: President (Seal)

ATTEST:

\_\_\_\_\_  
Secretary

By: \_\_\_\_\_  
Attorney-in-Fact

AFFIDAVIT AND ACKNOWLEDGEMENT OF ATTORNEY-IN-FACT

COMMONWEALTH OF VIRGINIA

(or, alternatively, Commonwealth or State of \_\_\_\_\_)

CITY / COUNTY OF \_\_\_\_\_

I, the undersigned notary public, do certify that \_\_\_\_\_ personally appeared before me in the jurisdiction aforesaid and made oath that he is the attorney-in-fact of \_\_\_\_\_, the Surety, that he is duly authorized to execute on its behalf the foregoing bond pursuant to the Power of Attorney noted above, and on behalf of said Surety, acknowledged the aforesaid bond(s) as its act and deed.

Given under my hand this \_\_\_\_\_ day of \_\_\_\_\_.

\_\_\_\_\_  
Notary Public (SEAL)

My Commission expires: \_\_\_\_\_

APPROVED:

\_\_\_\_\_  
City Attorney/Designee Date

## INSTRUCTIONS TO BIDDERS

### **DESCRIPTION OF WORK:**

The Work included under this Contract shall consist of all labor, materials, equipment, and the performance of all work necessary to complete the project known as "Elevator Replacement at Lynchburg City Armory," as described in the Contract Documents. This Work shall be performed in accordance with the Contract Documents.

Project consists of the removal of the existing elevator shaft and related equipment and systems located on the west side of the building, due to foundation settling issues. A new elevator shaft with new elevator equipment will be installed. The project includes concrete foundations, masonry walls, EPDM roofing, elevator equipment and miscellaneous mechanical and electrical work. The project also includes exterior sidewalk demolition and reconstruction.

**Note:** After the existing elevator shaft has been demolished, special inspections will be performed on the existing subgrade. If unacceptable conditions exist, changes to the design of the foundation may occur. Any modifications required to the foundation design shown in the Contract Documents will be executed through a change order process.

There has not been a recent asbestos survey completed by the City for this project. The City will be responsible for any asbestos abatement during the course of this project. If the awarded contractor locates any asbestos while working on this project, they are to cease work immediately and notify, the project manager, Scott Glass.

### **ACCEPTANCE AND GUARANTEE:**

At the completion of the project, a final inspection will be made by the Owner's Project Manager. The Contractor will be notified of the remaining work to be performed. When the work is satisfactorily completed, notification will be given that the project has been accepted. The guarantee period will be one (1) year from date of acceptance.

1. General: Subject to Owner's right to waive informalities, to be valid for consideration, bids must be completed and submitted in accordance with these instructions to bidders. All individual bid unit price items must be filled in, regardless of the quantity shown.
2. Plans and Specifications: Bidding documents will be provided as indicated in the Advertisement for Bids.
3. Qualification of Bidders: Each bidder must be prepared to submit within five calendar days of the Owner's request written evidence of his qualifications for the project, including, without limitation, financial data, previous experience, resources, personnel and evidence of authority to conduct business in the jurisdiction where the project is located.
4. Examination of Bid Documents and Site:
  - 4.1 Before submitting bids, each bidder must examine bid documents, including, without limitation, all the Contract Documents, thoroughly; familiarize himself with Federal, state and local laws, ordinances, rules, codes, and regulations affecting the Work; and correlate his observations with requirements of the bid documents.
  - 4.2 Bidders are requested and expected to visit the site of the project to alert themselves to local and special conditions which may be encountered during construction of the project such as: labor and transportation, handling and storage of materials, the availability of materials, and site access. Failure to make such investigations shall not relieve the successful bidder from performing and completing the Work in accordance with the Contract Documents.

- a. A pre-bid conference will be held at the time and place stated in the Advertisement for Bids.

5. Clarification:

- 5.1 No oral clarification of the bid documents will be made to any bidder. To be given consideration, requests for clarification must be received in time to allow preparation of a written response at least seven (7) days prior to date fixed for opening of bids. Clarifications will be issued in the form of written addenda to the bid documents and posted to the Procurement Website within five (5) days of the bid opening. Only clarifications by formal written addenda will be binding.
- (1) All communications in regard to clarifications and any other matters related to this project shall be addressed to: Lisa Moss, Procurement Division, 900 Church Street, Lynchburg, VA 24504, Fax: 434-845-0711, email: lisa.moss@lynchburgva.gov.

6. Substitutions:

- 6.1 Substitutions of material or equipment or both may be offered by the Contractor with his bid, provided that, if approved:
  - a. No major changes in the construction or design intent of the project would be required. Changes required to accommodate substituted items shall be made by the Contractor at no additional cost or time delay.
  - b. Features of quality, capacity, construction, performance, appearance, size, arrangement, and general utility, including economy of operation of substitutes offered, either parallel or exceed those of specified products.
  - c. The provisions of the General Conditions are met, and the provisions of the General Conditions any other guarantees, if required by the specification sections, shall apply in full force and effect to the performance of such substitute products, approved for incorporation into the Work.
- 6.2 Technical data covering the proposed substitution shall be furnished with the bid when possible, and not later than 10 days after bid submission.

7. Bid Submission:

- 7.1 Submit bids using forms furnished in the Project Manual and fill in all blank spaces on the form. Repeat notation "Contractor's Current Virginia License No. \_\_\_\_\_" on outside of inner envelope containing bid and bid security, and place this envelope within another envelope addressed to:

City of Lynchburg  
Procurement Division  
900 Church Street  
Third Floor, City Hall  
Lynchburg, VA 24504

Bidders shall include the following with their bid submission:

- Bid Form
- Statement of Experience
- Statement of Available Resources
- Equal Opportunity Report Statement
- Corporate Status Form
- Questions to Offeror Form
- Bid Bond or Cashiers Check Equivalent

- 7.2 Both the inner and outer envelopes shall have noted thereon:

- a. “Sealed Bid #
- b. The bidder’s name and address; and
- c. Repeat notation “Current Registered Virginia Contractor No. \_\_\_\_“ on the outside envelope.

7.3 Each bid must be accompanied by a cashier’s check payable to the City drawn on a bank satisfactory to the City, or a Bid Bond, in the amount of five percent (5%) of the amount of the total base bid, with the City as obligee, as assurance that the successful bidder will enter into the Contract within ten (10) days after Notice of Award.

If the successful bidder defaults by failure to enter into the Contract and to provide required performance and payment bonds, the certified check or Bid Bond accompanying the successful bid shall be collected by the City, not as a penalty but as liquidated damages for delays and such additional expenses as may be incurred by the City for reasons of such default.

7.4 Contractors will indicate a lump sum bid for on the bid form. The lump sum bid shall contain all necessary costs required for completion of the Work. Any changes, erasures, modifications, or deletions in the bid form, or alternate proposals not specified in the bid proposal may make the proposal irregular and subject to rejection.

7.5 Receipt deadline for bids will be as stated in the Advertisement for Bids.

7.6 Bids will be opened publicly in accordance with the Advertisement for Bids.

7.7 Withdrawal of bid after bid opening: To withdraw a bid after bid opening, a bidder must satisfy the substantive requirements of Va. Code §2.2-4330. In addition, the following procedures shall apply:

- a. The bidder shall give notice in writing of his claim of right to withdraw his bid within two business days after the conclusion of the bid opening procedure and shall submit original work papers with such notice.
- b. The mistake may be proved only from the original work papers, documents and materials used in preparation of the bid and delivered as required herein.

8. Bonds and Damages:

8.1 Bonds shall be with a surety company acceptable to the Owner- that is legally authorized to do business in Virginia and in a form acceptable to Owner.

8.2 A performance bond and a labor and material payment bond will be required in the amount of 100 percent of the bid.

8.3 Liquidated damages shall be as indicated in the Contract Documents.

9. Award of Contract:

9.1 The award of the Contract will be the responsible bidder submitting the lowest responsive base bid.

Selection of the apparently successful bidder's responsibility will include a serious evaluation of whether the bidder has conscientiously attempted to meet Minority and Disadvantaged Business Enterprise goals. A requirement of the Contract bidder will be that a genuine concerted effort will be utilized to meet the Contract goal.

9.2 Before the Contract is awarded, the bidder submitting the lowest responsive bid must satisfy the City that it has the requisite organization, capital, equipment, ability, resources, personnel, management, business integrity, and at least five years experience in the type municipal work for

which it has submitted a bid. Each bidder shall, with his bid, submit a list of at least five projects of similar size and dollar value completed within the last five years, giving location, dollar value, year completed, and the name(s) of the owner(s) and architect/engineers(s). The bidder shall verify to the City that it has the sufficient and qualified personnel to provide for the Contact Work. Failure by the lowest responsive bidder to sufficiently satisfy the City of its ability to meet any of the above requirements may serve as grounds for rejection of the bid.

- 9.3 The Owner reserves the right to cancel the Advertisement for Bids, reject any and all bids, waive any and all informalities, and disregard all conforming, nonconforming, conditional bids or counterproposals.
- 9.4 Unless canceled or rejected, a responsive bid from the lowest responsible bidder shall be accepted as submitted, except that if the responsive bid from the lowest responsible bidder exceeds available funds, pursuant to Section 18.1-9 of the Lynchburg Public Procurement Code, the Owner may negotiate with the apparent low bidder to obtain a contract price within available funds.
- a. Procedures for Negotiations: If the Owner wishes to negotiate with the apparent low bidder to obtain a contract price within available funds, negotiations shall be conducted in accordance with the following procedures:
1. If the using agency wishes to conduct negotiations pursuant to this section, it shall provide the procurement administrator with a written determination that the bid from lowest responsive, responsible bidder exceeds available funds. This determination shall be confirmed in writing by the director of finance or his designee. The using agency shall also provide the procurement administrator with suggested measures to bring the proposed purchase within budget through negotiations with the lowest responsive, responsible bidder, including reductions in scope, changes in quality, value engineering, changes in terms and conditions, or changes in schedule.
  2. The procurement administrator shall advise the lowest responsive, responsible bidder, in writing, that the proposed purchase exceeds available funds. He shall further invite proposed measures, such as a reduction in scope, change in quality, value engineering, changes in terms or conditions, or changes in schedule for the proposed purchase, and invite the lowest responsive, responsible bidder to amend its bid based upon the proposed measures to bring the purchase within available funds.
  3. Informal discussions between the City and the lowest responsive, responsible bidder, either in person, by e-mail, by telephone, or by other means, may be used to attempt to obtain a contract within available funds.
  4. Following any successful negotiations, the lowest responsive, responsible bidder shall submit a proposed addendum to its bid, which addendum shall include the specific changes in the proposed purchase, the reduction in price, and the new contract value. The addendum shall be reviewed by the purchasing agency, the City Manager, and City Attorney for acceptability.
  5. If an addendum is acceptable to the City, the City may award a contract within funds available to the lowest responsive, responsible bidder based upon the amended bid proposal.
  6. If the City and the lowest responsive, responsible bidder cannot negotiate a contract within available funds, all bids shall be rejected.
- 9.5 Protests of Award or Decisions to Award of Contract
- a. The following are the exclusive procedures for a bidder or offeror to protest the City's award or decision to award a contract.

1. Any protest to award a contract shall be in writing and shall be delivered so that it is received by the City Manager not later than five (5) business days after announcement of the award or decision to award, whichever comes first. Otherwise any such protest shall be deemed to be waived.
  2. Except for a protest of an emergency or sole source procurement, a protest of a City award or decision to award a contract may only be made by a person who submitted a bid or proposal for the procurement at issue and who was reasonably likely to have its bid or proposal accepted but for the City's decision. In the case of an emergency or sole source procurement, a protest may only be made by a person who can show that he was reasonably likely to have submitted a successful bid or proposal if the procurement had been other than emergency or sole source.
  3. Protests shall only be granted if (1) the protester has complied fully with Sec. 18.1-6 of the Lynchburg Public Procurement Code and there has been a violation of law, the Lynchburg Public Procurement Code, or mandatory terms of the solicitation that clearly prejudiced the protester in a material way, or (2) a statute requires voiding of the decision.
  4. The City Manager shall issue a written decision on a protest within ten (10) days of its receipt by the City Manager.
  5. If the protest is denied, the protester may only appeal the denial or otherwise contest or challenge the procurement by then filing suit in the Lynchburg Circuit Court, Lynchburg, Virginia, and serving the city with such suit within ten (10) days of such denial. Otherwise, the City Manager's decision shall be final and conclusive, and the protester's right to appeal the denial or to otherwise contest or challenge the procurement shall be deemed to be waived.
  6. Strictly following these procedures shall be a mandatory prerequisite for protest of the City's award or decision to award a contract. Failure by a bidder to follow these procedures strictly shall preclude that bidder's protest and be deemed to constitute a waiver of any protest.
- b. A protest may not be based upon the alleged non-responsibility of a person to whom the City awards or makes a decision to award a contract.
10. Bidders are referred to the General Conditions for the meanings of capitalized terms.

End of Instructions to Bidders

## **GENERAL CONDITIONS**

ARTICLE 1	CONTRACT DOCUMENTS AND DEFINITIONS
ARTICLE 2	ARCHITECT/ENGINEER
ARTICLE 3	OWNER
ARTICLE 4	CONTRACTOR
ARTICLE 5	SUBCONTRACTORS
ARTICLE 6	WORK BY OWNER OR BY SEPARATE CONTRACTORS
ARTICLE 7	MISCELLANEOUS PROVISIONS
ARTICLE 8	CONTRACT TIME
ARTICLE 9	PAYMENTS AND COMPLETION
ARTICLE 10	PROTECTION OF PERSONS AND PROPERTY
ARTICLE 11	INSURANCE FOR CONTRACTS
ARTICLE 12	CHANGES AND MODIFICATIONS IN THE WORK
ARTICLE 13	CLAIMS AND DISPUTE PROCEDURE
ARTICLE 14	UNCOVERING AND CORRECTION OF WORK
ARTICLE 15	TERMINATION OF THE CONTRACT

## GENERAL CONDITIONS

### ARTICLE 1 CONTRACT DOCUMENTS AND DEFINITIONS

#### 1.1 DEFINITIONS

##### 1.1.1 CONTRACT AND CONTRACT DOCUMENTS:

The Contract Documents include: (1) the Construction Agreement (the "Contract"), its General Conditions, its Special Conditions (if any) and its attachments (if any); (2) the City's Invitation for Bid No. 14-863 dated August 2013, and any addenda; (3) the Contractor's bid; (4) the Contract plans, drawings, and specifications and any addenda; and (5) any Modifications and any Field Orders. Any soils, geotechnical or other reports, surveys and analyses which may be made available to the Contractor for review or information under this Contract, are not adopted by reference into, nor are they part of the Contract Documents.

##### 1.1.2 MODIFICATION:

A Modification is (1) a written amendment to the Contract signed by both parties (Project Manager for City of Lynchburg and authorized agent for the Contractor), (2) a written Change Order signed by the Project Manager or Owner's authorized representative and an authorized agent for the Contractor, or (3) a written Change Directive signed by the Owner's authorized representative. Modifications may be made to the Contract and Contract Documents without notice to any surety for the performance or payment bonds for the Work. Any Modification that increases the Contract Sum by more than \$50,000 or that causes total expenditures for the Contract to exceed the amount budgeted for the Contract may only be made with the specific approval of the City Manager.

##### 1.1.3 WORK:

"Work" means the construction and services required by the Contract Documents and includes all services, plant, labor, materials, supplies, equipment and other things necessary for Contractor to carry out and complete the requirements of the Contract Documents. "Work" includes material suitably stored and protected. "Work" also includes any portion of the Work, whether completed or not.

##### 1.1.4 PROJECT:

The Project is the total construction of which the Work performed by Contractor under the Contract Documents may be the whole or a part.

##### 1.1.5 FURNISH, INSTALL & PROVIDE:

The terms "Furnish" or "Install" or "Provide", unless specifically limited in context, mean furnishing and incorporating a specified item, product or material into the Work, including all necessary labor, materials, equipment to make the item and the Work ready for use.

##### 1.1.6 EXTRA WORK:

The term "Extra Work" as used herein, refers to and includes work required by the Owner, which, in the judgment of the Owner involves changes in or additions to the Work required by the Contract Documents in their then-existing form.

##### 1.1.7 NOTICE OF AWARD:

"Notice of Award" is the written notice of the Owner's acceptance of the Contractor's bid given by the Owner to Contractor as the successful bidder.

##### 1.1.8 NOTICE:

"Notice" means written notice made in the manner specified in this paragraph.

1.1.8.1 "Notice" shall be deemed to have been given to the Owner if sent to the following persons by the means indicated in 1.1.8.3 and either such Notice actually was received by such persons or adequate proof of receipt is made:

Department of Public Works Buildings and Grounds	Procurement Division	City Attorney
800 Orchard Street Lynchburg, Virginia 24501	3 <sup>rd</sup> Floor, City Hall 900 Church Street Lynchburg, Virginia 24504	3rd Floor, City Hall 900 Church Street Lynchburg, Virginia 24504

1.1.8.2 "Notice" shall be deemed to have been given to the Contractor if sent to the following person by the means indicated in 1.1.8.3 and either such Notice was received by such person or the Contractor or adequate proof of receipt by such person or the Contractor is made:

(Insert Successful bidder authorized representatives name and address)

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1.1.8.3 "Notice" shall be sent by special courier, recognized overnight delivery service, or United States mail. With the exception of original bid documents, facsimile copies and e-mail shall be acceptable if the original is then sent by special courier, recognized overnight delivery service, or United States mail within three business days.

#### 1.1.9 CHANGE DIRECTIVES:

If the parties cannot agree to a written amendment to the Contract or to a Change Order, Owner may, by issuance of a written "Change Directive," direct Contractor to perform Work that Owner acknowledges, or that Contractor contends, to be a change to the Work required by the Contract Documents. A change order signed by the Owner that Contractor fails or refuses to sign shall be considered a "Change Directive."

#### 1.1.10 MISCELLANEOUS WORDS OR TERMS:

1.1.10.1 Whenever they refer to the Work or its performance, "directed", "required", "permitted", "ordered", "designated", "prescribed", and words of like import shall imply the direction, requirements, permission, order, designation or prescription of the Owner, and "approved", "acceptable", "satisfactory", "in the judgment of" and words of like import shall mean approved by or acceptable to or satisfactory to or in the judgment of the Owner.

1.1.10.2 The Contract Documents generally refer to the Owner, Contractor, Architect/Engineers, entities, and persons as if masculine in gender and singular in number. Such references are intended to include the feminine or neutral in gender and/or the plural in number when appropriate.

## 1.2 EXECUTION, CORRELATION AND INTENT OF CONTRACT DOCUMENTS

1.2.1 Two originals of the Contract shall be executed.

1.2.2 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work, including without limitation, all items reasonably inferable from the Contract Documents. The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all. Words and abbreviations which have well-known technical or trade meanings are used in the Contract Documents in accordance with such recognized meanings.

1.2.3 Anything shown on the 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. Technical specifications take priority over general specifications, and detail drawings take precedence over general drawings. Contractor shall promptly notify the A/E and Owner of

any conflict or inconsistency in the Contract Documents, upon its discovery, and promptly submit an explanation in writing of the conflict or inconsistency to the A/E, with a copy to the Owner. The A/E's decision thereon shall be final. In case of conflict or inconsistency between the drawings and the specifications, the specifications shall govern.

- 1.2.4 Should any labor, material, or equipment be required which is not denoted in the drawings and specifications, but which is, nevertheless, reasonably necessary for the proper carrying out of the intent of the Work, it is agreed that the labor, material, or equipment is implied, and the Contractor shall provide such labor and furnish such materials and equipment as fully as if they were completely delineated and prescribed, without additional cost to the Owner.
- 1.2.5 The Contractor may be furnished additional instructions and detail drawings to carry out the Work included in the Contract Documents. The additional drawings and instructions thus supplied to the Contractor will coordinate with the Contract Documents and will be so prepared that they can be reasonably interpreted as a part thereof. The Contractor shall carry out the Work in accordance with the additional detail drawings and instructions.
- 1.2.6 The drawings and specifications are divided into sections for convenience and clarity only. The Contractor shall not construe this division as a division of the Work into various subcontractor units. The Contractor may subcontract the Work in such divisions as he sees fit, but he is ultimately responsible for furnishing all Work required by the Contract Documents.
- 1.2.7 The provisions of this Contract cannot be amended, modified, varied or waived in any respect that causes a change to the Contract Sum or Contract Time except by a Modification. **The Contractor is hereby given notice that no person has authority to orally waive, or to release the Contractor from any of the Contractor's duties or obligations under or arising out of the Contract Documents.** Any waiver, approval or consent granted by Modification or Field Order to the Contractor shall be limited to those matters specifically and expressly stated thereby to be waived, approved or consented to and shall not relieve the Contractor of the obligation to obtain any future waiver, approval or consent.

### ***1.3 OWNERSHIP AND USE OF DOCUMENTS***

- 1.3.1 All plans, drawings, specifications, and documents relating to the Work are the property of the Owner and are to be used only for the Project.

## **ARTICLE 2 ARCHITECT/ENGINEER**

### ***2.1 DEFINITIONS***

- 2.1.1 The term Architect/Engineer, hereinafter "A/E" or "Architect" or "Engineer", shall mean the consulting firm or City Department/Division, or their duly authorized representatives, lawfully licensed to practice in Virginia, that is responsible for the activities specified herein.
- 2.1.2 Although the A/E is referred to throughout the Contract Documents as if singular in number and masculine in gender, A/E includes plural in number and feminine or neuter in gender, as appropriate.

### ***2.2 ARCHITECT/ENGINEER SERVICES***

- 2.2.1 The A/E will provide services as described in these General Conditions.
- 2.2.2 The A/E will advise and consult with the Owner. The Owner's instructions to the Contractor may be forwarded through the A/E. The A/E has authority to act on behalf of the Owner only to the extent

provided in the Contract Documents, and the A/E does not have authority to approve a change to the Contract Sum or the Contract Time.

- 2.2.3 The A/E may visit the site at intervals appropriate to the stage of construction to familiarize himself generally with the progress and quality of the Work and to determine in general if the Work is proceeding in accordance with the Contract Documents. Any visits or inspections by the A/E, any Owner's representative, or any consultant retained by the Owner are solely for the Owner's benefit and shall not confer any rights on Contractor or excuse Contractor from any obligation under the Contract Documents.
- 2.2.4 The A/E will immediately inform the Owner and Contractor whenever, in the reasonable opinion of the A/E, any of the Work is proceeding contrary to the requirements of the Contract Documents and will be unacceptable. Such notification by the A/E is solely for the benefit of the Owner and will not be a cause for the Contractor to claim either delay of the Work or any increase in the Contract Sum or Contract Time.
- 2.2.5 The A/E, the Owner and other governmental representatives shall at all times have access to the Project site and the Work regardless of its stage of progress. The Contractor shall provide facilities for such access so that the A/E, the Owner and other governmental representatives may perform their functions under the Contract Documents.
- 2.2.6 Where applicable, based on the A/E's observations and an evaluation of the Contractor's Applications for Payment, the A/E will recommend the amounts owing to the Contractor and will issue Certificates for Payment in such amounts, as provided in Article 99, Payments and Completion.
- 2.2.7 The A/E will be an interpreter of the requirements of the Contract Documents. The A/E will render interpretations necessary for the proper execution and progress of the Work, with reasonable promptness and in accordance with any time limit agreed upon. Either party to the Contract may make written request to the A/E for such interpretations. All interpretations of the A/E shall be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing and/or in the form of drawings.
- 2.2.8 The A/E will recommend to the Owner the rejection of Work that does not conform to the Contract Documents. Whenever, in his opinion, he considers it necessary or advisable for the implementation of the intent of the Contract Documents, he will have authority to require special inspection or testing of the Work in accordance with Subparagraph 7.6.2 whether or not such Work be then fabricated, installed or completed.
- 2.2.9 The A/E will review and approve or take other appropriate action upon Contractor's submittals such as Shop Drawings, Product Data, Samples and Manuals, but only for conformance with the design concept of the Work and with the information given in the plans, drawings, and specifications. Contractor shall ensure that all submittals are complete and have had included with them all correlated items that the A/E requires for his review. In the A/E's and Owner's sole discretion, the A/E may decline to review partial submittals or submittals for which correlated items have not been included. Contractor shall clearly note, both in a cover letter with any submittal and on the submittal itself, any deviation or inconsistency of anything submitted with the requirements of the Contract Documents. The A/E's approval of a specific item shall not indicate approval of an assembly of which the item is a component. The A/E's review and approval is for the sole benefit of the Owner and is not for the benefit of the Contractor. The A/E's review and approval shall in no way excuse Contractor from fully complying with the Contract Documents.
- 2.2.10 The A/E's acceptance of materials or products on behalf of the Owner shall not bar future rejection of such items (a) if they are subsequently found to be defective or inferior in quality or uniformity to the materials or products specified by the Contract Documents, (b) if such materials or products are not as

represented by the Contractor, or (c) if such materials or products do not conform to the requirements of the Contract Documents.

- 2.2.11 As required, the A/E will conduct inspections to assist the Owner in determining the dates of Substantial Completion and Final Completion, will receive and forward to the Owner for the Owner's review written warranties and related documents required by the Contract Documents and assembled and submitted by the Contractor, and will recommend a final Certificate for Payment upon Contractor's full compliance with the requirements of Article 9, Payment and Completion.
- 2.2.12 All claims, disputes, or other matters or questions between the Contractor and Owner arising out of or relating to the A/E's interpretation of the Contract Documents or arising out of any other decisions, communications, or actions of the A/E relating to the performance of the Work shall be resolved as set forth in Article 12, Changes and Modifications in the Work, and Article 13, Claims.
- 2.2.13 In case of the termination of the employment of the A/E, the Owner shall appoint a new A/E, who shall have the same status under the Contract Documents as the former A/E.

## **ARTICLE 3            OWNER**

### **3.1     *DEFINITION***

- 3.1.1 The Owner is the City of Lynchburg, Virginia ("City"). The term Owner means the Owner or its authorized representative. The Departmental Director, or his designee, is the authorized Owner's representative for this Contract. Notwithstanding the foregoing, the authority of the Owner's representative is subject to the limitations in the Lynchburg Public Procurement Code.
- 3.1.2 The Departmental Director, will designate a single Owner's representative, with the title of Project Manager (PM), who will have the power to act, within the scope of his delegated authority, for and on behalf of the Owner, in accordance with the terms of the Contract Documents.
- 3.1.3 For purposes of any change in the Work, the term "Owner" or "Owner's representative" specifically excludes any and all inspectors having building code or City ordinance responsibilities or jurisdiction under the requirements of the building permit for the Project.

### **3.2     *INFORMATION POSSESSED BY OWNER***

- 3.2.1 The Owner, as a courtesy, may make available for the Contractor's reasonable review, at the Owner's offices or together with the Contract Documents, certain boring logs, geotechnical, soils and other reports, surveys and analyses pertaining to the Project site. Any such information provided to the Contractor is intended to be for the Contractor's convenience only, and its accuracy and completeness are not guaranteed or warranted by the Owner or the A/E, it being the Contractor's sole responsibility to verify the accuracy and completeness of such information. Such information is not incorporated by reference into or made a part of the Contract Documents.
  - 3.2.1.1 Notwithstanding any information provided by Owner or anyone acting on the behalf of Owner, the Contractor assumes full responsibility for inspection of the site and for the means and methods of construction that he employs when performing the Work. The Owner shall not be liable for any additional work or costs arising as a result of any conclusions reached or assumptions derived by the Contractor from or based upon any such information that the Owner makes available for the Contractor's convenience.

### **3.3     *OWNER-PAID PERMITS AND FEES***

3.3.1 The Owner will, where applicable, pay for:

.1 Sewer availability fees;

.2 Water availability/meter connection fee;

.3 Electrical, natural gas, telephone, and cable TV permanent installation charges;

.4 Any easements required;

.5 Railroad flagging services; and

.6 Permits for work in Virginia Department of Transportation (VDOT) right-of-way. The Contractor is required to comply with the general requirement for work in the VDOT right-of-way as outlined in the The Manual of Specifications and Standard Details, 2005 for the City of Lynchburg, and the VDOT Manual for this work. Upon completion of all work in the VDOT right-of-way, the VDOT Personnel will conduct an inspection and issue a punch list. The Contractor shall be responsible for completion of those items on the punch list and for obtaining the written release of the permit.

3.3.2 The Contractor's attention is directed to Article 4.7, Contractor-Paid Taxes, Permits, Fees, and Notices, describing other permits to be obtained and fees to be paid by the Contractor.

### **3.4 OWNER'S RIGHT TO STOP WORK**

3.4.1 If the Contractor fails to correct defective Work as required herein or persistently fails to carry out the Work in accordance with the Contract Documents, the Owner, by a written order, may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the Owner to stop 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 person or entity.

### **3.5 OWNER'S RIGHT TO CARRY OUT THE WORK**

3.5.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within seven (7) days after receipt of Notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to any other remedy he may have, rectify such deficiencies, including without limitation, by performing the Work or having the Work performed by other contractors, as outlined in Section 6.1, Owner's Right to Perform Work and to Award Separate Contracts. In such case, an appropriate Change Order or Change Directive shall be issued by Owner deducting from the payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for the A/E's additional services made necessary by such default, neglect or failure. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

3.5.2 Neither the Owner nor the A/E nor their officers, agents, assigns or employees are in any way liable or accountable to the Contractor or his surety for the method by which Work performed by the Owner or performed by other contractors pursuant to this Article 3.5, or any portion thereof, is accomplished or for the price paid therefore. Notwithstanding the Owner's exercise of its rights under this Article 3.5, the Contractor and its surety shall have sole responsibility to maintain and protect the Work, including without limitation, that portion of the Work performed by or on behalf of Owner pursuant to this Article 3.5.

### **3.6 *SUSPENSION OF WORK***

- 3.6.1 The Owner shall have the authority to suspend the Work, in whole or in part, for such periods and such reasons as the Owner may deem necessary or desirable, in its sole discretion, including without limitation:
- .1 Unsuitable weather;
  - .2 Other conditions considered unfavorable for the suitable prosecution of the Work; and/or
  - .3 Other conditions considered adverse to the best interests of the Owner.
- 3.6.2 Any such suspension shall be made by Owner by written order to the Contractor. The Contractor shall obey immediately such order of the Owner and shall not resume the Work until so ordered in writing by the Owner. The Contractor shall be entitled to an extension of the Contract Time, subject to the provisions of Article 8, Contract Time, herein.
- 3.6.3 No such suspension of the Work shall be the basis of a claim by the Contractor for any increase in the Contract Sum or for any other damages, losses, costs or expenses if the suspension is for a reasonable time under the circumstances then existing and the cause thereof is beyond the control and is without the fault or negligence of the Owner or those acting on Owner's behalf.
- 3.6.4 In the event of suspension of Work, the Contractor will, and will cause his Subcontractors and others providing any of the Work through Contractor to, protect carefully his and their materials and Work against damage or injury from the weather and maintain completed and uncompleted portions of the Work as required by the Contract Documents. If, in the opinion of the Owner, any Work is damaged or injured by reason of failure on the part of the Contractor or any of his subcontractors to so protect same, such Work shall be removed and replaced at the expense of the Contractor.

### **3.7 *USE AND OCCUPANCY PRIOR TO FINAL ACCEPTANCE BY OWNER***

- 3.7.1 The Owner has the right to take possession of and use any completed or partially completed portions of the Work, notwithstanding that the time for completing the entire Work or any portions thereof may, or may not, have expired. The taking of possession and use by the Owner shall be in accordance with the provisions in Article 9.8, Substantial Completion and Guarantee Bond. If such prior use delays the Work, the Contractor may submit a request for a time extension in accordance with the requirements of Article 8, Contract Time.

### **3.8 *RIGHT TO AUDIT AND PRESERVATION OF RECORDS***

- 3.8.1 The Contractor shall maintain books, records and accounts that completely and accurately account for all of his costs and receipts relating to the Project in accordance with generally accepted accounting principles and practices. The Owner or its authorized representatives shall have the right to review, inspect, audit and/or copy the books, records, accounts and related documents, including without limitation, supporting documents, of the Contractor under any of the following conditions:
- .1 If the Contract is terminated for any reason in accordance with the provisions of these Contract Documents, in order to arrive at equitable termination costs;
  - .2 If the Contractor and the Owner dispute the amount due the Contractor under the terms of this Contract;
  - .3 To check or substantiate any amounts invoiced or paid that are required to reflect the costs of the Contractor, or the Contractor's efficiency or effectiveness under this Contract or in connection with

any extras, changes, claims, additions, backcharges, or other, as may be provided for in this Contract; and/or

.4 If it becomes necessary to determine the Owner's rights and the Contractor's obligations under the Contract or to ascertain facts relative to any Claim.

- 3.8.2 These provisions for review, inspection, audit and copying shall give the Owner unlimited access during normal working hours to the Contractor's books, records, accounts and supporting documents under the conditions stated above.
- 3.8.3 The Contractor shall make all his books, records, accounts, and all other documents relating to his costs and receipts under this Contract, including without limitation any supporting documents, available to the Owner and its representatives for review, audit, inspection and copying at any time during the period from entry into this Contract through three years after Final Payment or termination of this Contract, whichever occurs later.
- 3.8.4 Any payments made under this Contract shall not constitute a waiver of the Owner's rights to review, inspect, copy and audit. Payments shall not constitute a waiver or agreement by the Owner that it accepts as correct the billings, invoices or other charges upon which the payments are based. If the Owner's review and audit produces a claim against the Contractor, the Owner may pursue all its legal remedies, even though Owner has made all or part of the payments required by this Contract.
- 3.8.5 If any review or audit by the Owner or the Owner's representatives discloses an underpayment by the Owner, the Owner shall pay any amounts found by the audit to be owed to the Contractor. If such audit discloses an overpayment, the Contractor reimburse the Owner for the amount of the overpayment.
- 3.8.6 The Owner's right to review, inspect, audit and copy, and the Contractor's duty as to preservation of records shall terminate at the end of three (3) years after Final Payment or termination of this Contract, whichever occurs later. The Contractor shall include this "Right to Audit and Preservation of Records" clause in all his subcontracts, and he shall require the same to be inserted by all Subcontractors and lower-tier subcontractors in their subcontracts, for any portion of the Work. Should Contractor fail to cause this clause to be included in any such subcontract or lower tier subcontract or otherwise fail to ensure the Owner's rights under this Article 3.8, Contractor shall be liable to Owner for all costs, expenses and attorney's fees that Owner may incur in order to obtain the information that would have otherwise been available to Owner under this Article 3.8, and the absence of such information shall create a presumption in the Owner's favor, which Contractor must overcome with clear and convincing evidence, that the missing information does not support the payment to Contractor or Contractor claim at issue.
- 3.8.7 Review, inspection, audit and copying pursuant to this Article 3.8 may be conducted by the Owner or its authorized representatives.
- 3.8.8 Documents subject to this Article 3.8 shall be made available to Owner and its representatives in whatever formats Owner requests, including without limitation, any electronic formats and/or in paper formats.

### **3.9 RIGHT TO REVIEW OTHER DOCUMENTS AND MATERIALS**

- 3.9.1 In addition to the rights granted to the Owner under Article 3.8, Right to Audit and Preservation of Records or Documents, the Owner shall have the right to inspect, review and copy any and all of the Contractor's records or documents pertaining to or relating in any way to the Work, including, but not limited to, correspondence, memoranda, minutes, reports, intra- and inter-office communications, work papers, estimating sheets, progress reports, forecasts, audio or video recordings, computer disks, e-mails, films, or any other materials, regardless of physical form or characteristics, which were prepared by or in

the possession of, or obtainable by, the Contractor. The Contractor shall make all such documents and records available to the Owner upon ten (10) days Notice to the Contractor of the Owner's intent to inspect and review such documents. The Contractor shall include this "Right to Review Documents and Other Materials" clause in all its subcontracts, and Contractor shall cause the same to be inserted by all Subcontractors and lower-tier subcontractors in their subcontracts for any portion of the Work. The Contractor hereby waives any right he may have to additional compensation or time extensions in the event he fails or refuses to preserve and produce records pertaining to any such claim as requested by the Owner pursuant to this paragraph. In addition, the Owner may withhold all or any portion of any progress payments, which may be otherwise due, in the event Contractor refuses to comply with its obligations under this Article 3.9. The review, inspection and copying of documents and other records under this Article 3.9 may be conducted by the Owner or its authorized representatives.

- 3.9.2 Records and documents subject to this Article 3.9 shall be made available to Owner and its representatives in whatever formats Owner requests, including without limitation, any electronic formats and/or in paper formats.

## **ARTICLE 4            CONTRACTOR**

### **4.1     *DEFINITION***

- 4.1.1 The Contractor is the person or entity identified in the Contract as such, and is generally referred to throughout the Contract Documents as if singular in number and masculine in gender but includes the feminine and neuter in gender, as appropriate. The term Contractor means the Contractor or his authorized representative.
- 4.1.2 This entire Contract is not one of agency by the Contractor for Owner but one in which the Contractor is engaged independently in the business of providing the services and performing the Work herein described as an independent contractor.

### **4.2     *REVIEW OF CONTRACT DOCUMENTS***

- 4.2.1 The Contractor shall not perform any portion of the Work at any time without having obtained and carefully reviewed the Contract Documents or, where required, approved Shop Drawings, Product. Data, Samples or Manuals for such portion of the Work.
- 4.2.2 The Contractor shall keep at the Project site at least two (2) copies of the drawings and specifications and shall at all times give the A/E, inspectors, and representatives of the Owner access thereto. Further, said drawings and specifications shall be the approved sets issued to the Contractor by the appropriate City permit agencies

### **4.3     *CONTRACTOR'S REPRESENTATIONS***

By entering into this Contract with the Owner, the Contractor represents and warrants the following, together with all other representations and warranties in the Contract Documents

- 4.3.1 That he is experienced in and competent to perform the type of work required and to furnish the plant, materials, supplies or equipment to be so performed or furnished by him;
- 4.3.2 That he is financially solvent, able to pay his debts as they mature, and possessed of sufficient working capital to initiate and complete the Work required by the Contract Documents;
- 4.3.3 That he is familiar with all federal, state, and local government laws, ordinances, permits, regulations and resolutions that may in any way affect the Work or those employed therein;

- 4.3.4 That such temporary and permanent Work required by the Contract Documents which is to be done by him will be satisfactorily constructed and fit for use for its intended purpose and that such construction will not injure any person, or damage any property;
- 4.3.5 That he has carefully examined the Contract Documents and the site of the Project and the Work and that from his own investigations, he has satisfied himself and made himself familiar with: (1) the nature and location of the Work, (2) the character, quality and quantity of materials likely to be encountered, including, but not limited to, all structures and obstructions on or at the project site, both natural and man-made; (3) the character of equipment and other facilities needed for the performance of the Work, (4) the general and local conditions, including without limitation its climatic conditions, the availability and cost of labor and the availability and cost of materials, tools and equipment; (5) the quality and quantity of all materials, supplies, tools, equipment, labor and professional services necessary to complete the Work in the manner required by the Contract Documents; and (6) all other matters or things which could in any manner affect the performance of the Work;
- 4.3.6 That he will fully comply with all requirements of the Contract Documents;
- 4.3.7 That he will perform the Work consistent with good workmanship, sound business practice, and in the most expeditious and economical manner consistent with the best interests of the Owner;
- 4.3.8 That he will furnish efficient business administration, an experienced superintendent, and an adequate supply of workmen, equipment, tools and materials at all times;
- 4.3.9 That he will complete the Work within the Contract Time;
- 4.3.10 That his Contract Sum is based upon the labor, materials, systems and equipment required by the Contract Documents, without exception; and
- 4.3.11 That he has satisfied himself as to the feasibility and correctness of the Contract Documents for the construction of the Work.

#### **4.4 SUPERVISION AND CONSTRUCTION PROCEDURES**

- 4.4.1 The Contractor shall supervise and direct the Work, using his best skill and attention. He shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract; subject, however, to the Owner's right to reject means and methods proposed by the Contractor which are unsafe or otherwise not in compliance with the Contract Documents.
- 4.4.2 The Contractor shall be responsible to the Owner for the acts and omissions of Contractor's employees, Subcontractors and sub-subcontractors, suppliers, their agents and their employees, and of any other persons providing any of the Work through Contractor, and for their compliance with each and every requirement of the Contract Documents, in the same manner as if they were directly employed by the Contractor.
- 4.4.3 The Contractor understands and agrees that he shall not be relieved of his obligations to perform the Work in accordance with the Contract Documents either by the activities or duties of the Owner or the A/E in their administration of the Contract or by inspections, tests, or approvals required or performed under Article 7 by persons other than the Contractor.
- 4.4.4 Before starting a section of the Work, the Contractor shall carefully examine all preparatory work that has been executed by others to receive his Work to see that it has been completed. He shall check carefully,

by whatever means are required, to ensure that his Work and adjacent, related work will finish to proper quality, contours, planes, and levels.

- 4.4.5 The Contractor understands and agrees that the Owner and A/E will not have any liability for or any responsibility to exercise any control over construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, and they will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. The Owner and the A/E will not have any liability for or any responsibility to exercise any control over the acts or omissions of the Contractor, Subcontractors, sub-subcontractors or any of their agents or employees, or any other persons performing any of the Work.
- 4.4.6 The Contractor shall use no plant, equipment, materials, or persons for this Work to which the Owner objects.
- 4.4.7 The Contractor shall not remove any portion of the Work or stored materials from the site of the Project without the Owner's prior, written approval.

#### **4.5 LABOR, MATERIALS AND EQUIPMENT**

- 4.5.1 The Contractor shall furnish all plant, labor, materials, supplies, equipment and other facilities and things necessary or proper for, or incidental to, the Work, and will perform all other obligations imposed on him by the Contract Documents. Final payment will not be made until the Work is so completed.
- 4.5.2 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.
- 4.5.3 Work, materials, and equipment which are necessary in the construction but which are not specifically referred to in the specifications or shown in the drawings but implied by the Contract Documents shall be furnished by the Contractor at his own cost and expense. Such work and materials shall correspond with the general character of the Work as may be determined by the A/E subject to review as provided in Article 2.2.11.
- 4.5.4 The Contractor shall perform at least that percentage of the Work specified in the Contract to be Contractor self performed with forces that are in the direct employment of the Contractor. The Contractor shall submit to the Owner within thirty (30) days after award of the Contract a designation of the Work to be performed by the Contractor with his own forces. The percentage of the Work to be performed under subcontract shall be calculated by adding the amounts of all subcontracts and dividing this sum by the total Contract Sum.
- 4.5.5 The Contractor shall at all times enforce strict discipline, safety and good order among all persons providing any of the Work through him and shall not cause or allow to be used for the Work any unfit person or anyone not skilled in the task assigned to him. If any person providing any of the Work through the Contractor shall appear to the Owner to be incompetent or to act in a disorderly or improper manner, such person shall be removed immediately, at the request of the Owner, and shall not provide any of the Work except on written consent of the Owner.
- 4.5.6 No materials or supplies for the Work shall be purchased by the Contractor or by any Subcontractor subject to any chattel mortgage, or under a conditional sale or other agreement by which an interest is retained by the seller. The Contractor warrants that he has good title to all materials and supplies used by him in the Work.

- 4.5.7 The Contractor shall provide approved and adequate sanitary accommodations. All wastes shall be covered, disinfected, incinerated or otherwise disposed of legally.
- 4.5.8 All equipment, apparatus and/or devices of any kind to be incorporated into the Work that are shown or indicated on the drawings or called for in the specifications or required for the completion of the Work shall be entirely satisfactory to the Owner as regards operation, capacity and/or performance. No approval, either written or verbal, of any drawings, descriptive data or samples of such equipment, apparatus, and/or device shall relieve the Contractor of his responsibility to turn over the same in good working order for its intended purpose at the completion of the Work in complete accordance with the Contract Documents. Any equipment, apparatus and/or device not fulfilling these requirements shall be removed and replaced by Contractor with proper and acceptable equipment, apparatus, and/or device, or put in good working order satisfactory to the Owner by Contractor without additional cost to the Owner.

#### **4.6 WARRANTY**

- 4.6.1 The Contractor warrants to the Owner that all materials and equipment furnished under this Contract will be new unless otherwise specified, and that all workmanship will be of first class quality, free from faults and defects and in conformance with the Contract Documents and all other warranties and guaranties specified therein. Where no standard is specified for such workmanship or materials, they shall be the best of their respective kinds. All Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. If required by the Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. This warranty is not limited by the provisions of Article 13, Uncovering and Correction of Work.
- 4.6.2 The Work included in this Contract is specified in the Contract Documents. The Contractor shall be required to complete the Work specified and to provide all items needed for construction of the Work, complete and in good order.

#### **4.7 CONTRACTOR-PAID TAXES, PERMITS, FEES AND NOTICES**

- 4.7.1 The Contractor shall pay all sales, consumer, use and other similar taxes for the Work or portions thereof provided by the Contractor which are legally enacted at the time bids are received, whether or not yet effective. Taxes to be paid by the Contractor shall include, but shall not be limited to, the Lynchburg City Business, Professional and Occupational License Tax (a gross receipts tax).
- 4.7.2 Except as provided in Article 3.3, Owner-Paid Permits and Fees, the Contractor will be responsible for obtaining and paying for all other fees, permits and licenses necessary for the proper execution of the Work, including but not limited to:
- .1 Building Permit and inspections (City fees waived);
  - .2 Plumbing, Electrical, Mechanical Permits and inspections (City fees waived);
  - .3 Temporary water meter, temporary electrical and telephone installations and temporary utility usage;
  - .4 Temporary security lighting;
  - .5 All other permits necessary in order to perform the Work shall also be secured by the Contractor, and fees necessary in order to perform the Work shall be paid by him as part of this Contract at no additional cost to the Owner.

4.7.3 The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations, codes, permits, resolutions and lawful orders of any public authority bearing on the performance of the Work; including but not limited to OSHA, Title 40.1 Labor and Employment Chapter 3 of the Code of Virginia, and Title VII of the Civil Rights Act of 1964, as amended. All safety violations shall be corrected immediately upon receipt of notice of violation.

#### **4.8 COMPLIANCE**

4.8.1 All demolition and excavation shall comply with all laws, ordinances, rules and regulations, and lawful orders of public authority, including without limitation, those for the prevention of accidents as issued by the Department of Labor and Industry of the Commonwealth of Virginia.

4.8.2 To the extent of the Work indicated in the Contract Documents, the Contractor shall comply and the construction shall conform with all applicable and current editions or revisions of the following codes, specifications and standards. In case of conflict, the order of precedence shall be as hereinafter listed:

.1 Lynchburg Public Procurement Code;

.2 Contract Documents;

.3 The Virginia Uniform Statewide Building Code ("USBC"), as amended including, without limitation, The International Building Code ("IBC") and other codes incorporated by the USBC and IBC); and

.4 The Virginia Department of Transportation Road and Bridge Specifications and the Road Designs and Standards.

4.8.3 If the Contractor (or any person in a contract with the Contractor relating to the Work) finds an error, inconsistency, omission, ambiguity, discrepancy, conflict or variance in the Contract Documents, or between the Contract Documents and any provisions of law, ordinance, rule, or regulations or any of the codes, specifications and standards set forth in 4.8.2 herein, the Contractor has the obligation to promptly seek in writing a clarification thereof from the A/E, with a copy to the Owner, prior to the time of beginning any of the Work that is affected by such error, inconsistency, omission, ambiguity, discrepancy, conflict or variance. The Owner will welcome such a clarification request, and, if deemed necessary by the Owner, the Owner will issue a written instruction clarifying the matter in question. If the Contractor feels that the written clarification requires additional work, the Contractor shall follow the change process in Article 12, Changes and Modifications in the Work.

Should the Contractor fail to seek such a clarification thereof immediately upon the discovery of the need therefor, prior to the time the said Work is performed, the Contractor thereby assumes all risk of loss related to such error, inconsistency, ambiguity, discrepancy, conflict or variance which the Contractor (and any person in contract with Contractor relating to the Work) knew or should have known, using a normal, professional standard of care, existed prior to the time the Work was performed.

4.8.4 Any material or operation specified by reference to publications, or published specifications of a manufacturer, a society, an association, a code, or other published standard, shall comply with the requirements of the referenced document which is current on the date of receipt of bids. If the Contractor observes that any of the Contract Documents are at variance with any such referenced publications, codes, published specifications, or published standards in any respect, he shall promptly notify the A/E in writing, with a copy to the Owner. The A/E will make such judgments as are necessary and notify the Contractor prior to the performance of the Work.

- 4.8.5 If the Contractor performs any Work contrary to any law, code, ordinance, regulation, publication, standard, permit, rule, regulation or resolution, he shall assume full responsibility therefore and shall bear all costs attributable thereto.
- 4.8.6 The Contractor is responsible for locating all underground structures such as water, oil and gas mains, water and gas services, storm and sanitary sewers and telephone and electric conduits that may be encountered during construction. The Contractor shall have Miss Utility locate all utilities on the site within the area of the Work and shall dig test holes, to determine the position of the underground structures. The Contractor shall pay the cost of digging test holes and likewise he shall pay the cost of the services of the representatives of the owners of such utilities for locating the said utilities. The cost of determining the location of any and all utilities is to be included in the bid price. The Owner shall pay the owners of such utilities for fees or charges for relocation of gas, electric, telephone, cable or other lines and/or services indicated to be relocated by others.
- 4.8.7 If utilities are marked which are not shown on the plans, the Contractor shall immediately give Notice to the Owner and the A/E of such finding. The Owner and A/E shall provide a direction to the Contractor within a reasonable period of time if additional work is required as a result of the finding. If the Contractor believes that it requires additional work, the Contractor shall follow the change process in Article 12, Changes and Modifications in the Work.

#### **4.9 ALLOWANCES**

- 4.9.1 The Special Conditions, if any, will contain provisions for allowances, if applicable to this Contract.

#### **4.10 SUPERINTENDENT**

- 4.10.1 The Contractor shall employ and have present at the Project site a competent Superintendent and any necessary assistants to ensure adequate supervision of the Work. The Superintendent shall have full authority to represent the Contractor, and all communications given to the Superintendent shall be as binding as if given to the Contractor.
- 4.10.2 Such Superintendent shall be acceptable to the Owner and shall be one who will be continued in that capacity for duration of this Project, unless he ceases to be on the Contractor's payroll. The Superintendent shall not be employed on any other project during the performance of this Contract.

#### **4.11 CONSTRUCTION SCHEDULE**

- 4.11.1 The Contractor shall, within twenty (20) days after issuance of the Notice of Award, prepare and submit to the A/E and Owner for review, a reasonably practicable and feasible Construction Schedule, showing the method by which the Contractor will comply with Completion Date requirements as set forth in the Contract. Unless otherwise agreed in writing by Owner or indicated in the specifications, the Construction Schedule shall use the Critical Path Method ("CPM") and an industry-standard computer software program, such as Primavera, acceptable to Owner and A/E, and shall be provided in electronic and paper format. The Construction Schedule shall show in detail how the Contractor plans to execute and coordinate the Work. The Contractor shall use this schedule in the planning, scheduling, direction, coordination and execution of the Work. The Construction Schedule shall encompass all of the work of all trades necessary for construction of the Project and shall be sufficiently complete and comprehensive to enable progress to be monitored on a day-to-day basis. The Owner and A/E shall each be provided with a copy of all schedules, updates, reports and other documentation required herein, which shall be suitable for reproduction by the Owner, and, unless otherwise agreed by Owner, shall be in electronic and paper format. When required to assist the A/E with Project staffing requirements for the following week, the Contractor shall provide the A/E, on each Friday, with a detailed work schedule for the following week. The Contractor shall provide the A/E with at least a seventy-two (72) hour notice for the following

items: (1) All traffic lane changes, (2) Work ready for inspection or testing, (3) \_\_\_\_\_. The Contractor may be charged for additional costs of inspection when material and workmanship are found to not be ready for inspection or testing at the time the Contractor calls for inspection or testing.

- 4.11.2 It is the sole responsibility of the Contractor to prepare, maintain, update, revise and utilize the Construction Schedule as outlined in this Article 4.11, Construction Schedule. The Construction Schedule shall be the sole overall schedule utilized by the Contractor in managing this Project; provided, however, that Contractor may, at its option, employ and utilize other schedules based upon and consistent with the Construction Schedule. In general, it is the intent of this paragraph 4.11.2 to allow the Contractor to choose its own means, methods and construction procedures consistent with good practice and the Contract Documents.
- 4.11.3 If the Contractor should express an intention to complete the Work earlier than any required Milestone or Completion Date, including without limitation, in any schedule, the Owner shall not be liable to the Contractor for any delay or associated extra costs based upon the Contractor being unable to complete the Work before such earlier date. The duties, obligations and warranties of the Owner to the Contractor apply only to the completion of the Work on the Milestone and Completion Dates required by the Contract Documents and do not apply to early completion.
- 4.11.4 Submission to the Owner of the Construction Schedule is advisory only, does not satisfy any requirement for any notice required by the Contract Documents or the Lynchburg Public Procurement Code, and such submission shall not relieve the Contractor of the responsibility for accomplishing the Work within each and every required Milestone and Completion Date. Omissions and errors in the approved Construction Schedule shall not excuse performance that is not in compliance with the Contract Documents. Submission to the Owner and/or A/E in no way makes the Owner and/or A/E an insurer of the Construction Schedule's success or makes Owner and/or the A/E liable for time or cost overruns flowing from the Construction Schedule's shortcomings. The Owner hereby disclaims any obligation or liability by reason of Owner and/or A/E approval or failure to object to the Construction Schedule, and any such approval or failure to object shall not be considered an admission by the Owner that the Construction Schedule was reasonably practicable or feasible.
- 4.11.5 Contractor shall consult with and obtain information from principal Subcontractors necessary in preparation of the Construction Schedule, and for updates and revisions required therein. Contractor shall provide each principal Subcontractor with copies of the Construction Schedule and any revisions or updates affecting that Subcontractor's work. Contractor shall hold appropriate progress meetings with Subcontractors and shall direct and coordinate the work of Subcontractors consistent with and as required herein. Owner shall have the right to attend Subcontractor progress meetings but shall not be required to participate in such meetings or provide information to Subcontractors, except through the Contractor. Contractor shall keep up-to-date minutes of subcontractor progress meetings and shall provide same to Owner. The Contractor shall ensure that each Subcontractor, sub-subcontractor or supplier acknowledges and accepts the requirements of the Construction Schedule relating to their part of the Work.
- 4.11.6 If Contractor's Construction Schedule indicates that Owner, the A/E, or a separate contractor is to perform an activity by a specific date, or within a certain duration, Owner, the A/E, or any separate contractor shall not be bound to said date or duration unless Owner expressly and specifically agrees in writing to the same. The Owner's and/or A/E's overall review and acceptance or approval of the schedule does not constitute an agreement to specific dates or durations for activities of the Owner, A/E, or any separate contractor.
- 4.11.7 The Contractor's Superintendent shall maintain at the Project site a current, updated Construction Schedule, indicating actual monthly progress for those portions of the Project on which Work has been or is being performed.

- 4.11.8 If an extension or contraction of any Milestone or Completion Date is authorized by any Change Order, the Contractor shall revise his Construction Schedule, Milestone and Completion Dates accordingly.
- 4.11.9 If, in the opinion of the Owner, the Construction Schedule does not accurately reflect the actual progress and sequence of the Contractor's performance of the Work, the Contractor shall revise the Construction Schedule, upon the Owner's request, and submit a revised Construction Schedule that accurately represents the progress and sequence of the Contractor's performance of the Work.
- 4.11.10 Contractor shall submit to the Owner the name of any scheduling consultant that Contractor may select or retain, prior to using such consultant. Contractor shall not utilize any particular scheduling consultant over the reasonable objection of the Owner to that consultant.
- 4.11.11 Contractor covenants, warrants, and guarantees that Contractor will not:
- .1 Misrepresent to Owner its planning and scheduling of the Work;
  - .2 Utilize schedules materially different from those made available to the Owner or any subcontractors for the direction, execution and coordination of the Work, or which are not feasible or realistic;
  - .3 Prepare schedules, updates, revisions or reports that do not accurately reflect Contractor's actual intent or Contractor's reasonable and actual expectations as to:
    - (a) The sequences of activities,
    - (b) The duration of activities,
    - (c) The responsibility for activities,
    - (d) Resource availability,
    - (e) Labor availability or efficiency,
    - (f) Expected weather conditions,
    - (g) The value associated with the activity,
    - (h) The percentage complete of any activity,
    - (i) Completion of any item of work or activity,
    - (j) Project completion,
    - (k) Delays, slippages, or problems encountered or expected,
    - (l) Subcontractor requests for time extension, or delay claims of subcontractors, and
    - (m) If applicable, the float time available.
- 4.11.12 Contractor's failure to substantially comply with the foregoing covenants, warranties and guarantees of paragraph 4.11.11 shall be a substantial and material breach of contract which will permit Owner to terminate Contractor for default; or withhold payments under the Contract Documents; and shall entitle Owner to the damages afforded by these Contract Documents or applicable law.

- 4.11.13 Should Contractor fail to substantially comply with the provisions of the Contract Documents relating to scheduling and execution of the Work by the overall Construction Schedule, Owner shall have the right, at its option, to retain the services of scheduling consultants or experts (including attorneys if necessary in the opinion of the Owner) to prepare schedules, reports, updates and revisions of the schedule in accordance with the Contract Documents and to review and analyze same, in order to allow Owner and the A/E to evaluate the progress of the Work by Contractor, to determine whether Contractor is substantially complying with the Contract Documents, and to direct such action by the Contractor, as permitted by the Contract Documents, as required to ensure, under the Owner's schedule prepared hereunder, that Contractor will complete the Work within the Contract Time. All costs and expenses and fees incurred by Owner in exercising its rights hereunder shall be charged to Contractor's account. If Contractor fails to substantially comply with the scheduling and execution of the Work requirements of the Contract Documents, Contractor hereby agrees, in such instance, to comply with such Owner-prepared schedules, if any, or directions, activity sequences and durations as Owner may reasonably require, without additional cost to the Owner (subject only to cost adjustments for such changes in the Work as Owner may direct), to ensure completion within the Contract Time.
- 4.11.14 The Construction Schedule shall be utilized by Owner, A/E and Contractor for submission, review and approval of monthly Payment Requests. The schedule must be updated by Contractor monthly with each progress payment application and submitted to the Owner and A/E for review with the progress payment application. Owner shall not be required to process and review Contractor's Application for Payment if Contractor has failed or refused to provide the scheduling update information required herein.
- 4.11.15 The type of schedule to be utilized on this Project, along with its particular elements, shall be as specified in the Contract Documents.

#### **4.12 RESPONSIBILITY FOR COMPLETION**

4.12.1 The Contractor shall furnish such manpower, materials, facilities and equipment and shall work such hours, including night shifts, overtime operations and Sundays and holidays, as may be necessary to ensure the performance of the Work within the Milestone and Completion dates specified in the Contract. If the Owner notifies the Contractor that it has become apparent that the Work will not be completed within required Milestone or Completion Dates and such is not due solely to circumstances for which Contractor has established entitlement to an extension to the Contract Time, the Contractor agrees that it will assume full responsibility to take some or all of the following actions, at no additional cost to the Owner (except for circumstances beyond the Contractors' control), in order to ensure, in the opinion of the Owner, that the Contractor will comply with all Milestone and Completion Date requirements:

- .1 Increase manpower, materials, crafts, equipment and facilities;
- .2 Increase the number of working hours per shift, shifts per working day, working days per week, or any combination of the foregoing; and
- .3 Reschedule activities to achieve maximum practical concurrency of accomplishment of activities.

Failure of the Owner to notify the Contractor of the apparent delay shall not relieve Contractor of the obligation to finish the Work within the required Milestone or Completion date.

4.12.2 If the actions taken by the Contractor to remedy delays not due solely to circumstances for which Contractor has established entitlement to a time extension are not satisfactory, the Owner may direct the Contractor to take any and all actions necessary to ensure completion within the required Milestone and

Completion Dates, without additional cost to the Owner. In such event, the Contractor shall continue to assume responsibility for his performance and for completion within the required dates.

- 4.12.3 If, in the opinion of the Owner, the actions taken by the Contractor pursuant to this Article or the progress or sequence of Work are not accurately reflected on the Construction Schedule, the Contractor shall revise such schedule to accurately reflect the actual progress and sequence of Work.
- 4.12.4 Failure of the Contractor to substantially comply with the requirements of this Article is grounds for a determination by the Owner, pursuant to Article 15, Termination Of The Contract, that the Contractor is failing to prosecute the Work with such diligence as will ensure its completion within the time specified.
- 4.12.5 The Owner may, at its sole discretion and for any reason, including when it is apparent to the A/E or Owner that the Work will not be completed within the required Milestone or Completion Dates, require the Contractor to accelerate the Construction Schedule by providing overtime, Saturday, Sunday and/or holiday work and/or by having all or any subcontractors designated by the Owner provide overtime, Saturday, Sunday, and/or holiday work. If the Owner requires overtime, Saturday, Sunday or holiday work by the Contractor's or his Subcontractor's own forces, and such requirement is not related in any way to the Contractor's apparent inability to comply with Milestone and Completion Date requirements, the Owner shall reimburse the Contractor for the direct cost to the Contractor of the premium time for all labor utilized by the Contractor in such overtime, Saturday, Sunday or holiday work (but not for the straight time costs of such labor), together with any Social Security and State or Federal unemployment insurance taxes in connection with such premium time. However, no overhead supervision costs, commissions, profit or other costs and expenses shall be payable in connection therewith.
- 4.12.6 This provision does not eliminate the Contractor's responsibility to comply with the City's noise ordinances, all VDOT permit requirements, and all other applicable laws, regulations, rules, ordinances, resolutions, and permit requirements.

#### **4.13 DOCUMENTS AND SAMPLES AT THE SITE**

- 4.13.1 The Contractor shall, at the Owner's direction, maintain at the site for the Owner one record copy of all drawings, specifications, addenda, Change Orders and other Modifications, and Field Orders in good order and marked currently to record all changes made during construction, and approved Shop Drawings, Product Data, Samples and Manuals. These shall be available to the A/E. These shall be delivered to the Owner upon completion of the Work.

#### **4.14 SHOP DRAWINGS, PRODUCT DATA, SAMPLES AND MANUALS**

- 4.14.1 SHOP DRAWINGS are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or any Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.
- 4.14.2 PRODUCT DATA are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate a material, product or system for some portion of the Work.
- 4.14.3 SAMPLES are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.
- 4.14.4 MANUALS are manufacturer's installation, start-up, operating, maintenance and repair instructions, together with parts lists, pictures, sketches and diagrams that set forth the manufacturer's requirements, for the benefit of the Contractor and the Owner.

- 4.14.5 The Contractor shall review, approve and submit, with reasonable promptness and in such sequence as to cause no delay in the Work or in the work of the Owner or any separate contractor, all Shop Drawings, Product Data, Samples and Manuals required by the Contract Documents.
- 4.14.6 By approving and submitting Shop Drawings, Product Data, Samples and Manuals, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

Parts and details not fully indicated on the contract drawings shall be detailed by the Contractor in accordance with standard engineering practice. Dimensions on the drawings, as well as detailed drawings themselves, are subject in every case to measurements of existing, adjacent, incorporated and completed Work, which shall be taken by the Contractor before undertaking any Work dependent on such data.

- 4.14.7 The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Owner or A/E's approval of Shop Drawings, Product Data, Samples or Manuals under Article 2, Architect/Engineer unless the Contractor has specifically informed the Owner and A/E in writing of such deviation at the time of submission and the Owner has given specific written approval to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data, Samples or Manuals by the A/E's approval thereof.
- 4.14.8 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the Owner or A/E on previous submittals.

No portion of the Work requiring submission of Shop Drawings, Product Data, or Samples shall commence until the submittal has been approved by the Owner and A/E as provided in Article 2, Architect/Engineer. All such portions of the Work shall be in accordance with approved submittals.

- 4.14.9 For substances that are proposed for use in the Project that may be hazardous to human health, the Contractor shall submit to the A/E, for information only, information on precautions for safely using these substances, including Material Safety Data Sheets and certification of registration by the Contractor with authorities under the respective Virginia and Federal Toxic Substances Control Acts.
- 4.14.10 Unless otherwise modified by the Owner in writing, the Contractor shall label or stamp and number all Shop Drawings, Product Data, Samples or Manuals as prescribed by the Project Manager.
- 4.14.11 The Contractor shall submit a copy of each submittal, including the transmittal sheet (for shop drawings, product data, samples or manuals) to the Owner simultaneously with the Contractor's submission of said drawings, data, samples or manual packages to the A/E.

#### **4.15 EQUAL PRODUCTS:**

- 4.15.1 The term "Product" as used in the Contract Documents refers to materials, equipment, supplies, articles, fixtures, devices, types of construction, or products, as appropriate.
- 4.15.2 All products furnished shall, whenever specified and otherwise wherever practicable, be the standard products of recognized, reputable manufacturers. If the manufacturer cannot make scheduled delivery of an approved item, the Contractor may request approval of the A/E to use another brand, make, manufacturer, article, device, product, material, fixture, form or type of construction which the Contractor judges to be equal to that specified. An item need not be considered by the A/E for approval as equal to the item so named or described unless it (1) it is at least equal in quality, durability, appearance, strength, and design; (2) it will perform at least equally the specific function imposed by the general design for the work being contracted for or the material being purchased; and (3) it conforms substantially, even with

deviations, to the detailed requirements for the item in the specifications. Approval shall be at the sole discretion of the A/E and will be based upon considerations of quality, workmanship, economy of operation, suitability for the purpose intended, and acceptability for use on the project. Any such approval must be in writing to be effective, and the decision of the A/E shall be final.

4.15.4 To obtain such approval of equal products other than those specified in Contract Documents, and not previously approved during the bidding, the Contractor's request for approval of any equal product shall include the following:

- .1 Complete data substantiating compliance of the proposed equal product with the Contract Documents;
- .2 Accurate cost data on proposed equal product in comparison with product or method specified;
- .3 Product identification including manufacturer's name, address, and phone number;
- .4 Manufacturer's literature showing complete product description, performance and test data, and all reference standards;
- .5 Samples and colors in the case of articles or products;
- .6 Name and address of similar projects on which the product was used and date of installation;
- .7 All directions, specifications, and recommendations by manufacturers for installation, handling, storing, adjustment, and operation.

4.15.5 The Contractor shall also submit with his request for approval a statement which shall include all of the following representations by the Contractor, namely that:

- .1 He has investigated the proposed equal product and determined that it is equal or better in all respects to that specified and that it fully complies with all requirements of the Contract Documents;
- .2 He will meet all contract obligations with regard to this substitution;
- .3 He will coordinate installation of accepted equal products into the work, making all such changes and any required schedule adjustments, at no additional cost to the Owner, as may be required for the Work to be complete in all respects;
- .4 He waives all claims for additional costs and additional time related to equal products. He also agrees to hold the Owner harmless from claims for extra costs and time incurred by subcontractors and suppliers, or additional services which may have to be performed by the A/E, for changes or extra work that may, at some later date, be determined to be necessary in order for the Work to function in the manner intended in the Contract Documents;
- .5 He will provide the same warranty and guarantee, and perform any work required in accordance therewith, for the equal product that is applicable to the specified item for which the equal product is requested;
- .6 Material will be installed, handled, stored, adjusted, tested, and operated in accordance with the manufacturers' recommendation and as specified in the Contract Documents;

- .7 In all cases, new materials will be used unless this provision is waived in writing by, the Owner or unless otherwise specified in the Contract Documents;
  - .8 All material and workmanship will be in every respect, in accordance with that which in the opinion of the Owner, is in conformity with approved modern practice; and
  - .9 He has provided accurate cost data on the proposed equal product in comparison with the product or method specified, if applicable.
- 4.15.6 The Owner may require tests of all products proposed as equal products so submitted to establish quality standards, at the Contractor's expense. After approval of an equal product, if it is determined that the Contractor submitted defective information or data regarding the equal product upon which Owner's approval was based, and that unexpected or unanticipated redesign or rework of the Project will be required in order to accommodate the equal product, or that the item will not perform or function as well as the specified item for which equal product was requested, the Contractor will be required to furnish the original specified item or request approval to use another equal product. The Contractor shall pay all costs, expenses or damages associated with or related to the unacceptability of such an equal product and the resultant utilization of another item, and no time extension shall be granted for any delays associated with or related to such an equal product.
- 4.15.7 Equal products will not be considered for approval by the Owner if:
- .1 The proposed equal product is indicated or implied on the Contractor's shop drawing or product data submittals and has not been formally submitted for approval by the Contractor in accordance with the above-stated requirements; or
  - .2 Acceptance of the proposed equal product will require substantial design revisions to the Contract Documents or is otherwise not acceptable to the Owner.
- 4.15.8 Except as otherwise provided for by the provisions of any applicable laws, the Contractor shall not have any right of appeal from the decision of the Owner disapproving any products submitted if the Contractor fails to obtain the approval for an equal product under this Article.
- 4.15.8 If the Contractor proposes a product which the Owner determines is not equal to the product named in Contract Documents but which the Owner nevertheless is willing to accept, Contractor shall provide, upon request by the Owner, an itemized comparison of the proposed substitution with the product specified and the cost differential which shall be credited to the Owner in a Change Order issued in accordance with Article 12, Changes and Modifications in the Work.

#### **4.16 USE OF SITE**

- 4.16.1 The Contractor shall confine his operations at the site to areas permitted by law, ordinances, permits, easements, right-of-way agreements and the Contract Documents. The Contractor shall not unreasonably encumber the site, in the opinion of the Owner, with any materials, equipment or trailers, nor shall Contractor block the entrances or otherwise prevent reasonable access to the site, other working and parking areas, completed portions of the Work and/or properties, storage areas, areas of other facilities that are adjacent to the worksite. If the Contractor fails or refuses to move said material, equipment or trailers within 24 hours of Notice by the Owner to so do, the Owner shall have the right, without further Notice, to remove, at the Contractor's expense, any material, equipment and/or trailers which the Owner deems are in violation of this paragraph.

#### **4.17 CUTTING AND PATCHING OF WORK**

- 4.17.1 The Contractor shall be responsible for all cutting, fitting or patching that may be required to complete the Work and to make its several parts fit properly and in accordance with the Contract Documents.
- 4.17.2 The Contractor shall not damage or endanger any portion of the Work or the work of the Owner or any separate contractors by cutting, patching or otherwise altering any work; or by excavation. The Contractor shall not cut or otherwise alter the work of the Owner or any separate contractor except with the written consent of the Owner and of such separate contractor. The Contractor shall not unreasonably withhold from the Owner or any separate contractor Contractor's consent to cutting or otherwise altering the Work. The Owner shall not be required to accept Work with a cut, splice, or patch when such cut, splice or patch is not generally accepted practice for the particular work involved or is otherwise unworkmanlike in the opinion of the Owner.

#### **4.18 SITE CLEAN UP**

- 4.18.1 The Contractor at all times shall keep the Project site and adjacent areas free from accumulation of waste materials or rubbish caused by his operations. Before final payment is made, the Contractor shall remove all of his waste materials, rubbish, scrap materials, debris, tools, construction equipment, machinery, surplus materials, falsework, temporary structures, including foundations thereof and plant of any description, from the Project site and put the site in a neat, orderly condition.
- 4.18.2 If the Contractor fails to clean up as required herein at any time during the performance of the Work or at the completion of the Work, the Owner may, upon 24 hours notification, clean up the site at the Contractor's expense.

#### **4.19 PATENTS, ROYALTIES, ETC.**

- 4.19.1 The Contractor guarantees to save harmless the Owner, its officers, agents, servants and employees from liability of any kind or nature, including without limitation, cost, expense and attorney's fees, on account of suits and claims of any kind for violation or infringement of any patents or patent rights by the Contractor, or by anyone directly or indirectly employed by him, or by reason of the use of any art, process, method, machine, manufacture, or composition of matter patented or unpatented in the performance of this Contract in violation or infringement of any letter or rights. The Contractor agrees to pay all royalties, fees, licenses, etc. required in respect of the Work or any part thereof as part of his obligations hereunder without any additional compensation.

#### **4.20 INDEMNIFICATION**

- 4.20.1 It is hereby mutually covenanted and agreed that the relation of the Contractor to the Work to be performed by him under this Contract shall be that of an independent contractor and that as such he will be responsible for all damages, loss or injury, including death, to persons or property that may arise or be incurred in or during the conduct and progress of said work as the result of any action, omission or operation under the Contract or in connection with the Work, whether such action, omission or operation is attributable to the Contractor, subcontractor, any material supplier, or anyone directly or indirectly employed by any of them. The Contractor shall make good any damages that may occur in consequence of the Work or any part of it. The Contractor shall assume all liability, loss and responsibility of whatsoever nature by reason of his neglect or violation of any federal, state, county or local laws, regulations, codes or ordinances.
- 4.20.2 The Contractor shall indemnify, hold harmless and defend the Owner, its employees, agents, servants and representatives from and against any and all claims, suits, demands, actions (regardless of the merits thereof) and damages of whatever nature arising out of or resulting from the performance of the Work or

the failure to perform the Work, including without limitation, jurisdictional labor disputes or other labor troubles that may occur during the performance of the Work.

- 4.20.3 The indemnification obligations under this Article shall not be affected in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under worker's or workman's compensation acts, disability benefit acts or other employee benefit acts.
- 4.20.4 The obligations of the Contractor under this Article 4.20 shall not extend to the actions or omissions of the A/E, his agents or employees, arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications.
- 4.20.5 The obligations of the Contractor under this Article 4.20 shall not extend to the proportion of damages, loss or injury, including death, to persons or property that may arise or be incurred as the result of any action, omission or operation of the Owner, or Owner's separate contractor(s), and their employees, agents, servants, and/or representatives.

#### **4.21 NON-DISCRIMINATION IN EMPLOYMENT**

4.21.1 During the performance of this Contract, the Contractor agrees as follows:

- .1 The Contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment, except where there is bona fide occupational qualification reasonably necessary to the normal operation of the Contractor. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
- .2 The Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, will state that such Contractor is an equal opportunity employer.
- .3 Notices, advertisements and solicitations placed in accordance with federal law, Rule or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.
- .4 The Contractor will include the provisions of the foregoing paragraphs 1, 2, and 3 in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

#### **4.21.2 DRUG-FREE WORKPLACE REQUIRED:**

As required by section 2.2-4312 of the Code of Virginia during the performance of the Contract, Contractor agrees to (i) provide a drug-free workplace for the contractor's employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of the Contractor that the Contractor maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

For the purposes of this Article 4.21, "drug-free workplace" means a site for the performance of Work done in connection with this Contract where Contractor's employees are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during

the performance of the Contract.

#### **4.22 CONTRACT SECURITY**

- 4.22.1 The Contractor shall deliver to the Owner, within ten (10) working days from Notice of Award, two (2) originals of a Performance Bond and a separate Labor and Material Payment Bond, in a form acceptable to the Owner, and each in an amount required by the Contract Documents and the Virginia Public Procurement Act, as security for the faithful performance of the Contract, and the payment of all persons performing labor and furnishing materials in connection with this Contract. The City will not issue Notice to Proceed until the bonds are received. The amount of the Performance and Payment Bonds shall be increased to the same extent the Contract Sum is increased due to Modifications. The form of bonds shall be acceptable to the Owner, and the surety shall be such surety company or companies as are acceptable to the Owner and as are authorized to transact business in the Commonwealth of Virginia. The cost of such bonds shall be included in the Contractor's bid amount.
- 4.22.2 The bonds shall irrevocably obligate the Contractor and surety to the full amount of the bonds unless and until all of Contractor's obligations under the Contract Documents have fully been fulfilled.
- 4.22.3 If, at any time, any surety or sureties for any bond relating to the Work becomes insolvent or is determined by the Owner to be unable to adequately secure the interest of the Owner, the Contractor shall, within (30) days after Notice from the Owner to do so, substitute an acceptable bond(s) in such form and sum and with such other sureties as obligors as may be satisfactory to the Owner. The premiums on such bond(s) shall be paid by the Contractor.

### **ARTICLE 5 SUBCONTRACTORS**

#### **5.1 DEFINITIONS**

- 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform or supply any of the Work at the site. Subcontractor means a Subcontractor or his authorized representative. The term Subcontractor does not include any separate contractor performing work pursuant to Article 6 or his subcontractors.
- 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform or supply any of the Work at the site. The term Sub-subcontractor includes a Sub-subcontractor or an authorized representative thereof.
- 5.1.3 The A/E will not deal directly with any Subcontractor or Sub-subcontractor or materials supplier. Subcontractor, Sub-subcontractors or material suppliers shall route requests for information or clarification through the Contractor to the A/E, with a copy to the Owner.

#### **5.2 AWARD OF SUBCONTRACT AND OTHER CONTRACTS FOR PORTIONS OF THE WORK**

- 5.2.1 The Contractor shall submit to the Owner with a copy to the A/E prior to the award of any subcontract for Work under this Contract and thirty (30) calendar days after the award of this Contract, the names of the suppliers of principal items, systems, materials, and equipment proposed for the Work; the names and addresses, business and emergency phones of the Subcontractors which he proposes to employ under this Contract, as well as such other information as may be requested by the Owner. The Owner will review each Subcontractor and supplier based upon his apparent financial soundness and responsibility, his known or reported performance on previous similar work, and his available plant, equipment and personnel to perform the Work. The Contractor shall not employ a Subcontractor or supplier to whom the Owner reasonably objects. The Owner's objection to a proposed Subcontractor or supplier shall not affect the Contract Sum.

5.2.2 The Contractor shall make no substitutions for any Subcontractor, person or entity previously selected unless first submitted to the Owner for review and approval.

### **5.3 SUBCONTRACTUAL RELATIONS**

5.3.1 By an appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by these Contract Documents, assumes toward the Owner and the A/E. Said agreement shall preserve and protect the rights of the Owner and the A/E under the Contract Documents with respect to the Work to be performed by the Subcontractor so that the subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the Contractor-Subcontractor agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by these Contracts Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with his Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract, copies of all of the Contract Documents, and identify to the Subcontractor any terms and conditions of the proposed subcontract which may be at variance with the Contract Documents. Each Subcontractor shall similarly make copies of such Contract Documents available to his Sub-subcontractor's. Each subcontract agreement shall insure that all appropriate provisions of the Contract Documents are complied with by the Subcontractor.

5.3.2 The provisions herein regarding the City's reasonable objection to any Subcontractor shall in no way affect the liability of the Contractor to Owner regarding performance of all obligations by or payment of Subcontractors. The City's failure to object to any given Subcontractor shall not relieve the Contractor of his obligation to perform or have performed to the full satisfaction of the Owner all of the work required by this Contract.

5.3.3 Neither this article nor any other provision of the Contract Documents shall be deemed to make the Owner a joint venture or partner with the Contractor or to place the Subcontractor and materialmen in privity of contract with the Owner.

### **5.4 QUALIFICATION SUBMITTALS**

5.4.1 Specific qualification submittals may be required of the Contractor, Subcontractors, installers and suppliers for certain critical items of the Work. Required qualification submittals are set forth in detail in the Instruction to Bidders and shall be provided, collected and submitted by the Contractor to the A/E with copies to the Owner. All information required of a single Subcontractor, installer or supplier shall be contained in a single, complete submittal. The Contractor shall submit the required qualification information within ten (10) days after receipt of the Owner's request.

5.4.2 The Owner may reject any proposed Subcontractor, installer or supplier, or any qualification submittals related thereto, for the following reasons:

- .1 The Contractor's failure to submit requested information within the specified time; or
- .2 The Contractor's failure to provide all of the requested information; or
- .3 The Contractor's submission of a Subcontractor, installer or supplier, or qualifications thereof, which are unacceptable in the judgment of the Owner.

5.4.3 Should the Owner have reasonable objection to any proposed Subcontractor, installer or supplier, the Contractor shall submit another firm for approval by the Owner at no additional cost to the Owner.

## **ARTICLE 6**

## **WORK BY OWNER OR BY SEPARATE CONTRACTORS**

### **6.1 OWNER'S RIGHT TO PERFORM WORK AND TO AWARD SEPARATE CONTRACTS**

- 6.1.1 The Owner reserves the right to perform work related to the Project with his own forces, and to award separate contracts in connection with other portions of the Project or other work on the site.
- 6.1.2 When separate contracts are awarded for different portions of the Project or other work on the site, the term "contractor" in the contract documents in each case shall mean the contractor who executes each separate construction agreement.

### **6.2 MUTUAL RESPONSIBILITY**

- 6.2.1 The Contractor shall afford other contractors and the Owner reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work and shall properly connect and coordinate the Work with such other work. The Contractor shall coordinate his Work with the Owner and other contractors and store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the Work as will not unduly interfere with the progress of the Work or the work of any other contractors.
  - 6.2.1.1 If the execution or result of any part of the Work depends upon any work of the Owner or of any separate contractor, the Contractor shall, prior to proceeding with the Work, inspect and promptly report to the Owner in writing any apparent discrepancies or defects in such work of the Owner or of any separate contractor that render it unsuitable for the proper execution or result of any part of the Work.
  - 6.2.1.2 Failure of the Contractor to so inspect and report shall constitute an acceptance of the Owner's or separate contractor's work as fit and proper to receive the Work, except as to defects which may develop in the Owner's or separate contractor's work after completion of the Work and which the Contractor could not have discovered by its inspection prior to completion of the Work.
- 6.2.2 Should the Contractor cause damage to the work or property of the Owner or of any separate contractor on the Project, or to other work on the site, or delay or interfere with the Owner's work on ongoing operations or facilities or adjacent facilities or said separate contractor's work, the Contractor shall be liable for the same; and, in the case of another contractor, the Contractor shall attempt to settle said claim with such other contractor prior to such other contractor's institution of litigation or other proceedings against the Contractor.

If such separate contractor sues the Owner on account of any damage, delay or interference caused or alleged to have been so caused by the Contractor, the Owner shall notify the Contractor, who shall defend the Owner in such proceedings at the Contractor's expense. If any judgment or award is entered against the Owner, the Contractor shall satisfy the same and shall reimburse the Owner for all damages, expenses, and other costs that the Owner incurs as a result thereof.

- 6.2.3 Should Contractor have a dispute with a separate contractor with whom the Owner has contracted regarding damage to the Work or the property of Contractor or to the Work or property of said separate contractor or with regard to any delays or interferences which either Contractor or said separate contractor has caused to the performance of the other's Work, Contractor agrees to attempt to settle such dispute directly with said separate contractor. Contractor agrees that it will not seek to recover from the Owner any damages, costs, expenses (including, but not limited to, attorney's fees) or losses of profit incurred by the Contractor as a result of any damage to the Work or property of the Contractor or for any delay or interference caused or allegedly caused by any separate contractor.

**6.3 OWNER'S RIGHT TO CLEAN UP**

- 6.3.1 If a dispute arises between the Contractor and separate contractors as to their responsibility for cleaning up as required by Article 4, Contractor, the Owner may clean up and charge the cost thereof to the contractor responsible as the Owner shall determine to be just.

**ARTICLE 7 MISCELLANEOUS PROVISIONS**

**7.1 GOVERNING LAW**

The provisions of this Contract shall be interpreted in accordance with the laws of the Commonwealth of Virginia.

**7.2 PROVISIONS REQUIRED BY LAW DEEMED INSERTED**

Each and every provision of law and clause 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 it were included herein and 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.

**7.3 SUCCESSORS AND ASSIGNS**

The Owner and the Contractor each binds himself, his partners, successors, assigns and legal representatives to the other party hereto and to the partners, successors, assigns and legal representatives of such other party in respect to all covenants, agreements and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract or sublet it without the written consent of the other, nor shall the Contractor assign any monies due or to become due to him hereunder, without the previous written consent of the Owner and the Contractor's surety.

In the event the Contractor desires to make an assignment of all or part of the Contract or any monies due or to become due hereunder, the Contractor shall file a copy of consent of surety, together with a copy of the assignment to the Owner and A/E. In the event the Contractor assigns all or any part of the monies due or to become due under this Contract, the instrument of assignment shall state that the right of assignees in and to any monies due to or to become due to Contractor shall be subject to prior liens and claims of all persons, firms and corporations that provided labor services or furnished material and equipment during the performance of the Work. The rights of assignees shall further be subject to the payment of any liens, claims, or amounts due to Federal, state, or local governments.

**7.4 RIGHTS AND REMEDIES**

- 7.4.1 The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to, and not a limitation of, any duties, obligations, rights and remedies otherwise imposed or available by law, not inconsistent with the Contract Documents. No time limitations described in this Contract shall be construed to alter the applicable statutory period of limitations with regard to the enforcement of the obligations of the parties.
- 7.4.2 No action or failure to act by the Owner, A/E or Contractor shall constitute a waiver of any right or duty afforded any of them under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.
- 7.4.3 Contractor agrees that he can be adequately compensated by money damages for any breach of this Contract which may be committed by the Owner and hereby agrees that, no default, act, or omission of

the Owner or the A/E, except for failure to make payments as required by the Contract Documents, shall constitute a material breach of the Contract entitling Contractor to cancel or rescind the provisions of this Contract or (unless the Owner shall so consent or direct in writing) to suspend or abandon performance of all or any part of the Work. Contractor hereby waives any and all rights and remedies to which he might otherwise be or become entitled, saving only its right to money damages.

## **7.5 SEVERABILITY**

In the event that any provision of this Contract shall be adjudged or decreed to be invalid, such ruling shall not invalidate the entire agreement but shall pertain only to the provision in question and the remaining provisions shall continue to be valid, binding, and in full force and effect.

## **7.6 TESTS**

- 7.6.1 If the Contract Documents, laws, ordinances, rules, regulations, codes, permits, resolutions or orders of any public authority having jurisdiction require any portion of the Work to be inspected, tested or approved, the Contractor shall give the Owner at least 24 hours notice of its readiness so that the Owner or the A/E or other representatives of the Owner may observe such inspection, testing or approval. The Contractor shall bear all costs of such inspections, tests or approvals conducted by public authorities. Site inspections, tests conducted on site or tests of materials gathered on site, which the Contract requires to be performed by independent testing entities, shall be contracted and paid for by the Contractor. Examples include, but are not limited to, the testing of cast-in-place concrete, foundation materials, soil compaction, pile installations, caisson bearings, and steel framing connections.
- 7.6.2 All materials and workmanship (if not otherwise designated by the specifications) shall be subject to inspection, examination or test by the Owner, A/E, and other representatives of the Owner, at any and all times during the manufacture and/or construction and at any and all places where such manufacture and/or construction are carried on. Special, full-sized and performance tests shall be as described in the specifications. Without additional charge, the Contractor shall furnish promptly all reasonable facilities, labor and materials necessary to make tests safe and convenient.
- 7.6.3 The selection of bureaus, laboratories and/or agencies for the inspection and tests of supplies, materials or equipment shall be subject to the approval of the Owner. Satisfactory documentary evidence, including but not limited to certificates of inspection and certified test reports that the material has passed the required inspection and tests must be furnished to the Owner, with a copy to the A/E, by the Contractor prior to the incorporation of the supplies, materials or equipment into the Work or at such times as to allow for appropriate action by the Owner.
- 7.6.4 Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor. Tests required by Contractor's or Subcontractor's error, omission or non-compliance with the Contract Documents, shall be paid for by the Contractor.
- 7.6.5 It is specifically understood and agreed that an inspection and approval of the materials by the Owner shall not in any way subject the Owner to pay for the said materials or any portion thereof, even though incorporated in the Work, if said materials shall in fact turn out to be unfit to be used in the Work, nor shall such inspection be considered as any waiver of objection to the Work on account of the unsoundness or imperfection of the material used.

## **ARTICLE 8                    CONTRACT TIME**

### **8.1        DEFINITION**

8.1.1    Unless otherwise provided, the Contract Time is the period of time specified in the Contract Documents for Substantial Completion of the Work as defined herein, including authorized adjustments thereto. The Contractor shall complete his Work within the Contract Time.

8.1.2    The date of commencement of the Work is the date established in the Notice to Proceed

The Contractor shall not commence Work or store materials or equipment on site until written Notice to Proceed is issued or until the Contractor otherwise receives the Owner's written consent. The Contractor shall commence work no later than ten (10) days after the date established in the Notice to Proceed.

8.1.3    The date of Substantial Completion of the Work or designated portion thereof is the date determined by Owner when: (1) construction is sufficiently complete, in accordance with the Contract Documents, so the Owner can occupy or utilize the Work or designated portion thereof for the use for which it is intended; and (2) the Contractor has satisfied all other requirements for Substantial Completion which may be set forth in the Contract Documents.

8.1.4    The date of Final Completion of the Work is the date determined by the Owner when the Work is totally complete, to include punch list work, in accordance with the Contract Documents and the Owner may fully occupy and utilize the Work for the use for which it is intended.

8.1.5    The term "day" as used in the Contract Documents shall mean calendar days unless otherwise specifically designated.

### **8.2        PROGRESS AND COMPLETION**

8.2.1    All time limits stated in the Contract Documents, including without limitation the date of Substantial Completion of the Work, are of the essence of the Contract.

8.2.2    The Contractor shall begin the Work on the date of commencement as defined herein. He shall carry the Work forward expeditiously with adequate forces and shall achieve Substantial and Final Completion as required by the Contract Documents.

### **8.3        CLAIMS FOR TIME EXTENSIONS**

8.3.1    The time during which the Contractor is delayed in the performance of the Work by the acts or omissions of the Owner, the A/E or their employees or agents, acts of God, unusually severe and abnormal climatic conditions, fires, floods, epidemics, quarantine restrictions, strikes, riots, civil commotion or freight embargoes, or other conditions beyond the Contractor's control and which the Contractor could not reasonably have foreseen and provided against, shall be added to the time for completion of the Work (i.e., the Contract Time) stated in the Agreement; however, no claim by the Contractor for an extension of time for delays will be considered unless made in compliance with the requirements of this Article and other provisions of the Contract Documents.

8.3.2    The Owner shall not be obligated or liable to the Contractor for, and the Contractor hereby expressly waives any claims against the Owner on account of, any indirect or direct damages, costs or expenses of any nature which the Contractor, its Subcontractors, or Sub-subcontractor's or any other person may incur as a result of (1) any delays, reasonable or unreasonable, foreseeable or unforeseeable, which are either not caused by the acts or omissions of the Owner, its agents or employees or which arise from or out of (or due to) causes not within the control of the Owner, its agents or employees, or (2) any reasonable

delay regardless of its cause, it being understood and agreed that the Contractor's sole and exclusive remedy in any such events shall be an extension of the Contract Time, but only as determined in accordance with the provisions of the Contract Documents.

- 8.3.3 The burden of proof to substantiate a claim for an extension of the Contract Time shall rest with the Contractor, including evidence that the cause was beyond his control. It shall be deemed that the Contractor has control over the supply of labor, materials, equipment, methods and techniques of construction and over the Subcontractors, Sub-contractors, and suppliers, unless otherwise specified in the Contract Documents.
- 8.3.4 In the event of changes in the Work, the Contractor must identify any additional time required in the Proposed Change Order. The Owner need not consider any time extensions for changes in the Work not included in the Proposed Change Order.
- 8.3.5 No time extensions will be granted as a result of the Contractor's improper or unreasonable scheduling or for the Contractor's failure to have Shop Drawings, Product Data, Samples or Manuals submitted in ample time for review under a reasonable and agreed upon schedule.
- 8.3.6 Delays by Subcontractors, Sub-subcontractors or suppliers will not be considered justification for a time extension, except for the same valid reasons and conditions enumerated herein.
- 8.3.7 The Contractor acknowledges and agrees that actual delays due to changes, suspension of work or excusable delays; in activities which, according to the Construction Schedule, do not affect the Contract Time will not be considered to have any effect upon the Contract Time and therefore will not be the basis for a time extension.
- 8.3.8 The Contractor acknowledges and agrees that time extensions will be granted only to the extent that: (1) excusable delays exceed the available flexibility in the Contractor's schedule; and (2) Contractor can demonstrate that such excusable delay actually caused, or will cause, delay to the Contractor's schedule that will extend the Contract Time.
- 8.3.9 With respect to Suspensions of Work under Paragraph 3.6, Suspension of Work, herein, the Contractor shall be entitled to an extension of the Contract Time not to exceed the length of time that the Work was suspended (unless as determined under this Article and the other requirements of the Contract Documents that a further extension is justified and warranted) if the claim is submitted in accordance with the requirements of this Article, and if the suspension is not due to any act or omission of the Contractor, any Subcontractor or Sub-subcontractor or any other person or organization for whose acts or omission the Contractor may be liable. The Contractor's claim will be evaluated in accordance with the terms of this Article.
- 8.3.10 The Contractor shall not be entitled to any extension of time for delays resulting from any conditions or other causes unless it shall have given written Notice to the Owner, within seven (7) calendar days following the commencement of each such condition or cause, describing the occurrence, the activities impacted and the probable duration of the delay. The Contractor's complete claim submittal for a time extension shall be submitted no later than twenty (20) calendar days after cessation of the delay or within such other longer period as the Owner may agree in writing to allow.
- 8.3.11 No such extension of time shall be deemed a waiver by the Owner of his right to terminate the Contract for abandonment or delay by the Contractor as herein provided or to relieve the Contractor from full responsibility for performance of his obligations hereunder.

## **8.4 CHANGE ORDER WORK**

8.4.1 The Contractor shall make every reasonable effort to perform Change Order work within the Contract Time and in such manner as to have minimum delaying effects on all remaining Work to be performed under the Contract. If, however, the Change Order work results in an unavoidable increase in the time required to complete the Work, an extension of the Contract Time may be granted to the Contractor for the Change Order work. The Contractor's request shall be determined in accordance with the provisions of Article 8.3, Claims for Time Extensions, herein and as follows:

- .1 If the time required for performance of the Change Order work has an unavoidable, direct, delaying effect on the primary sequence of Work activities remaining after rescheduling (e.g., the critical path in CPM type scheduling), the overall Contract Time may be extended by the minimum number of days required for the Change Order work as mutually agreed upon by the Owner and the Contractor;
- .2 If the time required for performance of the Change Order work does not have an unavoidable direct delaying effect on the primary sequence of Work activities but is ordered by the Owner at a time such that insufficient Contract Time remains for completion of the Change Order work (and any limited number of contingent work activities), the Contract Time may be extended by the minimum number of days required for the Change Order work as mutually agreed upon by the Owner and the Contractor but only for the Change Order work and contingent activities, All other unaffected Work shall be performed within the Contract Time;
- .3 Failure of the Owner and the Contractor to agree on a Contract Time extension as specified in .1 and .2 above shall not relieve the Contractor from proceeding with and performing the Change Order work promptly, as well as in such manner as to have minimal delaying effects on all remaining Work to be performed under the Contract. Such disagreement shall be resolved as soon as practical by negotiation.

## **8.5 LIQUIDATED DAMAGES FOR DELAY**

8.5.1 The damages incurred by the Owner due to the Contractor's failure to complete the Work within required Milestone Dates and the Contract Time, including any extensions thereof, shall be in the amount set forth in the Construction Agreement, for each consecutive day beyond the Milestone Dates or the Contract Time (Sundays and all holidays included) for which the Contractor shall fail to complete the Work.

8.5.2 The parties hereby agree that the amount of liquidated damages provided in this Contract is neither a penalty nor a forfeiture and is intended to compensate the Owner solely for the Owner's inability to use the Work for its fully intended purpose, and is not intended to, nor does said amount include: (1) any damages, additional or extended costs; incurred by the Owner for extended administration of this Contract, or by the Owner's agents, consultants or independent contractors for extended administration of this Contract, or (2) any additional services, relating to or arising as a result of the delay in the completion of the Work. Owner shall be entitled to claim against Contractor for its actual damages ~~and~~ for any damages not specifically included within the liquidated damages as set forth herein. Such damages shall be computed separately, and, together with liquidated damages, either deducted from the Contract Sum or billed to the Contractor, at the option of the Owner.

Contractor agrees that it will not challenge the per diem amounts of liquidated damages imposed pursuant to this Article 8.5 except as to whether Contractor is responsible for the delays, themselves, that have resulted in the assessment of liquidated damages. The Contractor waives any challenge as to the validity of any liquidated damages specified on the grounds that such liquidated damages allegedly are void as penalties or allegedly are not reasonably related to Owner's actual damages.

Owner may, in its sole discretion, deduct from any payments otherwise due Contractor amounts of liquidated damages assessable under this Article 8.5. Owner's failure to deduct liquidated damages assessable under this Article 8.5 from payments to Contractor shall not be deemed a waiver by Owner of any entitlement to such liquidated damages.

**8.6 TIME EXTENSIONS FOR WEATHER**

8.6.1 The Contract Time will not be extended due to inclement weather conditions that are normal to the general locality of Work site. The time for performance of this Contract includes an allowance for workdays (based on a 5-day workweek) which, according to historical data, may not be suitable for construction work.

.1 The following is the schedule of monthly anticipated normal inclement weather workdays for the Project location and will constitute the base line for monthly weather time extension evaluations.

<b>ANTICIPATED NORMAL INCLEMENT WEATHER WORK-DAYS INCLUDED IN THE CONTRACT TIME OF PERFORMANCE</b>											
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
7	7	7	7	9	7	7	7	6	6	6	7

8.6.2 The Contractor, in his planning and scheduling of the Work as required by the Contract Documents, shall allow for the normal inclement weather for the locality of the Work site. If the Contractor believes that the progress of the Work has been adversely affected and that it will directly result in a failure to meet Substantial Completion within the Contract Time, by weather conditions above and beyond the amount normally expected, he shall submit a written request to the Owner, with a copy to the A/E, for an extension of time, pursuant to Paragraph 8.3, Claims for Time Extensions.

8.6.3 Such request shall be evaluated by the Owner in accordance with the provisions of the Contract Documents and shall include a comparison of actual weather statistics compiled by City of Lynchburg's Department of Public Works, for the time of year, locality of the particular Work site with the days claimed by the Contractor and the anticipated normal inclement weather as stated in subparagraph 8.6.1. The normal inclement weather expected has been included in the designated Contract Time for completion. The decision of the Owner shall be final.

8.6.4 The Contractor shall not be entitled to any money damages whatsoever for any delays resulting from inclement weather, whether normal or abnormal, foreseeable or unforeseeable. The Contractor and Owner stipulate and agree that, for delays due to weather as determined in 8.6.3, the Contractor's sole relief is a time extension granted in accordance with this Article 8.6, Time Extensions for Weather.

**ARTICLE 9 PAYMENTS AND COMPLETION**

**9.1 CONTRACT SUM**

9.1.1 The Contract Sum is stated in the Construction Agreement and, including authorized adjustments thereto, is the total amount payable by the Owner to the Contractor for the performance of the Work under the Contract Documents. The Contract Sum includes, but is not limited to, the Contractor's profit and general overhead and all costs and expenses of any nature whatsoever (including without limitation taxes, labor, equipment and materials), foreseen or unforeseen, and any increases in said costs and expenses, foreseen or unforeseen, incurred by the Contractor in connection with the performance of the Work, all of which

costs and expenses shall be borne solely by the Contractor. The Contractor agrees to assume all increases in costs of any nature whatsoever that may develop during the performance of the Work.

## **9.2 SCHEDULE OF VALUES**

- 9.2.1 For Lump Sum Price contracts, before the pre-construction meeting, the Contractor shall submit to the Owner and A/E a schedule of values allocated to the various portions of the Work, prepared on payment forms provided by the Owner and supported by such data to substantiate its accuracy as the Owner may require. This schedule of values, unless rejected by the Owner, shall be used as a basis for the Contractor's Applications for Payment.
- 9.2.2 For Unit Price contracts, the Contractor shall utilize the payment request form provided by the Owner, wherein the schedule of values shall correspond with the individual unit price bid items. When so requested by the Owner, the Contractor shall provide a more detailed cost breakdown of the unit price items.
- 9.2.3 Contractor may include in his schedule of values a line item for "mobilization" which shall include a reasonable amount for mobilization for the Contractor and his Subcontractors. The Contractor shall not front-end load his schedule of values.

## **9.3 APPLICATION FOR PAYMENT**

- 9.3.1 The Contractor shall submit to the A/E three (3) originally executed, itemized Applications for Payment (and one (1) copy to the Owner) by the tenth of each month, along with any authorized change orders for that billing cycle. The Applications for Payment shall be notarized, indicate in complete detail all labor and material incorporated in the Work during the month prior to submission, and supported by such data substantiating the Contractor's payment request as the Owner may require. The Applications for Payment shall also contain Contractor's certification that due and payable amounts and bills have been paid by the Contractor for Work for which previous Certificates of Payment were issued and payments received from the Owner.
- 9.3.2 Payment may be made for the value of materials, which are to be incorporated into the finished Work, and which are delivered to and suitably stored and protected on the Work site. The Contractor shall provide releases or paid invoices from the seller of such materials to establish, to the Owner's satisfaction, that the Owner has title to said material. Stored materials shall be in addition to the Work completed and shall be subject to the same retainage provisions as the completed Work. Material once paid for by the Owner becomes the property of the Owner and may not be removed from the Work site without the Owner's written permission.
- 9.3.3 The requirements for payment for materials stored off-site shall include, but are not limited to, those specified in Paragraph 9.3.2 and the additional requirements hereinafter specified. Material stored off-site under this provision shall be included in the definition of Work, Article 1, Contract Documents.
  - 9.3.3.1 The requirements of Paragraph 10.2, Safety of Persons and Property, are fully applicable to materials stored off-site.
  - 9.3.3.2 For purposes of administering this provision, the following definitions are provided.
    - a. Material stored NEAR the Work site: A storage location shall be considered near the Work site if it is not more than fifty (50) miles (approximately a one-hours drive) from the Work site.

b. Material stored DISTANT from the Work site: Locations beyond the limit of fifty (50) miles shall be considered distant.

- 9.3.3.3 All proposed off-site locations, regardless of whether they are near or distant, shall be approved by the Owner prior to any payment under this Article. The approval process will include an inspection of the proposed storage site, which may or may not coincide with any inspection of materials stored.
- 9.3.3.4 Prior to payment for any material stored off-site, said material shall be inspected to verify that it is properly stored; i.e., segregated, inventoried, identified as the property of the Owner and Contractor, and duly protected as required in Article 10.2, Safety of Persons and Property. This material shall be clearly identified and physically segregated from any other material or stock, in such a manner that it is clear, from casual observation that said material is not a part of any other stock or stored material.
- 9.3.3.5 For materials stored distant to the Work site, the Contractor shall reimburse the Owner for all reasonable costs incurred by the Owner, to include but not limited to salary, transportation, lodging and per diem, for the Owner's or the A/E's employees to travel to and from the storage locations for the purpose of verifying that the material is properly stored. It is anticipated that such trips would occur whenever additional material is claimed for payment and/or at least every six (6) months until the material is delivered to the Work site.
- 9.3.3.6 Except for unusual circumstances, the Contractor will not be required to reimburse the Owner's costs for visits to storage locations near the Work site.
- 9.3.3.7 The Contractor shall hold the Owner harmless from any and all losses, additional costs, direct or indirect damages and/or delays, whatsoever, which may occur as a result of a failure of the Contractor to deliver (or have delivered), in a timely manner, materials (for which payment has been made) to the Work site for installation and incorporation into the Work.
- 9.3.3.8 The Contractor shall provide to the Owner a release of lien or other suitable certification by the seller of the materials, in addition to paid invoices, verifying that the Contractor has valid title to all materials for which payment is requested. The seller, however, shall not be required to waive his rights for recovery against Contractor or any surety if his contract is breached.
- 9.3.4 The Contractor warrants that title to all Work, materials and equipment covered by an Application for Payment will pass to the Owner, either by incorporation in the construction or upon the receipt of payment by the Contractor, whichever occurs first, free and clear of all liens, claims, security interests or encumbrances, hereinafter referred to as "liens". The Contractor further warrants that no Work, materials or equipment covered by an Application for Payment will have been acquired by the Contractor or by any other person performing Work at the site or furnishing materials and equipment for the Work that is subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.
- 9.3.5 The Contractor's Application for Payment shall provide that the payment request attests that all Work for which the request is made has been completed in full according to all the requirements of the Contract Documents. By submitting his Application for Payment, the Contractor also represents that he has no knowledge that any Subcontractors or suppliers have not been fully and timely paid and that, insofar as he knows, the only outstanding items for payment with respect to the Contract are those to be paid from the funds for which application is being made.

#### **9.4 CERTIFICATES FOR PAYMENT**

- 9.4.1 The A/E will, within seven (7) calendar days after the receipt of the Contractor's Application for Payment, recommend a Certificate for Payment to the Owner, for such amount as the A/E determines is properly

due, with his reasons for any withholding or adjusting a Certificate as provided in Paragraph 9.6, Payments Withheld.

- 9.4.2 After the Certificate for Payment is recommended by the A/E, the Owner will review it and make any changes deemed necessary by the Owner's representative. The recommendation of the Certificate for Payment by the A/E does not waive or limit the Owner's right to reduce the amount of the payment due to the Contractor as determined to be appropriate by the Owner.
- 9.4.3 The recommendation of a Certificate for Payment will constitute a representation by the A/E to the Owner, based on his observations at the site as provided in Article 2, Architect/Engineer, and the data comprising the Application for Payment, that the Work has progressed to the point indicated; that, to the best of his knowledge, information and belief: (1) the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial or Final Completion, to the results of any subsequent tests required by or performed under the Contract Documents, to minor deviations from the Contract Documents correctable prior to completion, and to any specific qualifications stated in his Certificate); and that (2) the Contractor is entitled to payment in the amount certified. However, by recommending a Certificate for Payment, the A/E shall not thereby be deemed to represent that he has made exhaustive or continuous on-site inspections to check the quality or quantity of the Work or that he has reviewed the construction means, methods, techniques, sequences or procedures, or that he has made any examination to ascertain how or for what purpose the Contractor has used the moneys previously paid on account of the Contract Sum.
- 9.4.3.1.1 The Application for Payment shall be on a form approved by the City. Payment for stored material delivered but not incorporated in the work will be the invoiced amount only. Stored materials drawdown shall be approved by the Owner. Submit applicable invoices with Application for Payment. Monthly partial payment request shall be submitted in **TRIPLICATE** to Owner's representative for approval by the 25th of the month so that the Owner can approve payment request by the first working day of the next month. Partial payments shall be made on a monthly basis on or before the end of the next month for which the Work was performed, in accordance with the Contract Documents.
- 9.4.3.1.2 The Owner shall pay to the Contractor 95 percent of the total amount due and the Owner shall retain five (5) percent of the amount due until all work has been performed strictly in accordance with the Contract Documents and until such work has been accepted by the Owner.
- 9.5.1 The Owner shall make payment in the manner and within thirty (30) calendar days after receipt of the Certificate of Payment from the A/E based upon the Owner's approval or adjustment of said Certificate. The Contractor shall be paid the amount approved or adjusted by the Owner, less 5% retainage which is being held to assure faithful performance; provided however, that said retainage is not applicable to Time and Material Change Orders.
- 9.5.1.1 In relation to punch list or other uncompleted Work and in lieu of a portion of the above-specified five-percent 5% retainage, the Owner may, at its sole discretion, elect to retain fixed amounts directly relating to the various items of uncompleted Work. All amounts withheld shall be included in the Final Payment.
- 9.5.2 The Contractor shall, within seven (7) days after receiving payment from the Owner, do one of the following:
- 9.5.2.1 Pay all Subcontractors for the proportionate share of the total payment received from the Owner for Work performed by each Subcontractor under the Contract; or

- 9.5.2.2 Notify the Owner and Subcontractor(s), in writing, of his intention to withhold all or part of the Subcontractor's payment with the reason for nonpayment.
- 9.5.3 The Contractor shall make payment to Subcontractors as heretofore specified. Each payment shall reflect the percentage actually retained, if any, from payments to the Contractor on account of such Subcontractor's Work.
- 9.5.4 The Contractor shall provide the Owner with his social security number, if an individual, or his federal identification number, if a corporation, partnership, or other entity.
- 9.5.5 The Contractor shall pay unpaid Subcontractors interest on payments that are not made in accordance with this Article 9.5, Progress Payments. The rate of interest shall be in compliance with the Prompt Payment section of the Virginia Public Procurement Act of the Code of Virginia. The Contractor shall, by an appropriate agreement with each Subcontractor, require each Subcontractor to make payments to his Sub-subcontractors according to all the same requirements as provided in this Article 9.5 Progress Payments.
- 9.5.6 The Owner may, upon written request, furnish to any Subcontractor, if practicable, information regarding the percentages of completion or the amounts applied for by the Contractor and the action taken thereon by the Owner on account of Work done by such Subcontractor.
- 9.5.7 Neither the Owner nor the A/E shall have any obligation to pay or to see to the payment of any monies to any Subcontractor except as may otherwise be required by law.
- 9.5.8 No Certificate for Payment, nor any payment, nor any partial or entire use or occupancy of the Project by the Owner, shall constitute an acceptance of any Work not in accordance with the Contract Documents, nor shall it waive any right or claim by Owner based upon the Work, or any portion of the Work, including Work for which payment has been made, not conforming to the requirements of the Contract Documents.

## **9.6 PAYMENTS WITHHELD**

- 9.6.1 The Owner may withhold the payment in whole or in part, if necessary to reasonably protect the Owner. If the A/E is unable to make representations as provided in subparagraph 9.4.3 and to recommend payment in the amount of the application, he will notify the Owner as provided in subparagraph 9.4.1. If the Contractor and the Owner cannot agree on a revised amount, the Owner will promptly issue a Certificate for Payment for the amount for which he is able to make representations with respect to payment, due for Work performed. The Owner may also decline to certify or make payment because of subsequently discovered evidence or subsequent observations, and the Owner may nullify the whole or any part of any Certificate for Payment previously issued.
- 9.6.2 The Owner may withhold from the Contractor so much of any payment approved by the A/E, as may in the judgment of the Owner be necessary:
- .1 To protect the Owner from loss due to defective work not remedied;
  - .2 To protect the Owner upon receipt of notice of the filing in court or in an arbitration proceeding as may be required in any third party contract, of verified claims of any persons supplying labor or materials for the Work, or other verified third party claims;
  - .3 To protect the Owner upon reasonable evidence that the Work will not be completed for the unpaid balance of the Contract Sum;

- .4 To protect the Owner upon reasonable evidence that the Work will not be completed within the Contract Time established by this Contract; or
- .5 To protect the Owner upon the Contractor's failure to properly schedule and coordinate the Work in accordance with or as required by the Contract Documents, or failure to provide progress charts, revisions, updates or other scheduling data as required by the Contract Documents, or upon the Contractor's failure to provide as-built drawings as required herein, or upon Contractor's failure to otherwise substantially or materially comply with the Contract Documents.

9.6.3 If required by the Contract Documents, the Contractor shall, concurrent with his submission of the Construction Schedule, submit a practicable and realistic payment schedule showing the dates on which the Contractor will submit each and every Application for Payment and the amount he expects to receive for each and every monthly progress payment. If during the performance of the Work, the Contractor expects to receive an amount for a monthly progress payment larger than that indicated on the payment schedule, the Contractor shall notify the Owner at least thirty (30) days in advance of that payment so that the necessary allocation of funds can be processed. If Contractor fails to submit a practicable and realistic payment schedule, the Contractor's Application for Payment shall be honored only to the extent that the Work is actually performed and that the proportion of payments made to the Contract Sum does not exceed the proportion of the Contract Time expired as of the time of the request.

## **9.7 FAILURE OF PAYMENT**

If the Owner does not make payment to the Contractor within the thirty (30) calendar days after receipt of the Contractor's Application for Payment by the A/E through no fault of Contractor, and the Owner otherwise not being entitled under the Contract Documents or applicable law to withhold payment, then the Contractor may, upon fifteen (15) additional days' written Notice to the Owner and the A/E, stop the Work until payment of the amount owing has been received. In such event, the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, which shall be effected by appropriate Change Order as provided herein.

## **9.8 SUBSTANTIAL COMPLETION AND GUARANTEE BOND**

9.8.1 Unless otherwise specified in Article 9.9, Final Completion and Final Payment, when the Contractor considers that the Work, or a designated portion thereof which is acceptable to the Owner, is substantially complete as defined in Article 8, Contract Time, the Contractor shall request in writing that the A/E and the Owner perform a Substantial Completion inspection. Prior to such inspection the Contractor shall:

- .1 If applicable, secure a Certificate of Occupancy for the Project or a designated portion thereof; and
- .2 Submit five (5) copies each of the Operations and Maintenance Manuals to the A/E as specified and one (1) copy to the Owner.

9.8.2 The Owner shall determine whether the Work is substantially complete and shall compile a punch list of items to be completed or corrected. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

9.8.3 When the Owner on the basis of his inspection determines that the Work or a designated portion thereof is substantially complete, the A/E will then prepare a Certificate of Substantial Completion which shall establish the Date of Substantial Completion and shall state the responsibilities of the Owner and the Contractor for security, maintenance, heat, utilities, damage to the Work and insurance. The Certificate of Substantial Completion shall be submitted to the Owner and the Contractor for their written acceptance of the responsibilities assigned to them in such Certificate.

- 9.8.4 The Contractor shall have thirty (30) days from the Date of Substantial Completion to complete all items on the punch list to the satisfaction of the Owner. If the Contractor fails to complete all punch list items within the designated time, the Owner shall have the option to correct or conclude any remaining items by utilizing its own forces or by hiring others. The cost of such correction of remaining punch list items by the Owner or others shall be deducted from the final payment to the Contractor, and if the Owner has not retained sufficient funds to cover the cost, Contractor or its surety shall pay the difference within 30 days of a written demand by the Owner to do so.
- 9.8.5 Guarantees and warranties required by the Contract Documents shall commence on the Date of Final Completion of the Work, unless otherwise provided in the Certificate of Substantial or Final Completion, or the Contract Documents. Provided, however, that if Contractor does not complete certain punch list items within the time period, specified in 9.8.4, all warranties and guarantees for such incomplete Punch List items shall become effective upon issuance of final payment for the Work.
- 9.8.5.1 The Contractor shall guarantee for a term of one (1) year from the date of Final Completion or Final Payment, whichever comes later, (unless otherwise provided for in the Certificate(s) of Substantial or Final Completion or the Contract Documents): (1) the quality and stability of all materials equipment and Work; (2) all the Work against defects in materials, equipment or workmanship; and (3) all shrinkage, settlement or other faults of any kind which are attributable to defective materials or workmanship. The Contractor shall remedy at his own expense, when so notified in writing to do so by the Owner, and to the satisfaction of the Owner, the Work or any part thereof that does not conform to any of the warranties and guaranties described in the Contract Documents- or that otherwise does not conform to the requirements of the Contract Documents
- 9.8.5.2 In order to make good the guarantee as herein required, the Contractor shall deposit with the Owner, after Substantial Completion but before Final Payment, a Guarantee Bond(s) issued by a surety licensed to do business in Virginia and otherwise acceptable to the Owner, for the faithful performance of the guarantee. Said Bond(s) shall be for a period of one (1) year from the date the guaranties and warranties commence and in the amount of five percent (5%) of the final gross value of the Contract.
- 9.8.5.3 The Contractor shall complete repairs during the guarantee period, within five (5) working days after the receipt of Notice from the Owner, and if the Contractor shall fail to complete such repairs within the said five (5) working days, the Owner may employ such other person or persons as it may deem proper to make such repairs and pay the expenses thereof out of any sum retained by it, provided nothing herein contained shall limit the liability of the Contractor or his surety to the Owner for non-performance of the Contractor's obligations at any time.
- 9.8.6 The issuance of the Certificate of Substantial Completion does not indicate final acceptance of the Work by the Owner, and the Contractor is not relieved of any responsibility for the Work except as specifically stated in the Certificate of Substantial Completion.
- 9.8.7 Upon Substantial Completion of the Work, or designated portion thereof, and upon application by the Contractor and certification by the A/E, the Owner shall make payment, adjusted for retainage and payments withheld, if any, for such Work or portion thereof, as provided in the Contract Documents.
- 9.8.8 Should the Owner determine that the Work or a designated portion thereof is not substantially complete, he shall provide the Contractor a written Notice stating why the Work or designated portion is not substantially complete. The Contractor shall expeditiously complete the Work and shall re-request in writing that the Owner perform a Substantial Completion inspection.

## **9.9 FINAL COMPLETION AND FINAL PAYMENT**

9.9.1 A Certificate of Final Completion shall be issued by the A/E prior to final payment. At the Owner's sole option, this Final Completion Certificate may be issued without a Certificate of Substantial Completion. The Contractor, prior to application for Final Payment and within the time specified for completion of the Work, shall complete all Work, to include punch list items and provide operation and maintenance manuals and as-built data, for the Work, as completed and in place. Said Certificate of Final Completion shall be issued, even if a Certificate of Substantial Completion has been issued previously and temporary authority to operate the Work has been granted.

9.9.1.1 The Certificate of Final Completion shall certify that all Work has been completed in accordance with Contract Documents and is ready for use by the Owner.

9.9.2 For all projects where Substantial Completion Certificates have been issued for various portions of the Work, at differing times, the Contractor shall request and the Owner shall, prior to final payment, issue a Certificate of Final Completion which certifies that all required Work, including punch list items, has been completed in accordance with the Contract Documents.

9.9.3 Neither the final payment nor any remaining retainage shall become due until the Contractor submits to the A/E the following:

- .1 An Application for Payment for all remaining monies due under the -Contract.
- .2 Consent of surety to final payment;
- .3 If required by the Owner, other data establishing payment or satisfaction of all such obligations, such as receipts, releases and waivers of claims arising out of the Contract, to the extent and in such form as may be designated by the Owner. If any Subcontractor refuses to furnish waiver of claims satisfactory to the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify Owner against any such claim. If any such claim remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all monies that the latter may be compelled to pay in discharging such claim, including all costs and reasonable attorneys' fees;
- .4 As-built drawings, operation and maintenance manuals and other project closeout submittals, as required by the Contract Documents;
- .5 Construction releases as required by the Contract Documents from each property owner on whose property an easement for construction of the Work has been obtained by the Owner, such release to be in the forms to be provided by the Owner. This release is for the purpose of releasing the Owner and the Contractor from liability, claims, and damages arising from construction operations on or adjacent to the easement and includes proper restoration of the property after construction. It shall be the Contractor's sole responsibility to obtain all such releases and furnish them to the Owner; and
- .6 A written certification that:
  - .1 The Contractor has reviewed the requirements of the Contract Documents,
  - .2 The Work has been inspected by the Contractor for compliance with all requirements of the Contract Documents,
  - .3 Pursuant to this inspection, the Contractor certifies and represents that the Work complies in all respects with the requirements of the Contract Documents,

- .4 The Contractor further certifies and represents that all equipment and systems have been installed in accordance with the Contract Documents and have been tested in accordance with specification requirements and are operational, and
  - .5 The Contractor hereby certifies and represents that the Work is complete in all respects and ready for final inspection.
- 9.9.4 Upon receipt of the documents required in subparagraph 9.9.3 and upon receipt of a final Application for Payment, the A/E and Owner will promptly make a final inspection. When the A/E finds the Work acceptable under the Contract Documents and the Contract fully performed, he will issue within seven (7) days a final Certificate for Payment and a Final Certificate of Completion.

The Certificate of Completion will state that to the best of his knowledge, information and belief, and on the basis of his observations and inspections, the Work has been completed in accordance with the terms and conditions of the Contract Documents and that the entire balance designated in the final Certificate for Payment is due and payable. The final Certificate for Payment will constitute a further representation that the conditions precedent to the Contractor's being entitled to final payment as set forth in Subparagraph 9.9.3 have been fulfilled. The Owner shall review the Certificate of Payment and shall accept it and issue final acceptance, or reject it and notify the Contractor, within ten (10) days. Final payment to the Contractor shall be made within thirty (30) days after final acceptance. All prior estimates and payments, including those relating to Change Order work, shall be subject to correction by this final payment.

9.9.5 The making of Final Payment shall constitute a waiver of all claims by the Owner, except those arising from:

- .1 Unsettled claims;
- .2 Faulty, defective, or non-conforming Work discovered or appearing after Substantial or Final Completion;
- .3 Failure of the Work to comply with the requirements of the Contract Documents;
- .4 Terms of any warranties or guarantees required by the Contract Documents; or
- .5 Fraud or bad faith committed by the Contractor or any subcontractor or supplier during performance of Work but discovered by Owner after Final Payment.

9.9.6 The acceptance of Final Payment shall constitute a waiver of all claims by the Contractor, except those previously made in writing and so identified by the Contractor; as unsettled at the time of the final Application for Payment. No payment, however, final or otherwise, shall operate to release the Contractor or his sureties from any obligations under this Contract or the Performance, Payment, or Guarantee Bonds.

## **ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY**

### **10.1 SAFETY PRECAUTIONS AND PROGRAMS**

10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. The requirement applies continuously throughout the Contract performance, until Final Payment is made, and is not limited to regular working hours.

## **10.2 SAFETY OF PERSONS AND PROPERTY**

10.2.1 The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

- .1 All persons performing any of the Work and all other persons who may be affected thereby;
- .2 All the Work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor or any of his Subcontractors or Sub-subcontractor's. Machinery, equipment and all hazards shall be guarded or eliminated in accordance with the safety provisions of the Manual of Accident Prevention in Construction published by the Associated General Contractors of America, to the extent that such provisions are not in contravention of applicable law; and
- .3 Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

10.2.2 The Contractor shall give all notices and comply with all applicable laws, ordinances, codes, rules, regulations, permits, resolutions and lawful orders of any public authority bearing on the safety of persons or property or their protection from damage, injury or loss.

The Contractor shall at all times safely guard the Owner's property from injury or losses in connection with the Contract. Contractor shall at all times safely guard and protect his Work and adjacent property as provided by law and the Contract Documents, from damage. All passageways, guard fences, lights and other facilities required for protection by local authorities or local conditions must be provided and maintained without additional cost to the Owner.

10.2.3 The Contractor shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities.

10.2.4 When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.

10.2.5 The Contractor is responsible for the proper packing, shipping, handling and storage (including but not limited to shipment or storage at the proper temperature and humidity) of materials and equipment to be incorporated in the Work, so as to insure the preservation of the quality and fitness of the materials and equipment for proper installation and incorporation in the Work, as required by the Contract Documents.

For example, but not by way of limitation, Contractor shall, when necessary, place material and equipment on wooden platforms or other hard and clean surfaces and not on the ground and/or place such material and equipment under cover or in any appropriate shelter or facility. Stored materials or equipment shall be located so as to facilitate proper inspection. Material and equipment that is delivered crated shall remain crated until ready for installation. Lawns, grass plots or other private property shall not be used for storage purposes without the written permission of the owner or lessee unless otherwise within the terms of the easements obtained by the Owner.

10.2.6 In the event of any indirect or direct damage to public or private property referred to in Paragraphs 10.2.1.2 and 10.2.1.3, caused in whole or in part by an act, omission or negligence on the part of the Contractor, any Subcontractor, any Sub-subcontractor, or anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable, the Contractor shall at his own expense

and cost promptly remedy and restore such property to a condition equal to or better than existing before such damage was done. The Contractor shall perform such restoration by underpinning, replacing, repairing, rebuilding, replanting, or otherwise restoring as may be required or directed by the Owner, or shall make good such damage in a satisfactory and acceptable manner. In case of failure on the part of the Contractor to promptly restore such property or make good such damage, the Owner may, upon two (2) calendar days written Notice, proceed to repair, replace, rebuild or otherwise restore such property as may be necessary and the cost thereof, or a sum sufficient in the judgment of the Owner to reimburse the owners of property so damaged, will be deducted from any monies due or to become due the Contractor under the Contract. If insufficient monies remain due or will become due to pay such sum, Contractor or its surety shall, within 30 days of receipt of a written demand from Owner to do so, pay Owner such sum.

- 10.2.7 The Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents and the protection of material, equipment and other property. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner.
- 10.2.8 The Contractor shall not load or permit any part of the Work to be loaded so as to endanger the safety of any portion of the Work.
- 10.2.9 The Contractor shall give notice in writing at least forty-eight (48) hours before breaking ground, to all persons, Public Utility Companies, owners of property having structures or improvements in proximity to site of the Work, superintendents, inspectors, or those otherwise in charge of property, streets, water pipes, gas pipes, sewer pipes, telephone cables, electric cables, railroads or otherwise, who may be affected by the Contractor's operation, in order that they may remove any obstruction for which they are responsible and have representative(s) on site to see that their property is properly protected. Such notice does not relieve the Contractor of responsibility for any damages and claims. Nor does such notice relieve the Contractor from his responsibility to defend and indemnify the Owner from actions resulting from the Contractor's performance of such work in connection with or arising out of the Contract.
- 10.2.10 The Contractor shall protect all utilities encountered while performing its work, whether indicated on the Contract Drawings or not. The Contractor shall maintain utilities in service until moved or abandoned. The Contractor shall exercise due care when excavating around utilities and shall restore any damaged utilities to the same condition or better as existed prior to starting the Work, at no cost to the Owner. The Contractor shall maintain operating utilities or other services, even if they are shown to be abandoned on the drawings, in service until new facilities are provided, tested and ready for use.
- 10.2.11 The Contractor shall return all improvements on or about the site and adjacent property which are not shown to be altered, removed or otherwise changed to conditions which existed prior to starting the Work.
- 10.2.12 The Contractor shall protect the Work, including but not limited to, the site, stored materials and equipment, excavations, and excavated or stockpiled soil or other material, intended for use in the Work, and shall take all necessary precautions to prevent or minimize damage to same and to prevent detrimental effect upon his performance or that of his Subcontractors, caused by or due to rain, snow, ice, run-off, floods, temperature, wind, dust, sand and flying debris. For example, but not by way of limitation, Contractor shall, when necessary, utilize temporary dikes, channels or pumping to carry-off, divert or drain water, and shall as necessary tie-down or otherwise secure the Work and employ appropriate covers and screens.

### **10.3 OBLIGATION OF CONTRACTOR TO ACT IN AN EMERGENCY**

- 10.3.1 In case of an emergency that threatens immediate loss or damage to property and/or safety of life, the Contractor shall act to prevent threatened loss, damage, injury or death. The Contractor shall notify the Owner of the situation and all actions taken immediately thereafter. If the Contractor fails to act and any loss, damage, injury or death occurs that could have been prevented by the Contractor's prompt and immediate action, the Contractor shall be fully liable to the Owner or any other party for all costs, damages, claims, actions, suits, costs of defense, and all other expenses arising therefrom or relating thereto.
- 10.3.2 Prior to commencing the Work and at all times during the performance of the Work, the Contractor shall provide the Owner two, twenty-four hour (24) emergency phone numbers where his representatives can be contacted at any time.

## **ARTICLE 11 INSURANCE FOR CONTRACTS**

### **11.1 CONTRACTOR'S INSURANCE**

- 11.1.1 During the term of this Contract, the Contractor shall procure and maintain insurance coverages with insurance companies rated by A. M. Best Company as A – VIII or better. The company(ies) shall be authorized to do business under the laws of the Commonwealth of Virginia and be acceptable to the City of Lynchburg and shall provide the following minimum types of insurance:
- a. **Commercial General Liability Insurance** – This will cover claims for Bodily Injury, Property Damage, Personal and Advertising Injury, Products and Completed Operations, which may arise from operations under the Contract, whether such operations be performed by the Contractor or by any Subcontractor or Independent Contractor, or by anyone directly or indirectly employed by any of them. Such insurance shall include coverages "X", "C" and "U" for explosion, collapse of other structures and underground utilities, as well as Contractual Liability Insurance covering the requirements outlined in the General Conditions. This insurance shall name the City, the City Council and its employees as additional insureds *by endorsement* to the Commercial General Liability policy. Such policy shall not have a restriction on the limits of coverage provided to the City of Lynchburg as an additional insured. The City of Lynchburg shall be entitled to protection up to the full limits of the Contractor's policy regardless of the minimum requirements specified in this Contract. If endorsements to the Commercial General Liability insurance policies cannot be made, then separate policies providing such protection shall be purchased by the Contractor.

1. The Policy shall have the following *minimum* limits:

\$1,000,000 Each Occurrence Limit  
\$1,000,000 General Aggregate Limit  
\$1,000,000 Personal and Advertising Injury Limit  
\$1,000,000 Products and Completed Operations Aggregate Limit  
\$5,000 Medical Expense Limit

This insurance shall include the following provisions and /or endorsements:

- 1) The General Aggregate limit shall apply on a "per project" and on a "per location" basis;
- 2) Coverage shall apply to all liability arising from all premises and operations conducted by the Contractor, Subcontractors and independent contractors;
- 3) The Contractor agrees that liability arising from Products and Completed Operations will be covered. Such liability coverage will be maintained for two years after completion of the Work.

- 4) The Contractor shall require each of his Subcontractors to procure and maintain Commercial General Liability Insurance of the type specified in these Contract Documents in the minimum amounts required by the Owner and the Contractor (which shall be the amounts required by this paragraph 11.1.1. of Contractor unless otherwise agreed in writing by Owner), during the term of their subcontracts.

b. **Worker's Compensation and Employer's Liability Insurance** for the Contractor's employees engaged in the Work under this Contract, in accordance with statutory requirements of the Commonwealth of Virginia. The Contractor shall require each of his Subcontractors to provide Worker's Compensation and Employer's Liability Insurance for all of the Subcontractor's employees engaged on such subcontracts. If any class of employees engaged on Work under the Contract is not protected under the Worker's Compensation statute, the Contractor shall provide similar protection for these employees in amounts not less than the legal requirements. The amount of Employer's Liability Insurance for the Contractor and each of his Subcontractors shall be not less than:

\$100,000 per employee for Bodily Injury.  
\$100,000 per employee for disease  
\$500,000 per policy for disease

The Worker's Compensation and Employer's Liability Insurance policy shall include an "all states" or "other states" endorsement.

c. **Commercial Automobile Liability Insurance**, including coverage for owned, hired, non owned and borrowed vehicles used in the work with *minimum* limits of \$1,000,000 Combined Single Limit per occurrence. This insurance shall name the City, the City Council and its employees as additional insureds *by endorsement* to the Commercial Automobile Liability policy. Such policy shall not have a restriction on the limits of coverage provided to the City of Lynchburg as an additional insured. The City of Lynchburg shall be entitled to protection up to the full limits of the Contractor's policy regardless of the minimum requirements specified in this Contract.

d. **Umbrella Liability or Excess Liability Insurance** with the following minimum limits of:

\$5,000,000 Each Occurrence  
\$5,000,000 Annual Aggregate

The following policies shall be scheduled as underlying policies:

Commercial General Liability  
Commercial Automobile Liability  
Employers Liability

This insurance shall name the City, the City Council and its employees as additional insureds *by endorsement* to the Umbrella or Excess Liability policy. Such policy shall not have a restriction on the limits of coverage provided to the City of Lynchburg as an additional insured. The City of Lynchburg shall be entitled to protection up to the full limits of the Contractor's policy regardless of the minimum requirements specified in this Contract.

- 11.1.2 Proof of insurance for each type of coverage listed herein shall be provided within 10 days after issuance of the award letter for the Contract, and no Work shall proceed unless all such insurance is in effect. The Contractor shall not allow any Subcontractor to commence work on his subcontract until all such insurance of the Subcontractor has been so obtained and approved by the Contractor and found to be in accordance with the requirements set forth herein. The Contractor certifies by commencement of

the Work that his insurance and that of Subcontractors is in effect and meets the requirements set forth herein.

- 11.1.3 The Contractor shall purchase and maintain required liability and all other insurance as is appropriate for the Work being performed and furnished. The insurance shall provide protection from claims which may arise out of or result from Contractor's performance and furnishing of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed or furnished by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform or furnish any of the Work, or by anyone for whose acts any of them may be liable:
- a. claims under Worker's Compensation, Employers Liability, disability benefits, and other similar employee benefit acts;
  - b. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
  - c. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
  - d. claims for damages insured by personal injury liability coverage which are sustained: (1) by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor; or (2) by any other person for any other reason;
  - e. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
  - f. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle.
- 11.1.4 The insurance required to be purchased and maintained by the Contractor shall:
- a. include completed operations insurance;
  - b. with respect to any other insurance coverage written on a claims-made basis, remain in effect for at least 2 years after final payment (and Contractor shall furnish the City and A/E evidence satisfactory to the City of continuation of such insurance at final payment and 1 year thereafter);
  - c. contain a cross liability or severability of interest clause or endorsement. Insurance covering the specified additional insureds shall be primary insurance, and all other insurance carried by the additional insureds shall be excess insurance.
- 11.1.5 All of the aforesaid insurance policies must be endorsed to provide that the insurance company ***shall give 30 days written notice to the City*** if the policies are to be terminated or if any changes are made during the Contract period which will affect in any way the insurance provided pursuant to such policy. Before starting the Work, the Contractor shall provide the City with a copy of each policy that he and each of his Subcontractors is required to carry in accordance with this Article 11, together with receipted bills evidencing proof of premium payment. These policies shall contain endorsements to the policies naming the City of Lynchburg as an additional insured as required.
- 11.1.6 Nothing contained herein shall effect, or shall be deemed to affect, a waiver of the City's sovereign immunity under law.

## **ARTICLE 12                    CHANGES AND MODIFICATIONS IN THE WORK**

### **12.1    *CHANGES IN THE WORK***

12.1.1    The Owner, without invalidating the Contract and without notice to the surety, may order a change to the Work consisting of additions, deletions or other revisions to the general scope of the Contract, or changes in the sequence of the performance of the Work. The Contract Sum and the Contract Time shall be adjusted accordingly. All such changes in the Work shall be authorized by Change Order, Modification, or Change Directive, and all Work involved in a change shall be performed in accordance with the terms and conditions of the Contract Documents. If the Contractor should proceed with a change in the Work upon an oral order, by whomsoever given, it shall constitute a waiver by the Contractor of any claim for an increase in the Contract Sum and/or Contract Time, on account thereof.

### **12.2    *FIELD ORDER***

12.2.1    A Field Order is a written order to the Contractor signed by the Owner's designated representative, interpreting or clarifying the Contract Documents or directing the Contractor to perform minor changes in the Work. Any work relating to the issuance of a Field Order shall be performed promptly and expeditiously and without additional cost to the Owner and within the Contract Time, unless the Contractor submits a Proposed Change Order, defined below, which is approved by the Owner. Field Orders shall be numbered consecutively by date of issuance by the Owner.

### **12.3    *OWNER CHANGE REQUEST***

12.3.1    An Owner Change Request is a written request from the Owner to the Contractor that describes a proposed change in the Work. The Contractor is required to submit a complete proposal for the total cost and additional time, if any, necessary to perform the proposed change in the Work. Owner Change Requests shall be numbered consecutively by date of issuance by the Owner.

### **12.4    *CONTRACTOR'S PROPOSED CHANGE ORDER***

12.4.1    A Contractor's Proposed Change Order is a written request from the Contractor to the Owner requesting a change in the Contract Sum and/or Contract Time. A Contractor's Proposed Change Order is submitted as a proposal in response to a Owner Change Request or as a claim for an increase in the Contract Sum or Contract Time pursuant to the issuance of a Field Order, or as a result of unforeseen circumstances, such as an unknown site conditions.

Change Orders for unforeseen site conditions will only be entertained if the Contractor has not accepted responsibility for the unforeseen site conditions pursuant to other provisions in the Contract Documents. A Contractor's Proposed Change Order must be submitted within twenty (20) calendar days of the issuance of a Owner Change Request or a Field Order or the discovery of an unforeseen circumstance. The Contractor shall not be entitled to any adjustment to the Contract Time or Contract Sum if Contractor fails to comply strictly with the requirements of the preceding sentence. Contractor's Proposed Change Orders shall be numbered consecutively by date of issuance by the Contractor. The Contractor shall also indicate on the Proposed Change Order the number of the Owner Change Request or the Field Order to which it responds. The Contractor understands and agrees to the City's provisions and policy regarding Change Orders as outlined in Article 1, section 1.1.2 of these General Conditions.

12.4.2    In the case of unit price items, it is understood and agreed by the Contractor that the estimates of the quantities in unit price items are approximate only and are presented solely for the purpose of comparing bids and may not represent the actual amount of work to be performed. The Contractor, therefore, understands and agrees that the Owner reserves the right to increase, decrease or eliminate

entirely the quantity of work to be done under any item. If called upon to do more work under any unit price item named in the Bid Documents, he will perform all such additional work and accept as payment the unit price named in the proposal, subject to the 20% deviation limitations specified in subparagraph 12.4.2.2.

- 12.4.2.1 The Contractor's Proposed Change Order shall be determined by applicable unit prices, if any, as set forth in the Contract.
- 12.4.2.2 However, if changes in quantities are of an item increase the actual work to more than twenty percent (20%) of the original bid quantity for that item, or decrease quantities of that item more than 20% of the original bid quantity for that item, then the Owner or the Contractor shall have the right to request a decrease or an increase in the unit price for the item for quantities greater than 120% or less than 80% of the original bid quantity for that item.
- 12.4.2.3 It shall be understood that such unit prices shall constitute full payment for the extra work performed, including, but not limited to, "general conditions" costs, plant, materials, labor, equipment, overhead, profit, and safety requirements.
- 12.4.3 If no such unit prices are set forth, the Contractor's proposal shall be on a lump sum basis and shall be itemized and segregated by labor, equipment, and materials for the various components of the change in the Work (no aggregate labor total will be acceptable) and shall be accompanied by signed proposals of any Subcontractors who will perform any portion of the change in the Work and of any persons who will furnish materials or equipment for incorporation therein.
  - 12.4.3.1 The portion of the proposal relating to labor, whether by the Contractor's forces or the forces of any of its Subcontractors, may include reasonably anticipated gross wages of job site labor, including foremen, who will be directly involved in the change in the Work (for such time as they will be so involved), plus separately identified payroll costs (including premium costs of overtime labor, if overtime is authorized, Social Security, Federal or State unemployment insurance taxes and fringe benefits required by collective bargaining agreements entered into by the Contractor or any such Subcontractor in connection with such labor).
  - 12.4.3.2 The portion of the proposal relating to materials may include the reasonably anticipated direct costs to the Contractor or to any of its Subcontractors of materials to be purchased for incorporation in the change in the Work, plus transportation and applicable sales or use taxes.
  - 12.4.3.3 The proposal may further include the Contractor's and any of his Subcontractor's reasonably anticipated equipment rental costs, except small hand tools, in connection with the change in the Work.
- 12.4.4 Base Cost is defined as the total of labor, material and equipment rentals as described in subparagraphs 12.4.3.1, 12.4.3.2 and 12.4.3.3. The actual net cost in money to the Owner for the change in the Work shall be computed as follows:
  - .1 If the Contractor performs the change in the Work without use of Subcontractors or sub-subcontractors, his compensation will be the Base Costs as described above, plus a maximum mark-up of 15% for overhead and profit.
  - .2 If the work is performed by a bona fide Subcontractor, the Subcontractor's compensation will be the Base Costs as described above plus a maximum mark-up of 15% for overhead and profit. The

Contractor's compensation will be a maximum mark-up of five percent (5%) of the Subcontractors Base Costs for his overhead and profit.

.3 If the Work is performed by a bona fide Sub-subcontractor, the Subcontractor's compensation will be the Base Costs as herein described, plus a maximum mark-up of 15% for overhead profits. The mark-up of any Sub-subcontractor's work by the Contractor and all intervening tiers of Subcontractors shall not exceed a total of 10%.

12.4.5 The mark-up on the cost of labor, materials, and equipment described in Paragraphs 12.4.4.1, 12.4.4.2, and 12.4.4.3 shall be all the compensation to which the Contractor, Subcontractors and Sub-subcontractor are entitled for all indirect costs associated with or relating to the change in the Work including, but not limited to, labor and/or equipment inefficiency, changes in sequence, delays, interferences, impact on unchanged work, gross receipts tax, superintendent, small tools, reproduction, administration, insurance, unrelated safety requirements, temporary structures and offices, all other general and administrative, home office and field office expenses.

12.4.6 The Proposed Change Order may also include the cost of increases in premiums for the Payment Bond and the Performance Bond, provided coverage for the cost of the change in Work results in such increased costs. At the Owner's request, the Contractor shall provide proof of his notification to the surety of the change in the Work and of the surety's agreement to include such change in its coverage. The cost of the increase in premiums shall not be marked up.

12.4.7 In the event that it is necessary to increase the Contract Time in order to perform the change in the Work, the Contractor shall provide an estimate of the increase in the Contract Time as part of the Proposed Change Order. The Contractor's request for a time extension shall be evaluated in accordance with the criteria described in Article 8.3, Claims for Time Extensions.

12.4.8 If the Contractor's Proposed Change Order is rejected by the Owner as being within the scope of the Work required by the Contract Documents, the Owner may, at its sole option and discretion, direct the Contractor to perform the Work which is the subject of the said Proposed Change Order, with claimed compensation to be accounted for pursuant to 12.6 and to be subject to the procedures of Article 13. The Contractor shall then promptly proceed with said Work. Nothing herein shall excuse the timely performance by the Contractor of the Work because any Proposed Change Order is pending.

## **12.5 CHANGE ORDER**

12.5.1 A Change Order is a written order to the Contractor signed by the Owner, issued after execution of the Contract, authorizing a change in the Work or an adjustment in the Contract Sum and/or the Contract Time. The Contract Sum and the Contract Time may be changed only by Change Order. A Change Order signed by the Contractor indicates his agreement therewith, including the adjustment in the Contract Sum and/or the Contract Time. Change Orders shall be numbered consecutively by date of issuance by the Owner and shall, if applicable, indicate the number of the Field Order(s), Request for Proposal(s) and/or Proposed Change Order(s) to which they relate.

12.5.1.1 If the Owner determines that the Contractor's Proposed Change Order, submitted pursuant to Article 12.4 for a change in the Contract Sum or Contract Time, is acceptable, the Owner shall prepare and issue a Change Order which will authorize the Contractor to proceed with the change in the Work with the adjustment to Contract Sum and Contract Time stated in the Proposed Change Order, or as otherwise may be agreed upon by the parties. The amounts stated in the Change Order for the adjustment to Contract Sum and Contract Time for the change in the Work shall be binding on the parties.

- 12.5.2 After issuance of the Change Order, the Contractor shall ensure that the amount of the Performance and Payment Bond coverage has been revised to reflect the increase in the Contract Sum due to the Change Order. Notwithstanding the foregoing, Contractor's failure to do so shall not release any surety from its obligations under any bonds.

## **12.6 CHANGE DIRECTIVE**

- 12.6.1 If Owner and Contractor cannot agree as to whether something constitutes a change to the Work originally contemplated by the Contract Documents, or if they cannot agree as to the adjustment to the Contract Sum or Contract Time required for what Owner acknowledges to be a change to the Work constituting Extra Work, Owner may, in his sole discretion, issue a written Change Directive directing Contractor to perform such work. Contractor shall then promptly proceed with the work at issue. Owner may elect, in its sole discretion, to have the compensation or claimed compensation for such work accounted for on either a time and material basis or lump sum basis as described in 12.6.2 and 12.6.3.
- 12.6.2 If Owner elects to have the compensation and/or claimed compensation accounted for on a time and materials basis, the following procedures apply:
- 12.6.2.1 Change Directive work, the compensation or claimed compensation for which is being accounted for on a time and material basis shall be performed, whether by the Contractor's forces or the forces of any of its Subcontractors' or Sub-subcontractors', at actual cost to the entity performing the Work (without any charge for administration, clerical expense, supervision or superintendent of any nature whatsoever). The percent mark-ups for the Contractor, Subcontractors and Sub-subcontractor's shall be as described in subparagraphs 12.4.4 and 12.4.5.
- 12.6.2.2 Prior to starting the Change Directive work on a time and material basis, the Contractor shall notify the Owner in writing as to what labor, materials, equipment or rentals are to be used for the change or claimed change in the Work. During performance, the Contractor shall submit to the Owner daily time and material tickets, which shall list the categories and amounts of labor and equipment for which Change Directive compensation is to be charged for the previous work day. Such tickets shall specifically include the following information: location and description of the change in the Work, the classification of labor employed, including names and social security numbers of laborers, labor trades used, man hours, wage rates, insurance, taxes and fringe benefits, equipment and materials suppliers' quotations with detailed break-out and pricing, rental equipment hours and rates, and materials quantities and unit prices and such other evidence of cost as the Owner may require.
- 12.6.2.3 The Contractor shall commence submission of daily time and material tickets immediately upon commencement of the Change Directive work and continue to submit them until completion of the Change Directive work. The Owner may require authentication of all time and material tickets and invoices by persons designated by the Owner for such purpose.
- 12.6.2.4 No payment will be made to the Contractor for any portion of the Change Directive work that Owner acknowledges to be Extra Work unless and until such daily time and material tickets and invoices are submitted. The submission of any such ticket or invoice shall not constitute an acknowledgment by the Owner that the items thereon were reasonably required for the Change Directive work.

12.6.2.5. For any work performed on a time and material basis, the Contractor shall submit its complete submission of the reasonable actual cost and time to perform the change in the Work within twenty (20) days after such Work has been completed. If Change Directive work includes both Work that Owner acknowledges to be Extra Work and work that Owner disputes to be Extra Work, Contractor shall clearly segregate its accounting for the two. The Owner shall review the costs and time submitted by the Contractor on the basis of reasonable expenditures and savings of those performing the Change Directive work. If such costs and time are acceptable to the Owner, or if the parties otherwise agree to the actual reasonable cost to perform the Change Directive work, a Change Order will be issued for the cost and time agreed upon. The amounts stated in the Change Order for the cost and time to perform the Change Directive work shall be binding upon the parties.

12.6.3 If Owner elects to have the compensation or claimed compensation accounted for on a lump sum basis, Owner may make a unilateral determination of a reasonable adjustment in Contract Sum and Contract Time due to the Change Directive. Any unresolved dispute about the reasonableness of Owner's unilateral determination shall be subject to Article 13, Claims and Dispute Procedure.

## **12.7 DECREASES AND WORK NOT PERFORMED (Deductive Change Orders)**

12.7.1 Should it be deemed expedient by the Owner to decrease the dimensions, quantity of material or Work, or vary in any other way the Work required by the Contract Documents, the Owner may direct by written Change Order, such decreases to be made or performed without in any way affecting the validity of the Contract. The Contractor shall comply with the Change Order from the Owner. The difference in expense occasioned by such decrease shall be deducted from the amount payable under this Contract.

12.7.2 When Work is deleted from the Contract by Owner, the amounts to be credited to the Owner shall reflect the same current pricing as if the Work were being added to the Contract at the time the deletion is ordered, and Contractor shall provide documentation for a credit as specified in Article 12.5.4. If such deleted materials and equipment shall have already been purchased and stored on site and cannot be used in other projects, cannot be returned for credit or cannot be returned for credit at the price paid by the Contractor at the time of purchase, the Contractor shall be entitled, upon proper documentation and certification, to an adjustment in the pricing of the credit to avoid hardship to the Contractor. If necessary in order to establish such reasonable value, the Contractor may be required to submit a detailed breakdown of his original bid and all documents upon which Contractor's bid was based for the items or Work involved.

12.7.3 If Work is not performed, and such deletion of Work was not directed or approved by the Owner, the Owner shall ascertain the amount of the credit due.

## **12.8 CHANGES IN LINE AND GRADE**

12.8.1 The Owner reserves the right to make such alterations in the line and grade of various structures or pipe lines shown on the drawings, as may be necessitated by conditions found during construction or that in the judgment of the Owner appears advisable. Such alterations shall in no way affect the validity of the Contract

12.8.1.1 In case of a unit price contract, if such changes increase the amount of the Work or materials, the Contractor will be paid according to the quantity of Work actually done at the prices established for such Work under the Contract.

12.8.1.2 In case of a lump sum contract, the price for the Work shall be determined as specified in Article 12.4, Proposed Change Order.

## **12.9 SUBSURFACE CONDITIONS FOUND DIFFERENT**

12.9.1 Should the Contractor encounter subsurface and/or latent conditions at the site materially differing from those shown on the drawings or indicated in the specifications, he shall immediately give Notice to the Owner of such conditions before they are disturbed. The Owner shall thereupon promptly investigate the conditions and if he finds that they materially differ from those shown on the drawings or indicated in the specifications, he shall at once make such changes in the drawings and/or specifications as he may find necessary. Any increase or decrease of cost resulting from such changes shall be adjusted in the manner provided herein for adjustments as to extra and/or additional work and changes. Notwithstanding the foregoing, if the Contract Documents indicate elsewhere that excavation is to be on an unclassified basis, Contractor shall not be entitled to any adjustment to the Contract Sum or Contract Time based upon this 12.9.

## **12.10 OTHER CLAIMS**

If the Contractor claims that additional cost or time is involved because of, but not limited to, (1) any written interpretation pursuant to Article 2, Architect/Engineer, (2) any order by the Owner to stop the Work pursuant to Article 3, Owner, where the Contractor was not at fault, (3) failure of payment by the Owner pursuant to Article 9 Payments and Completion, or (4) any written order for a minor change in the Work issued pursuant to Article 12.8, Changes in Line and Grade, the Contractor shall make such claim as provided in Section 12, Changes and Modification in the Work, and Article 13, Claims and Dispute Procedure.

## **ARTICLE 13 CLAIMS AND DISPUTE PROCEDURE**

Any Claims by the Contractor arising under or relating to the Contract or the Contract Documents shall only be resolved as follows:

### **13.1. INITIAL NOTICE, SUBMISSION OF CLAIM, AND CONSIDERATION.**

- a. The Contractor shall give the Owner and the A/E written notice of any Claim within ten (10) days of the beginning of the occurrence of the event leading to the Claim. The written notice shall be a document from the Contractor addressed to the Owner's and A/E's officials or employees designated by the Contract Documents to receive such notice, or if no one is so designated, to the Owner's City Manager and to the A/E. The written notice shall clearly state the Contractor's intention to make a claim, shall describe the occurrence involved, and shall be transmitted in a manner to ensure receipt by the Owner and A/E within the ten (10) days. The Contractor shall submit the Claim and any supporting data to the Owner and A/E within thirty (30) days after the occurrence giving rise to the Claim ends. The burden shall be on the Contractor to substantiate that it has given written notice and submitted its Claim in accordance with this provision.
- b. The Claim must (i) be certified under oath as true and correct by a principal of Contractor; (ii) must be for specific relief; (iii) if any money is sought, must specify the dollar amount sought; and (iv) must contain sufficient supporting documentation to reasonably allow its consideration, including without limitation, any documentation required by the Contract Documents. The burden shall be on the Contractor to substantiate the Claim.
- c. The Contractor shall comply with all other terms and conditions of the Contract Documents, including without limitation, those in Articles 8 and 12, as applicable. No decision by the A/E on

a claim shall be binding on the Owner, but such decision shall have whatever effect on the Contractor that the Contract Documents provide.

- d. Following consideration by the A/E, and following initial, informal consideration by the Owner's City Manager or his designee, the parties shall endeavor to resolve any Claim through direct negotiations, and if such direct negotiations fail, and if the Owner requests, by non-binding mediation conducted pursuant to the Rules of the American Arbitration Association, with the site of the mediation being Lynchburg, Virginia.
- e. Should the Claim remain unresolved for more than 60 days after it is submitted, then the City Manager or his designee shall, within no later than 90 days after the Claim's submission, render a written decision on the Claim on behalf of the Owner . The Contractor may not institute any legal action with respect to the Claim until after the City Manager or his designee renders his written decision or 90 days from its receipt by the City Manager has passed, whichever comes first. The only effect of the failure by the City Manager or his designee to render a decision within this 90-day period is to allow the Contractor to institute a legal action pursuant to this provision without having to wait for a decision on the Claim concerned.

### **13.2 APPEAL OF DENIAL OF CLAIM.**

- a. If the Owner denies in whole or part a Claim by Contractor or more than 90 days have passed since the Claim was received by the City Manager but no written decision has been issued, the Contractor may appeal denial of the claim by instituting an action in the Lynchburg Circuit Court, Lynchburg, Virginia, or if the subject or amount in controversy is within its jurisdiction, the Lynchburg General District Court, Lynchburg, Virginia, and may thereafter pursue all available appeals in Virginia state courts, to the extent they have jurisdiction.
- b. The Contractor must initiate its appeal of the Claim within 180 days of the date it first has the right to do so or the Claim will be barred and the Owner's decision will be binding and conclusive.
- c. The Contractor may not amend its Claim on appeal to increase the amount of money sought.
- d. In the event of any Claim arising, Contractor shall continue its performance diligently during such Claim's pendency and thereafter as if no Claim had arisen. During the pendency of any Claim in connection with the payments of moneys, Contractor shall be entitled to receive payments for non-disputed items, subject to any right of set-off by Owner.

13.3 Notwithstanding anything in the Contract Documents to the contrary, the Owner may, in its discretion, assert a Claim without first resorting to any procedures contained in the Contract Documents.

13.4 "Claim" means a "claim" as defined in the Lynchburg Public Procurement Code.

13.5 Notwithstanding anything in the Contract Documents to the contrary, Owner shall not be liable to Contractor for any damages or increase in the Contract Sum due to delays to Contractor, any Subcontractor, or any other person except due to extent required by Virginia Code § 2.2-4335.

## **ARTICLE 14 UNCOVERING AND CORRECTION OF WORK**

### **14.1 UNCOVERING OF WORK**

14.1.1 If any portion of the Work should be covered contrary to: (1) the request of the A/E or Owner; (2) requirements specifically expressed in the Contract Documents; or (3) the requirements of applicable

permits, it must, if required in writing by the Owner, be uncovered for the Owner's and A/E's observation and shall be replaced at the Contractor's expense.

- 14.1.2 If any other portion of the Work has been covered which the Owner has not specifically requested to observe prior to being covered, the Owner may request to see such Work and it shall be uncovered by the Contractor. If such Work be found in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner. If such Work be found not in accordance with the Contract Documents, the Contractor shall pay such costs unless it is found that this condition was caused solely by the Owner, in which event the Owner shall be responsible for the payment of such costs. If such Work be found not in accordance with the Contract Documents and the condition was caused by a separate contractor, Contractor may proceed against said separate contractor as provided in Article 6, Work by Owner or by Separate Contractors.

## **14.2 WARRANTY AND CORRECTION OF WORK**

14.2.1 The Contractor guarantees and warrants to the Owner all Work as follows:

- .1 That all materials and equipment furnished under this Contract will be new and the best of its respective kind unless otherwise specified;
- .2 That all Work will be of first-class quality and free of omissions and faulty, imperfect or defective material or workmanship;
- .3 That the Work shall be entirely watertight and leakproof in accordance with all applicable industry customs and practices, and shall be free of shrinkage and settlement which are attributable to defective materials or workmanship;
- .4 That the Work, including but not limited to, mechanical and electrical machines, devices and equipment shall be fit and fully usable for its intended and specified purpose and shall operate satisfactorily with ordinary care;
- .5 That consistent with requirements of the Contract Documents the Work shall be installed and oriented in such a manner as to facilitate unrestricted access for the operation and maintenance of fixed equipment; and
- .6 That the Work will be free of abnormal or unusual deterioration which occurs because of poor quality materials or workmanship.

14.2.2 All Work not conforming to guarantees and warranties specified in the Contract Documents, including substitutions not properly approved and authorized, may be considered defective. If required by the Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment furnished and installed.

14.2.3 The Contractor shall within five (5) working days after receipt of written Notice from the Owner during the performance of the Work, reconstruct, replace or correct all Work rejected by the A/E or Owner as defective, as failing to conform to the Contract Documents, or as not in accordance with the guarantees and warranties specified in the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs of reconstructing, replacing or correcting such rejected Work, including compensation for the A/E's additional services made necessary thereby.

14.2.4 If, within one (1) year after the Date of Final Completion of the Work or designated portion thereof or within one (1) year after acceptance by the Owner of designated equipment or within such longer period

of time as may be prescribed by law or by the terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be defective, not in accordance with the Contract Documents, or not in accordance with the guarantees and warranties specified in the Contract Documents, the Contractor shall correct it within five (5) working days after receipt of a written Notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition pursuant to 14.3, Acceptance of Faulty, Defective or Non-Conforming Work. This obligation shall survive termination of the Contract. The Owner shall give such Notice within a reasonable time after discovery of the condition.

- 14.2.5 Subject to limitation as prescribed by law, if at any time deficiencies in the Work are discovered which are found to have resulted from fraud or misrepresentation, or an intent or attempt to defraud the Owner by the Contractor, any Subcontractor or supplier, the Contractor will be liable for replacement or correction of such Work and any damages which Owner has incurred related thereto, regardless of the time limit of any guarantee or warranty.
- 14.2.6 Any materials or other portions of the Work, installed, furnished or stored on site which are not of the character or quality required by the specifications, or are otherwise not acceptable to the Owner, shall be immediately removed and replaced by the Contractor to the satisfaction of the Owner, when notified to do so by the Owner.
- 14.2.7 If the Contractor fails to correct defective or nonconforming Work as required by Articles 13.2.3 and 13.2.4, or if the Contractor fails to remove defective or nonconforming Work from the site, as required by Article 13.2.6, the Owner may elect to either correct such Work in accordance with Article 3.5, Owner's Right to Carry Out the Work, or remove and store materials and equipment at the expense of the Contractor. If the Contractor does not pay the cost of such removal and storage within ten (10) days thereafter, the Owner may, upon ten additional days written Notice, sell such Work at auction or at public or private sale and shall account for the net proceeds thereof, after deducting the costs of the sale and all of the costs that should have been borne by the Contractor, including compensation for the A/E's additional services made necessary thereby. If such proceeds of sale do not cover all costs indicated in the previous sentence, the difference shall be charged to the Contractor and an appropriate Change Order shall be issued. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor or its surety shall pay the difference to the Owner.
- 14.2.8 The Contractor shall bear the cost of making good all work of the Owner, separate contractors or others, destroyed or damaged by such correction or removal required under this Article.

### **14.3 ACCEPTANCE OF FAULTY, DEFECTIVE OR NON-CONFORMING WORK**

If the Owner prefers to accept faulty, defective or nonconforming Work, he may do so instead of requiring its removal and correction, in which case a Change Order will be issued at Owner's option, to reflect a reduction in the Contract Sum in an amount to be determined by the Owner.

## **ARTICLE 15 TERMINATION OF THE CONTRACT**

### **15.1 CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE CONTRACT**

If the Work should be stopped under an order of any court or other public authority for a period of ninety (90) days through no fault of the Contractor or anyone providing services, materials or equipment through him, or if the Owner should fail to pay to the Contractor within thirty (30) days any sum for which a Certificate of Payment has been certified when no dispute exists as to the sum due and Owner has no right to withhold payment under any provision of the Contract Documents, then the Contractor may, upon ten (10) days written Notice to the Owner, stop Work or terminate the Contract and recover from the Owner payment for the cost of the Work actually performed, together with overhead and profit thereon, but profit on the Work performed shall be recovered only to the extent that the Contractor can demonstrate that he

would have had profit on the entire Contract if he had completed the Work. The Contractor may not receive profit or any other type of compensation for parts of the Work not performed. The Contractor may recover the reasonable cost of physically closing down the Site, but no other costs of termination. The Owner may offset any claims it may have against the Contractor against the amounts due to the Contractor. In no event shall termination of the Contract by the Contractor terminate the obligations of the Contractor's surety on its payment and performance bonds.

## **15.2 OWNER'S RIGHT TO TERMINATE CONTRACT FOR CAUSE**

15.2.1 The Owner may terminate the Contract for cause based upon any of the following grounds:

- .1 If the Contractor should be adjudged as bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency.
- .2 If the Contractor should refuse or should repeatedly fail, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials and equipment.
- .3 If the Contractor should fail to make prompt payment to subcontractors or suppliers of material of labor.
- .4 If the Contractor should disregard laws, ordinances, codes, regulations, or the written instructions of the Architect/Engineer or the Owner.
- .5 If the Contractor be in substantial violation of any provision of the Contract Documents.

15.2.2 For termination for cause based upon the grounds in 15.2.1.1, Owner may terminate without prior notice and without giving Contractor any opportunity to rectify the basis for termination. For termination for cause based upon any other grounds, prior to termination of the Contract, the Owner shall give the Contractor and his surety Notice followed by a ten (10) day period during which the Contractor and/or his surety may rectify the basis for the Notice. If rectified to the satisfaction of the Owner within said ten (10) days, the Owner may rescind its notice of termination. If not, the termination for cause shall become effective at the end of the ten (10) day notice period. Notwithstanding the foregoing, the Owner may, in writing, postpone the effective date of the termination for cause, at its sole discretion, if it should receive reassurances from the Contractor and/or his surety that the basis for the termination will be remedied within a time and in a manner which the Owner finds acceptable. If at any time after such postponement, the Owner determines that Contractor and/or his surety has not or is not likely to rectify the causes of termination in an acceptable manner or within the time allowed, then the Owner may immediately terminate the Contract for cause, without the necessity of allowing any further opportunity by the Contractor and/or surety to rectify the basis for the Notice, by notifying the Contractor and his surety in writing of the termination. In no event shall termination for cause terminate the obligations of the Contractor's surety on its payment and performance bonds.

15.2.3 Upon termination of the Contract, the Contractor shall immediately cease Work, and the Owner may take possession of the site and of all materials, tools and equipment thereon and finish the Work by whatever method he may deem expedient. In such case, the Contractor shall not be entitled to receive any further payment until the Owner has finally completed the Work through its own resources or those of a subsequent contractor. If the Owner's damages, including the expense of finishing the Work, compensation for additional design, managerial and administrative services, any liquidated damages, and any claims by the Owner, shall exceed the unpaid balance of the Contract Sum, the Contractor shall pay the difference to the Owner, together with any other expenses of terminating the Contract and having it completed by others. If the unpaid balance of the Contract Sum exceeds Owner's damages, including the costs of finishing the Work, compensation for additional design, managerial and administrative services,

any liquidated damages and any claims by Owner, together with any other expenses of terminating the Contract and having it completed by others, such excess shall be paid to the Contractor.

15.2.4 If it should be judicially determined that the Owner improperly terminated this Contract for cause, then the termination shall be deemed to be a termination for the convenience of the Owner, with Contractor's recovery limited to what is allowed for a termination for convenience under the Contract Documents.

15.2.5 Termination of the Contract under this Section is without prejudice to any other right or remedy of the Owner.

### **15.3 OWNER'S RIGHT TO TERMINATE CONTRACT FOR CONVENIENCE**

15.3.1 Owner may terminate this Contract, in whole or in part, at any time without cause upon giving the Contractor written Notice of such termination. Upon such termination, the Contractor shall immediately cease Work and remove from the site all of its labor forces and such of its materials and equipment as Owner elects not to purchase or to assume in the manner hereinafter provided. Upon such termination, the Contractor shall take such steps as Owner may require to assign to the Owner the Contractor's interest in all subcontracts and purchase orders designated by Owner. After all such steps have been taken to Owner's satisfaction, the Contractor shall receive as full compensation for termination and assignment the following:

- .1 Amounts due for Work performed in accordance with the Contract through the date of termination.
- .2 Reasonable compensation for the actual cost of demobilization incurred by the Contractor as a direct result of such termination. The Contractor shall not be entitled to any compensation or damages for lost profits or for any other type of contractual compensation or damages other than those provided by the preceding sentence. Upon payment of the foregoing, Owner shall have no further obligations to Contractor of any nature.

15.3.2 In no event shall termination for the convenience of the Owner terminate the obligations of the Contractor's surety on its payment and performance bonds.

15.3.3 After receipt of a Notice of termination, the Contractor shall promptly submit to the Owner his termination claim. Such claim shall be submitted no later than forty-five (45) days from the effective date of termination. Upon failure of the Contractor to submit his termination claim within the time allowed, the Owner may determine, on the basis of information available to it, the amount, if any, due to the Contractor by reason of the termination.

### **15.4 CONTRACTOR'S RESPONSIBILITIES UPON TERMINATION**

15.4.1 After receipt of a notice of termination pursuant to 15.3, Owner's Right to Terminate Contract for Convenience, the Contractor shall mitigate any damages to the extent reasonably possible.

15.4.2 In addition to the provisions of 15.4.1, the Contractor shall:

- .1 At the option of the Owner, assign to the Owner, in the manner, at the time, and to the extent directed by the Owner, all of the right, title, and interest of the Contractor under the orders and subcontracts so terminated, in which case the Owner shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts;
- .2 Transfer title and deliver to the Owner in the manner, at the times, and to the extent, if any, directed by the Owner:

- a) The fabricated or un-fabricated parts, work in process, completed Work, supplies, and other material and equipment procured as a part of, or acquired in connection with the performance of the Work terminated by the Notice of Termination, and
  - b) The completed or partially completed drawings, releases, information, manuals and other property which, if the Contract had been completed, would have been required to be furnished to the Owner;
- .3 Complete performance of such part of the Work as shall not have been terminated by the Notice of Termination; and
- .4 Take such action as may be necessary, or as the Owner may direct, for the protection and preservation of the property related to this Contract which is in the possession of the Contractor and in which the Owner has or may acquire an interest.

PROJECT MANUAL FOR



LYNCHBURG CITY ARMORY ELEVATOR REPLACEMENT

CITY OF LYNCHBURG, VIRGINIA

MEAD Project No. 262-214

June 10, 2013



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## TABLE OF CONTENTS

### DRAWINGS

NUMBER	TITLE
TS	Title Sheet
D1.1	Demolition Plan & Notes
A1.1	Partial Floor Plan, Roof Plan, Elevations & Exterior Wall Assembly
A1.2	Base Bid Elevator Section
A1.3	Alternate #1 Elevator Section & Alternate #2 Elevator Section
A1.4	Stair Section, Handrail Section
S-1	Structural
ME-1	Mechanical & Electrical Plans
E-1	Electrical Reference Drawings

### SPECIFICATIONS

SECTION	TITLE
003126	Existing Hazardous Materials Information
003132	Geotechnical Data
003132	Geotechnical Report
011000	Summary
012000	Allowances
012300	Alternates
012500	Substitution Procedures
012600	Contract Modification Procedures
012900	Payment Procedures
013100	Project Management and Coordination
013200	Construction Progress Documentation
013300	Submittal Procedures
014000	Quality Requirements
015000	Temporary Facilities and Controls
017300	Execution
017419	Construction Waste Management and Disposal
017700	Closeout Procedures
107823	Operations and Maintenance Data
017839	Project Record Documents
017900	Demonstration and Training
024119	Selective Demolition
033000	Cast-In-Place Concrete
042000	Unit Masonry
055000	Metal Fabrications
061000	Rough Carpentry
071326	Self-Adhering Sheet Waterproofing
071700	Bentonite Waterproofing
075323	Ethylene-Propylene-Diene-Monomer (EPDM) Roofing

079200	Joint Sealants
099113	Exterior Painting
099123	Interior Painting
142400	Hydraulic Elevators
313116	Termite Control

**END OF SECTION**

**003126****EXISTING HAZARDOUS MATERIAL INFORMATION****1.1 EXISTING HAZARDOUS MATERIAL INFORMATION**

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.
- B. A hazardous material investigation report has not been completed due to the age of the existing elevator shaft. No hazardous materials are anticipated.

**END OF DOCUMENT**

**003132****GEOTECHNICAL DATA****1.1 GEOTECHNICAL DATA**

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.
- B. A geotechnical investigation report for Project, prepared by Froehling & Robertson, Inc., dated January 2013, follows this page.

**END OF DOCUMENT**



Report of Subsurface Exploration  
and Geotechnical Engineering Evaluation  
**Lynchburg City Armory Elevator Tower**  
Lynchburg, Virginia  
F&R Project No. 62P0419

Prepared For:  
**Master Engineers & Designers**  
904 Lakeside Drive  
Lynchburg, Virginia 24501

Prepared By:  
**Froehling & Robertson, Inc.**  
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Roanoke, Virginia 24012  
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January 2013



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**F&R Project No.: 62P0419**

22 January 2013

Master Engineers & Designers  
904 Lakeside Drive  
Lynchburg, Virginia 24501

Attention: Mr. Gary Loomis

Subject: Lynchburg City Armory Elevator Tower  
Lynchburg, Virginia

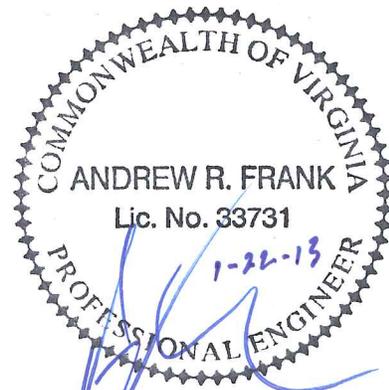
Mr. Loomis:

The purpose of this report is to present the results of the subsurface exploration program and geotechnical engineering analyses undertaken by Froehling & Robertson, Inc. (F&R) in connection with the above referenced project. Our services were performed in general accordance with F&R Proposal No. 1362-317G as well as subsequent extensions to perform two additional exploratory phases: 1) a test pit exploration utilizing a city-contracted mini-excavator and 2) an additional mechanized test boring using a small radio-controlled track mounted drilling rig dispatched from F&R's Richmond office. The attached report presents our understanding of the project, reviews our exploration procedures, describes existing site and general subsurface conditions, and presents our evaluations, conclusions, and recommendations.

We have enjoyed working with you on this project, and we are prepared to assist you with the recommended quality assurance monitoring and testing services during construction. Please contact us if you have any questions regarding this report or if we may be of further service.

Sincerely,  
**FROEHLING & ROBERTSON, INC.**

Ben W. Silcox, E.I.T.  
Staff Engineer



Andrew R. Frank, P.E.  
Senior Geotechnical Engineer

Distribution: Addressee (1 original/ 1 digital copy via e-mail: [gloomis@MasterEngineersInc.com](mailto:gloomis@MasterEngineersInc.com))  
Mr. Scott Glass, City of Lynchburg (1 digital copy via e-mail: [scott.glass@lynchburgva.gov](mailto:scott.glass@lynchburgva.gov))

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**TABLE OF CONTENTS**

<b><u>SECTION</u></b>	<b><u>PAGE</u></b>
EXECUTIVE SUMMARY .....	iii
<b>1.0 INTRODUCTION.....</b>	<b>1</b>
1.1 PROJECT INFORMATION .....	1
1.2 SCOPE OF SERVICES.....	1
<b>2.0 SUBSURFACE EXPLORATION PROCEDURES.....</b>	<b>3</b>
2.1 STANDARD PENETRATION TEST (SPT) BORINGS.....	3
2.2 HAND AUGER EXPLORATION .....	4
2.3 TEST PIT EXPLORATION .....	4
<b>3.0 SITE AND SUBSURFACE CONDITIONS .....</b>	<b>5</b>
3.1 SITE DESCRIPTION .....	5
3.2 REGIONAL GEOLOGY .....	5
3.3 SUBSURFACE CONDITIONS .....	6
3.3.1 General .....	6
3.3.2 Hand Auger Exploration Findings .....	6
3.3.3 Test Pit Exploration Findings.....	6
3.3.4 Standard Penetration Test (SPT) Boring Findings .....	6
3.4 LABORATORY TESTING PROGRAM .....	8
<b>4.0 CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>9</b>
4.1 GENERAL .....	9
4.2 FINDINGS AND CONCLUSIONS .....	9
4.3 POSSIBLE REMEDIAL APPLICATIONS .....	9
<b>5.0 CONTINUATION OF SERVICES .....</b>	<b>10</b>
<b>6.0 LIMITATIONS.....</b>	<b>11</b>

**APPENDICES**

**APPENDIX A**

ASFE Important Information About Your Geotechnical Engineering Report  
Site Vicinity Map (Drawing No. 1)

**APPENDIX B**

Classification of Soils for Engineering Purposes  
Key to Boring Log Soil Classification  
Soil Classification Chart  
Boring Location Plan (Drawing No. 2)  
Boring Logs (2)



## **EXECUTIVE SUMMARY**

This Executive Summary is provided as a brief overview of our geotechnical engineering evaluation for the project and is not intended to replace more detailed information contained elsewhere in this report. As an overview, this summary inherently omits details that could be very important to the proper application of the provided geotechnical design recommendations. This report should be read in its entirety prior to implementation into design and construction.

- The subsurface exploration program consisted of two test borings (designated as B-1 and B-2) and multiple hand auger borings as well as a test pit exploration. Site subsurface conditions generally consisted of existing fill materials underlain by alluvial soils, partially weathered rock, and auger refusal materials.
- Based on the results of our subsurface explorations as well as the reported structural load carried by the tower footings, we did not find conclusive evidence of an apparent geotechnical factor at the locations explored to explain the recent movement and resulting structural distress of the elevator tower.
- Laboratory testing of the near foundation bearing level soils from the test pit exploration revealed that at least some of the structure's supporting soils have a moderate to high shrink-swell potential. Therefore, it is possible that shrinkage of the foundation supporting soils (which would occur in times of drought) could be a contributory factor. However, we do not envision that this type of mechanism would be responsible for the large amount of tower movement recently observed.
- While our explorations were unable to find conclusive evidence of an apparent geotechnical factor for the tower's structural distress, we recognize that it may be desirable to try and push the tower closer to its original position as a part of a structural remedial approach for the project. We understand that underpinning of the existing foundation with helical piers is being considered as a possible remedial element and note that the soil conditions encountered in our explorations would appear generally conducive to helical pier installation, provided that the soil conditions are not deemed by the helical pier designers as too dense (or otherwise impenetrable) to facilitate adequate embedment.
- If utilized, the actual design and installation of the helical pier elements and underpinning system should be performed by a specialty contractor experienced with ground improvement and underpinning. The specialty contractor should make note of the gravel and brick debris within the existing fill materials as well as the potential for alluvial cobbles and boulders in the subsurface profile. While the alluvial materials encountered in the test borings appear generally suitable for helical pier installations, we note that alluvial deposits may be highly variable over short horizontal distances. If the specialty contractor is concerned that helical piers may be impeded, perhaps micro piles, which can typically drill through obstructions and/or in to otherwise dense subsurface materials, could be considered as an alternative.



## 1.0 INTRODUCTION

### 1.1 Project Information

Our understanding of the project is based on information provided by Mr. Gary Loomis of Master Engineers & Designers (Master Engineers) and Mr. Scott Glass of the City of Lynchburg, as well as our experience with similar projects. The project site is near the northwest corner of the existing Lynchburg City Armory building located at 1219 Main Street in Lynchburg, Virginia (see Site Vicinity Map, Drawing No. 1).

We understand that the elevator tower in this area is experiencing structural distress. From the exterior of the building, the structural distress is apparent in the form of cracking and separation of the brick veneer between the tower and the main building. Included in the provided information from Master Engineers was a partial set of structural and architectural drawings (filename: *Partial Drawings.pdf*) showing the elevator tower and foundations in both plan and section views.

Based on these drawings, the elevator tower is supported by a 3-foot wide shallow strip footing. While the tower's design bearing pressure is reportedly 1,500 pounds per square foot (psf), we understand that the actual bearing pressure applied to the tower footing (assuming it was constructed as drawn) is approximately 1,200 psf. Based on the provided architectural section, the main building's "Drill Floor" has an elevation of 633.19 feet and the lowest level "Sump Pit" of the adjacent elevator tower is about 4 feet below the Drill Floor level.

### 1.2 Scope of Services

The purposes of our involvement on the project were to 1) provide general descriptions of the encountered subsurface soil conditions, and 2) as applicable, provide comments on potential geotechnical factors associated with the observed structural distress as well as potential remedial approaches. In order to accomplish the above objectives, we undertook the following scope of services.

- 1) Visited the site to observe existing surface conditions and features and mark the boring locations.
- 2) Coordinated utility clearance with Miss Utility services as well as a private utility locator.
- 3) Reviewed and summarized readily available geologic information relative to the project site.
- 4) Executed an initial mechanized test boring subsurface exploration consisting of one standard penetration test boring drilled as close to the tower as accessible with our truck-mounted drill rig to an approximate depth of 40 feet.
- 5) Performed an initial hand auger exploration in an attempt to obtain subsurface information closer to the tower footings.
- 6) Performed a supplemental test pit exploration utilizing a city-contracted mini-excavator to assess the existing subsurface conditions adjacent the elevator foundation after repeated hand auger refusals were encountered during our initial exploratory phase.



- 7) Performed a follow-up mechanized test boring subsurface exploration consisting of one additional standard penetration test boring drilled adjacent to the tower's western corner using a small radio-controlled track mounted drilling rig dispatched from F&R's Richmond office.
- 8) Performed one soil classification (Atterberg limits and wash #200) test and one natural moisture content test.
- 9) Evaluated the findings of the subsurface explorations relative to the observed structural distress.
- 10) Prepared this written report summarizing our work on the project, providing descriptions of the subsurface conditions encountered, and, as applicable, providing comments on potential geotechnical factors associated with the observed structural distress as well as potential remedial applications. Copies of the test boring logs are included in Appendix B.

Our scope of services did not include a survey of boring locations and elevations, quantity estimates, preparation of plans or specifications, an evaluation of structural condition or integrity, evaluations of earthquake motions, or the identification and evaluation of environmental aspects of the site.



## 2.0 SUBSURFACE EXPLORATION PROCEDURES

### 2.1 Standard Penetration Test (SPT) Borings

Two SPT borings (designated as B-1 and B-2) were performed on 23 October and 8 December 2012, respectively, at the approximate locations shown on the attached Boring Location Plan (Drawing No. 2, Appendix B). Boring B-1 was performed with our truck-mounted drilling rig while boring B-2 was drilled with our smaller radio-controlled track mounted rig. The test boring locations were marked by F&R personnel at locations deemed accessible to our mechanized drilling equipment. Definitive ground surface elevations were not available at the time of this report; however, based on observations at the site, the boring elevations were estimated based on the provided building finished floor information. The attached Boring Location Plan consists of an overlay of the approximate boring locations on an available aerial photograph (photograph source: Google). In consideration of the methods used in their determination, as well as the base map's accuracy, the test boring locations shown on the attached Boring Location Plan should be considered approximate.

The test borings were performed in accordance with generally accepted practice using CME-55 rotary drill rigs. Hollow-stem augers were advanced to pre-selected depths, the center plug was removed, and representative soil samples were recovered with a standard split-spoon sampler (1 3/8 in. ID, 2 in. OD) in general accordance with ASTM D 1586, the Standard Penetration Test. Utilizing an automatic hammer, a weight of 140 pounds is freely dropped from a height of 30 inches to drive the split-spoon sampler into the soil. The number of blows required to drive the split-spoon sampler three consecutive 6-inch increments is recorded, and the blows of the last two increments are summed to obtain the Standard Penetration Resistance (N-value in blows per foot, bpf).

For boring B-2, the split-spoon was driven a fourth 6-inch increment in order to maintain continuous sampling of the soils in the upper 20 feet. However, as with the first "seating" increment, the final increment is not considered in the reporting of the Standard Penetration Resistance, i.e. a 24-inch sampler driven four consecutive 6-inch increments provides one N-value obtained from the sum of the second and third increments. The N-values provide a general indication of in-situ soil conditions and have been correlated with certain engineering properties of soils.

In some soils it is not always practical to drive a split-spoon sampler the full three consecutive 6-inch increments. Whenever more than 50 blows are required to drive the sampler over a 6-inch increment, or the sampler is observed not to penetrate after 50 blows, the condition is called split-spoon refusal. Split-spoon refusal conditions may occur because of obstructions or because the earth materials being tested are very dense or very hard. When split-spoon refusal occurs, often little or no sample is recovered. The SPT N-value for split-spoon refusal conditions is typically estimated as greater than 100 blows per foot (bpf). Where the sampler is observed not to penetrate after 50 blows, the N-value is reported as 50/0. Otherwise, the depth of penetration after 50 blows is reported in inches, i.e. 50/5, 50/2, etc. We typically refer to very dense residual soils with conceptualized N-values of greater than 100 bpf as Partially Weathered Rock (PWR).



Subsurface water level readings were taken in the borings immediately upon completion of the soil drilling process. Upon completion of drilling, the boreholes were backfilled with auger cuttings (soil) and, as applicable, the upper portion was capped with quick-setting concrete patch. Periodic observation and maintenance of the borehole should be performed due to potential subsidence at the ground surface, as the borehole backfill could settle over time.

Representative portions of the split-spoon soil samples obtained during the exploration program were placed in glass jars and were transported to our laboratory and evaluated by a member of our professional staff. In the laboratory, the soil samples were evaluated in general accordance with techniques outlined in the visual-manual identification procedure (ASTM D 2488) and the Unified Soil Classification System. The soil descriptions and classifications discussed in this report and shown on the attached boring logs are based on visual observation and should be considered approximate. Copies of the boring logs are provided and classification procedures are further explained in the attached Appendix B.

Split-spoon soil samples recovered on this project will be stored at F&R's office for a period of sixty days. After sixty days, the samples will be discarded unless prior notification is provided to us in writing.

## **2.2 Hand Auger Exploration**

Several hand augers were performed in an initial attempt to obtain subsurface information closer to the tower footings than could be attained with our mechanized equipment. This subsurface exploration program was also performed on 23 October 2012 and consisted of eight hand auger borings; four on either side of the elevator tower in the mulched areas. The hand auger borings were performed by manually rotating a sharpened, steel-bucket auger into the soil. Soil cuttings from the hand auger borings were observed and described by an F&R engineer in the field in general accordance with techniques outlined in the visual-manual identification procedure (ASTM D 2488) and the Unified Soil Classification System. These descriptions were generally based on visual field observation and therefore, the soil descriptions discussed in this report should be considered approximate.

## **2.3 Test Pit Exploration**

In consideration of the limited data obtained during the hand auger exploration, a test pit exploration was performed to further assess the existing conditions adjacent the elevator foundation. The test pit was performed adjacent the northeast side of the elevator by a subcontracted excavator utilizing a small track hoe. The test pit excavation was observed and the encountered subsurface conditions were documented in the field by a member of our professional staff.



### 3.0 SITE AND SUBSURFACE CONDITIONS

#### 3.1 Site Description

The project site is located near the west corner of the existing Lynchburg City Armory building located at 1219 Main Street in Lynchburg, Virginia. The elevator tower is bound by the Lynchburg City Armory building to the southeast, concrete steps and landings leading to Church Street to the northwest, and mulched areas to the southwest and northeast. In addition, a concrete sidewalk on the southwest side of the tower provides access from Church Street to an Armory entrance at this end of the building.

Definitive topographic information has not been provided at this time; however, based on the provided Armory Drill Floor elevation as well as observations and measurements made during our site visits, we have estimated that site grades fall from approximately 633 feet to 629 feet from southwest to northeast in the areas surrounding the elevator tower.

#### 3.2 Regional Geology

The site is located in the Western Piedmont physiographic province of Virginia. Available geologic references (Geologic Map and Structure Sections of the Lynchburg Quadrangle, Virginia, 1950) report that the site is underlain by Precambrian-aged rocks of the Lynchburg formation. Locally the Lynchburg formation is generally comprised of gray biotite-quartz gneiss, quartz-mica schist, and graphitic schist.

The residual soil profile generally grades downward gradually from fine-grained plastic soils near the ground surface to coarse-grained soils at greater depth. A transitional zone of partially weathered rock of varying thickness occurs between the coarse-grained residual soils and the underlying bedrock. Partially weathered rock is defined, for engineering purposes, as residual material with standard penetration resistances in excess of 100 blows per foot. Weathering of the parent bedrock is generally more rapid near fracture zones and therefore, the bedrock surface may be irregular. Irregular patterns of differential weathering may also result in zones of rock and partially weathered rock embedded within the more completely weathered coarse-grained soils.

We note that it is typical for the rock formations in the Lynchburg vicinity to be near-vertically oriented. The variation of weathering between adjacent near-vertically oriented rock layers can result in a variable bedrock surface that may fluctuate in composition or elevation within short lateral distances.

The project site lies adjacent to the James River. In this setting, alluvial materials consisting of cobbles, boulders and outwash material are typical. Furthermore, we note that the dynamic geologic processes resulting in the initial deposition of these alluvial soils also eroded the residual soils previously overlying the rock. Therefore, the contact between the alluvial soils and the underlying strata is expected to be highly variable over short horizontal distances, and may include areas of transported cobbles and boulders directly overlying residual soils and/or unweathered and partially weathered rock, adjacent to areas of finer-grained alluvial soils.



### **3.3 Subsurface Conditions**

#### **3.3.1 General**

As previously indicated, the exploration activities for this project were accomplished in the following three phases:

- 1) Executed an initial mechanized test boring exploration drilled as close to the tower as accessible with truck-mounted equipment combined with hand auger explorations closer to the tower footings.
- 2) Performed a supplemental test pit exploration to assess the existing subsurface conditions adjacent the elevator tower footings after repeated hand auger refusals were encountered during our initial exploratory phase.
- 3) Performed a follow-up mechanized test boring subsurface exploration consisting of one additional standard penetration test boring drilled adjacent to the tower's western corner using a small radio-controlled track mounted drilling rig dispatched from F&R's Richmond office.

The following sections present a summary of the conditions encountered during the initial hand auger exploration, subsequent test pit exploration as well as a more detailed description of the conditions encountered in the two mechanized test borings.

#### **3.3.2 Hand Auger Exploration Findings**

We note that the subsurface soil conditions encountered in the hand auger borings generally consisted of fill materials described as sandy silts (ML) with gravel and brick debris. Due to obstructions/debris within the fill materials, the hand auger borings were unable to penetrate to depths below the elevator tower's anticipated foundation bearing level.

#### **3.3.3 Test Pit Exploration Findings**

In general, the test pit encountered 2 to 4 inches of mulch and surficial soils underlain by existing fill materials. The encountered fill materials were generally described as stiff and very stiff sandy silts (ML) and clays (CH). Gravel, cobbles, and brick debris ranging in size from about 1 inch up to about 1 foot were encountered throughout test pit. The test pit was extended to a maximum depth of about 4 feet below the existing ground surface.

#### **3.3.4 Standard Penetration Test (SPT) Boring Findings**

##### **3.3.4.1 General**

The subsurface conditions discussed in the following paragraphs and those shown on the boring logs and composite subsurface profile represent an estimate of the subsurface conditions based on interpretation of the boring data using normally accepted geotechnical engineering judgments. The transitions between different soil strata are usually less distinct than those shown on the boring logs. Although individual test borings are representative of the subsurface conditions at the boring locations on the dates shown, they are not necessarily indicative of subsurface conditions at other locations or at other times. Data from the specific test borings are shown on the attached boring logs in Appendix B. Below the existing ground surface, the borings generally encountered surficial soils or concrete underlain by existing fill materials, alluvium, partially weathered rock, and auger refusal materials. These materials are generally discussed in the following paragraphs.



#### **3.3.4.2 Surficial Soils**

Surficial soils were encountered in boring B-1 to a depth of approximately 1 inch. Surficial soils are typically a dark-colored soil material containing roots, fibrous matter, and/or other organic components, and are generally unsuitable for engineering purposes. We note that no laboratory testing has been performed to determine the organic content or horticultural properties of the observed surficial soil materials. Therefore, the term “surficial soils” is not intended to indicate suitability for landscaping and/or other purposes. The surficial soil depths provided in this report are based on driller observations and should be considered approximate. Actual surficial soil depths should be expected to vary across the site.

#### **3.3.4.3 Concrete**

A concrete sidewalk slab was encountered at boring B-2 and was observed to be approximately 5 inches thick. The actual depths of concrete may vary in unexplored areas of the site. The concrete slab at the boring location was underlain directly by existing fill soils described as silt (ML).

#### **3.3.4.4 Existing Fill Materials**

Existing fill materials include those materials deposited by man. Materials identified as existing fill were encountered in each of the borings and extended to depths ranging from approximately 8 feet to 12 feet below the existing ground surface. The fill soils generally consisted of silts (ML), clays (CH), and silty sands (SM). Standard penetration resistance in the sampled fill ranged from 5 to 13 blows per foot (bpf).

#### **3.3.4.5 Alluvium**

Alluvium consists of materials that have been transported and deposited by flowing waters. Alluvial materials were encountered in each of the borings below the fill materials and extended to an approximate depth of 32 feet below the existing ground surface. Sampled alluvial materials were generally described as silts (MH), clays (CL), and silty sands and gravels (SM and GM) with standard penetration resistances (N-values) ranging from 9 to 41 blows per foot (bpf) and a typical range of 9 to 11 bpf.

#### **3.3.4.6 Partially Weathered Rock**

Partially weathered rock (PWR) is a transitional material between soil and rock, which retains the relic structure of the rock and has very hard or very dense consistencies. PWR was encountered in each of the borings at a depth of approximately 32 feet. The sampled PWR was described as very dense silty sand (SM) with penetration resistances ranging from of 50 blows per 3 inches (50/3) to 50 blows per 1 inch (50/1) of split-spoon penetration.

#### **3.3.4.7 Auger Refusal**

Auger refusal occurs when materials are encountered that cannot be penetrated by the soil auger and is normally indicative of a hard or very dense material, such as debris within fill, boulders, rock lenses, pinnacles, or the upper surface of bedrock. Refusal was encountered in boring B-1 at a depth of approximately 40 feet below existing site grade. Auger refusal



discussed herein is based on conditions impenetrable to our drilling equipment (CME-55 rotary drill rig). Auger refusal conditions with a CME-55 do not necessarily indicate conditions impenetrable to other equipment. Auger refusal conditions may exist intermediate of the boring locations or in unexplored areas of the site.

**3.3.4.8 Subsurface Water**

Subsurface water for the purposes of this report is defined as water encountered below the existing ground surface. Measurable subsurface water was encountered in borings B-1 at a depth of approximately 36 feet immediately upon completion of the soil drilling process. Fluctuations in subsurface water levels and soil moisture can be anticipated with changes in precipitation, run-off, and season.

**3.4 Laboratory Testing Program**

A soil sample obtained near the foundation bearing level during the test pit exploration was tested in general accordance with applicable ASTM International standards for moisture content (ASTM D 2216), Atterberg limits (ASTM D 4318), and percent passing #200 sieve (ASTM D 1140). The results of the laboratory tests are summarized in the following table.

**Soil Classification Test Summary**

Location	Sample Depth (feet)	Moisture Content (%)	% Finer than No. 200	Atterberg Limits			USCS Classification
				L.L.	P.L.	P.I.	
TP-1	2.5	25.7	81.6	60	25	35	fat CLAY (CH) with sand



## **4.0 CONCLUSIONS AND RECOMMENDATIONS**

### **4.1 General**

The following evaluations and recommendations are based on our observations at the site, interpretation of the field and laboratory data obtained during our explorations, and our experience with similar subsurface conditions and projects. Subsurface conditions in unexplored locations may vary from those encountered.

### **4.2 Findings and Conclusions**

Based on the results of our subsurface explorations as well as the reported structural load carried by the tower footings, we did not find conclusive evidence of an apparent geotechnical factor at the locations explored to explain the recent movement and resulting structural distress of the elevator tower. We note that based on the laboratory testing of the near foundation bearing level soils from the test pit exploration, at least some of the structure's supporting soils have a moderate to high shrink-swell potential. Therefore, it is possible that shrinkage of the foundation supporting soils (which would occur in times of drought) could be a contributory factor. However, we do not envision that this type of mechanism would be responsible for the large amount of tower movement recently observed.

### **4.3 Possible Remedial Applications**

While our explorations were unable to find conclusive evidence of an apparent geotechnical factor for the tower's structural distress, we recognize that it may be desirable to try and push the tower closer to its original position as a part of a structural remedial approach for the project. We understand that underpinning of the existing foundation with helical piers is being considered as a possible remedial element and note that the soil conditions encountered in our explorations would appear generally conducive to helical pier installation, provided that the soil conditions are not deemed by the helical pier designers as too dense (or otherwise impenetrable) to facilitate adequate embedment.

If utilized, the actual design and installation of the helical pier elements and underpinning system should be performed by a specialty contractor experienced with ground improvement and underpinning. The specialty contractor should make note of the gravel and brick debris within the existing fill materials as well as the potential for alluvial cobbles and boulders in the subsurface profile. While the alluvial materials encountered in the test borings appear generally suitable for helical pier installations, we note that alluvial deposits may be highly variable over short horizontal distances. If the specialty contractor is concerned that helical piers may be impeded, perhaps micro piles, which can typically drill through obstructions and/or in to otherwise dense subsurface materials, could be considered as an alternative.



## 5.0 CONTINUATION OF SERVICES

We recommend that Froehling & Robertson, Inc. be retained for professional and construction testing as well as helical pier installation monitoring services during the underpinning installation. Our continued involvement on the project helps provide continuity for proper implementation of the recommendations discussed herein. These services are not part of the currently authorized scope of services.



## 6.0 LIMITATIONS

This report has been prepared for the exclusive use of Master Engineers & Designers or their agent, for specific application to the Lynchburg City Armory Elevator Tower project, in accordance with generally accepted soil and foundation engineering practices. No other warranty, express or implied, is made. Our conclusions and recommendations are based on design information furnished to us, the data obtained from the previously described subsurface exploration program, and generally accepted geotechnical engineering practice. The conclusions and recommendations do not reflect variations in subsurface conditions which could exist intermediate of the boring locations or in unexplored areas of the site. Should such variations become apparent during construction, it will be necessary to re-evaluate our conclusions and recommendations based upon on-site observations of the conditions.

Regardless of the thoroughness of a subsurface exploration, there is the possibility that conditions between borings will differ from those at the boring locations, that conditions are not as anticipated by the designers, or that the construction process has altered the soil conditions. Therefore, experienced geotechnical engineers should evaluate earthwork, pavement, and foundation construction to verify that the conditions anticipated in design actually exist. Otherwise, we assume no responsibility for construction compliance with the design concepts, specifications, or recommendations.

In the event that changes are made in the design or location of the proposed structures, the recommendations presented in the report shall not be considered valid unless the changes are reviewed by our firm and conclusions of this report modified and/or verified in writing. If this report is copied or transmitted to a third party, it must be copied or transmitted in its entirety, including text, attachments, and enclosures. Interpretations based on only a part of this report may not be valid. This report contains 11 pages of text and the attached appendices.

## **APPENDIX A**

# Important Information About Your Geotechnical Engineering Report

*Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.*

*The following information is provided to help you manage your risks.*

## Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply the report for any purpose or project except the one originally contemplated.*

## Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

## A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

## Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

## Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

## A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

## A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

## Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

## Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

## Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that

have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

## Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

## Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

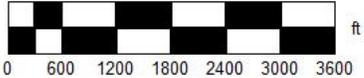
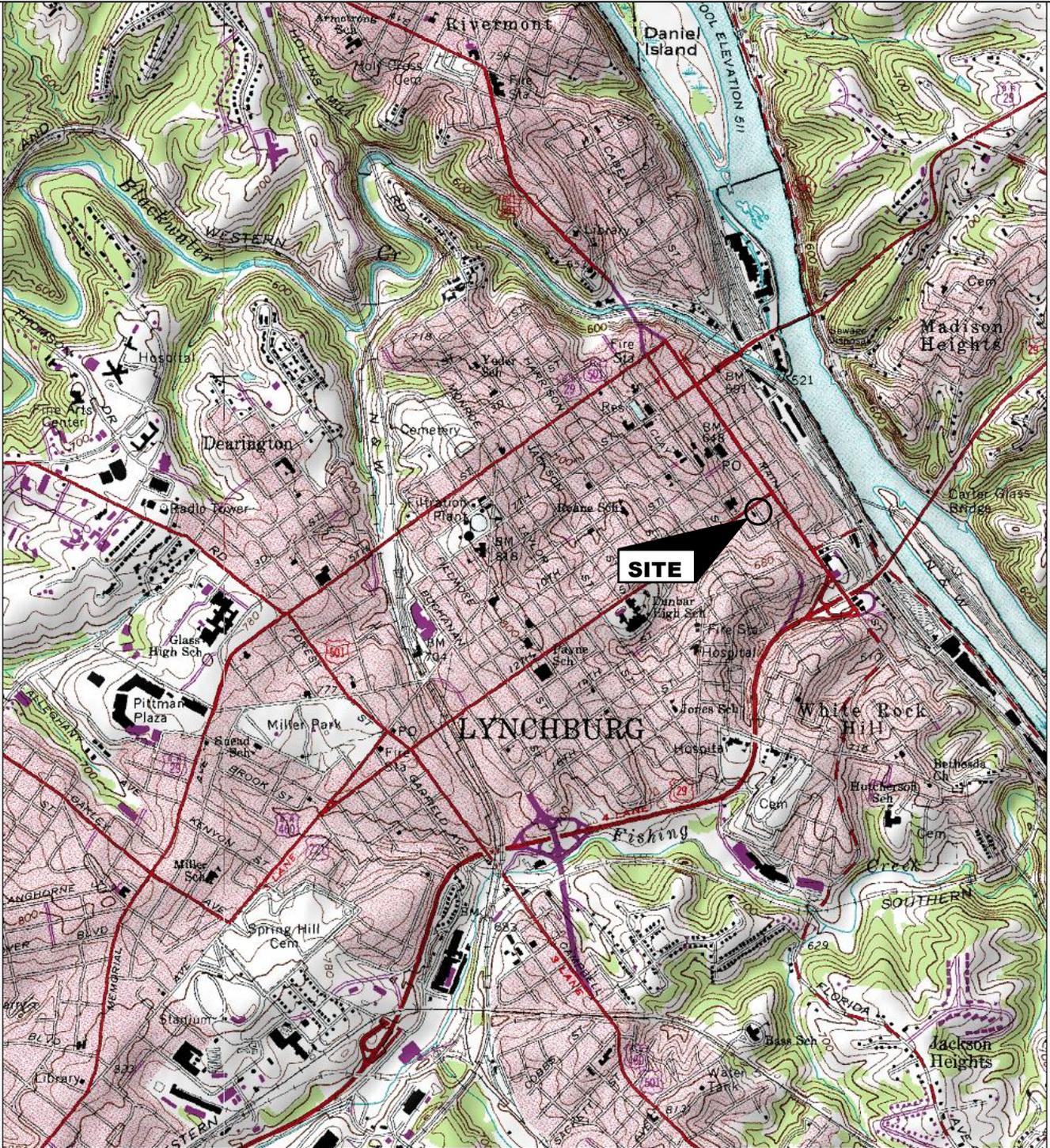
## Rely on Your ASFE-Member Geotechnical Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.



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Adapted from the USGS 7.5 minute series topographic quadrangle, Lynchburg, VA (1984)



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**DATE:** January 2013

**SCALE:** As Shown

**DRAWN:** JRD 62P0419

Master Engineers & Designers  
Lynchburg City Armory Elevator Tower  
Lynchburg, Virginia

SITE  
VICINITY  
MAP

**DRAWING NO.**  
1

## **APPENDIX B**

<b>CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES.</b> ASTM Designation: D 2487 (Based on Unified Soil Classification System)	<b>SOIL ENGINEERING</b>
---	-------------------------

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests <sup>A</sup>				Soil Classification		
				Group Symbol	Group Name <sup>B</sup>	
<b>COARSE-GRAINED SOILS</b> More than 50% retained on No. 200 sieve	Gravels More than 50% coarse fraction retaining on No. 4 sieve	Clean Gravels Less than 5% fines <sup>C</sup>	$Cu \geq 4$ and $1 \leq Cc \leq 3$ <sup>E</sup> $Cu < 4$ and/or $1 > Cc > 3$ <sup>E</sup>	GW	Well graded gravel <sup>F</sup>	
		Gravels with Fines More than 12% fines <sup>C</sup>	Fines classify as ML or MH Fines classify as CL or CH	GM	Silty gravel <sup>F,GH</sup>	
		Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines <sup>D</sup>	$Cu \geq 6$ and $1 \leq Cc \leq 3$ <sup>E</sup> $Cu < 6$ and/or $1 > Cc > 3$ <sup>E</sup>	SW	Well-graded sand <sup>I</sup>
			Sands with Fines, More than 12% fines <sup>D</sup>	Fines classify as ML or MH Fines classify as CL or CH	SP	Poorly graded sand <sup>I</sup>
	<b>FINE-GRAINED SOILS</b> 50% or more passes the No. 200 sieve	Silts and Clays Liquid Limit less than 50	Inorganic	$PI > 7$ and plots on or above "A" line <sup>I</sup>	CL	Lean clay <sup>K,LM</sup>
				$PI < 4$ or plots below "A" line <sup>I</sup>	ML	Silt <sup>K,LM</sup>
			Organic	$\frac{\text{Liquid limit-oven dried}}{\text{Liquid limit-not dried}} < 0.75$	OL	Organic clay <sup>K,LM,N</sup>
				$\frac{\text{Liquid limit-oven dried}}{\text{Liquid limit-not dried}} < 0.75$	OH	Organic silt <sup>K,LM,O</sup>
Silts and Clays Liquid limit 50 or more		Inorganic	$PI$ plots on or above "A" line	CH	Fat clay <sup>K,LM</sup>	
			$PI$ plots below "A" line	MH	Elastic silt <sup>K,LM</sup>	
		Organic	$\frac{\text{Liquid limit-oven dried}}{\text{Liquid limit-not dried}} < 0.75$	OH	Organic clay <sup>K,LM,P</sup>	
			$\frac{\text{Liquid limit-oven dried}}{\text{Liquid limit-not dried}} < 0.75$	OH	Organic silt <sup>K,LM,Q</sup>	
<b>HIGHLY ORGANIC SOILS</b> Primarily organic matter, dark in color, and organic odor				PT	Peat	

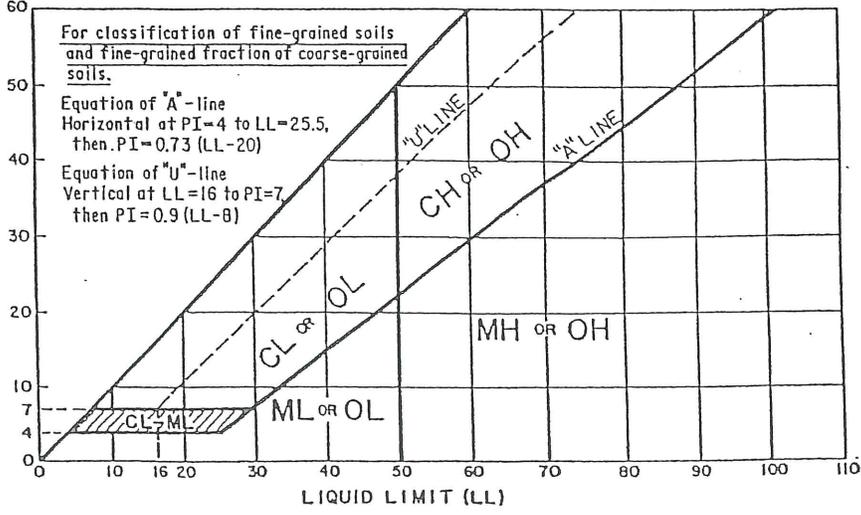
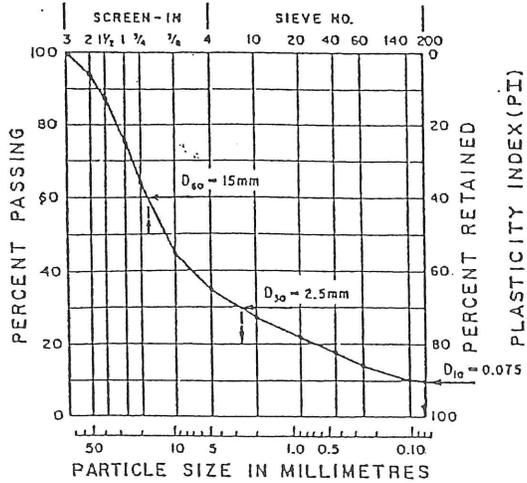
<sup>A</sup>Based on the material passing the 3-in. (75-mm) sieve  
<sup>B</sup>If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.  
<sup>C</sup>Gravels with 5 to 12% fines require dual symbols:  
 GW-GM well-graded gravel with silt  
 GW-GC well-graded gravel with clay  
 GP-GM poorly graded gravel with silt  
 GP-GC poorly graded gravel with clay  
<sup>D</sup>Sands with 5 to 12% fines require dual symbols:  
 SW-SM well-graded sand with silt  
 SW-SC well-graded sand with clay  
 SP-SM poorly graded sand with silt  
 SP-SC poorly graded sand with clay

$$E \quad Cu = D_{60}/D_{10}, \quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$$

<sup>F</sup>If soil contains  $\geq 15\%$  sand, add "with sand" to group name.  
<sup>G</sup>If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.  
<sup>H</sup>If fines are organic, add "with organic fines" to group name.  
<sup>I</sup>If soil contains  $\geq 15\%$  gravel, add "with gravel" to group name.

<sup>J</sup>If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay.  
<sup>K</sup>If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.  
<sup>L</sup>If soil contains  $\geq 30\%$  plus No. 200, predominantly sand, add "sandy" to group name.  
<sup>M</sup>If soil contains  $\geq 30\%$  plus No. 200, predominantly gravel, add "gravelly" to group name.  
<sup>N</sup> $PI \geq 4$  and plots on or above "A" line.  
<sup>O</sup> $PI < 4$  or plots below "A" line.  
<sup>P</sup> $PI$  plots on or above "A" line.  
<sup>Q</sup> $PI$  plots below "A" line.

**SIEVE ANALYSIS**





## KEY TO BORING LOG SOIL CLASSIFICATION

### Particle Size and Proportion

Visual descriptions are assigned to each soil sample or stratum based on estimates of the particle size of each component of the soil and the percentage of each component of the soil.

Particle Size		Proportion				
Descriptive Terms		Descriptive Terms				
Soil Component	Particle Size	Component	Term	Percentage		
Boulder	> 12 inch	Major	Uppercase Letters (e.g., SAND, CLAY)	> 50%		
Cobble	3 - 12 inch					
Gravel-Coarse	3/4 - 3 inch	Secondary	Adjective (e.g., sandy, clayey)	25% - 50%		
-Fine	#4 - 3/4 inch					
Sand-Coarse	#10 - #4					
-Medium	#40 - #10	Minor	Some	15% - 25%		
-Fine	#200 - #40					
Silt (non-cohesive)	< #200				Little	5% - 15%
Clay (cohesive)	< #200				Trace	0% - 5%

Notes:

- Particle size is designated by U.S. Standard Sieve Sizes
- Because of the small size of the split-spoon sampler relative to the size of gravel, the true percentage of gravel may not be accurately estimated.

### Density or Consistency

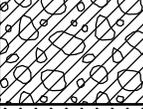
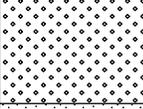
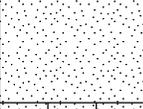
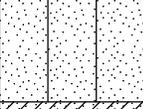
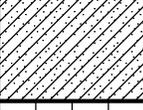
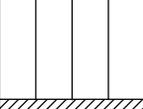
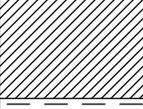
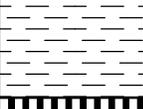
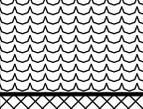
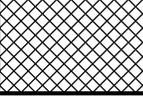
The standard penetration resistance values (N-values) are used to describe the density of coarse-grained soils (GRAVEL, SAND) or the consistency of fine-grained soils (SILT, CLAY). Sandy silts of very low plasticity may be assigned a density instead of a consistency.

DENSITY		CONSISTENCY	
Term	N-Value	Term	N-Value
Very Loose	0 - 4	Very Soft	0 - 1
Loose	5 - 10	Soft	2 - 4
Medium Dense	11 - 30	Medium Stiff	5 - 8
Dense	31 - 50	Stiff	9 - 15
Very Dense	> 50	Very Stiff	16 - 30
		Hard	> 30

Notes:

- The N-value is the number of blows of a 140 lb. Hammer freely falling 30 inches required to drive a standard split-spoon sampler (2.0 in. O.D., 1-3/8 in. I.D.) 12 inches into the soil after properly seating the sampler 6 inches.
- When encountered, gravel may increase the N-value of the standard penetration test and may not accurately represent the in-situ density or consistency of the soil sampled.

# SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS			
			GRAPH	LETTER				
<p><b>COARSE GRAINED SOILS</b></p> <p>MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE</p>	<p><b>GRAVEL AND GRAVELLY SOILS</b></p> <p>(LITTLE OR NO FINES)</p>	CLEAN GRAVELS		<b>GW</b>	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES			
		GRAVELS WITH FINES		<b>GP</b>	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES			
		(APPRECIABLE AMOUNT OF FINES)		<b>GM</b>	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES			
		(APPRECIABLE AMOUNT OF FINES)		<b>GC</b>	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES			
	<p><b>SAND AND SANDY SOILS</b></p> <p>MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE</p>	<p>CLEAN SANDS</p> <p>(LITTLE OR NO FINES)</p>	CLEAN SANDS		<b>SW</b>	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES		
			(LITTLE OR NO FINES)		<b>SP</b>	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES		
		<p>SANDS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>	SANDS WITH FINES		<b>SM</b>	SILTY SANDS, SAND - SILT MIXTURES		
			(APPRECIABLE AMOUNT OF FINES)		<b>SC</b>	CLAYEY SANDS, SAND - CLAY MIXTURES		
			<p><b>FINE GRAINED SOILS</b></p> <p>MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE</p>	<p><b>SILTS AND CLAYS</b></p> <p>LIQUID LIMIT LESS THAN 50</p>	(LITTLE OR NO FINES)		<b>ML</b>	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
					(LITTLE OR NO FINES)		<b>CL</b>	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
(LITTLE OR NO FINES)		<b>OL</b>			ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY			
<p><b>SILTS AND CLAYS</b></p> <p>LIQUID LIMIT GREATER THAN 50</p>	<p>LIQUID LIMIT GREATER THAN 50</p>	(LITTLE OR NO FINES)		<b>MH</b>	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS			
		(LITTLE OR NO FINES)		<b>CH</b>	INORGANIC CLAYS OF HIGH PLASTICITY			
		(LITTLE OR NO FINES)		<b>OH</b>	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS			
EXISTING FILL				<b>FILL</b>	EXISTING FILL MATERIALS			

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS



Source of aerial photograph: *Google*



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**DATE:** January 2013

**SCALE:** Not to Scale

**DRAWN:** BWS 62P0419

Master Engineers & Designers  
 Lynchburg City Armory Elevator Tower  
 Lynchburg, Virginia

BORING  
 LOCATION  
 PLAN

**DRAWING NO.**  
 2



**Project No:** 62P0419

**Elevation:** ~633'

**Drilling Method:** 2.25" ID HSA

**Client:** Master Engineers & Designers

**Total Depth:** 40.0'

**Hammer Type:** Automatic

**Project:** Lynchburg Armory Elevator Tower

**Boring Location:** See Boring Location Plan

**Date Drilled:** 10/23/12

**City/State:** Lynchburg, VA

**Driller:** W. Wilson (Truck)

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks
0.0	0.1	Surficial soil				Subsurface water was encountered at a depth of approximately 36 feet immediately upon completion of drilling.
		<b>FILL:</b> Sampled as stiff, brown and orange brown, moist, fine to coarse sandy SILT (ML) with little fine to medium gravel and trace root matter	5-5-7	1.0	12	
				2.5		
			2-3-9	3.5		
				5.0	12	
0.0	6.0	Sampled as loose, brown and orange brown, moist, silty fine SAND (SM) with little medium gravel	2-3-4	6.0	7	
0.0	8.0	Sampled as loose, red brown and brown, moist, silty fine to coarse SAND (SM) with some fine to coarse gravel	2-2-3	8.5	5	
				10.0		
0.0	12.0	<b>ALLUVIUM:</b> Stiff, red brown, moist, silty CLAY (CL) with trace fine sand				
			2-4-5	13.5	9	
				15.0		
0.0	17.0	Stiff, light brown, moist, fine sandy CLAY (CL)				
			4-5-8	18.5	13	
				20.0		
			5-5-5	23.5		
				25.0		
0.0	27.0	Dense, tan, moist, sandy fine to coarse rounded to sub-rounded GRAVEL (GM) with some silt				
			16-12-29	28.5	41	
				30.0		
0.0	32.0	<b>PARTIALLY WEATHERED ROCK:</b> Sampled as very dense, brown, moist to wet, silty fine SAND (SM)				
			50/1	33.5	100+	
				38.5		
			50/1			
0.0	40.0	Auger refusal at 40 feet				Driller noted mostly rocky drilling from 29 feet to 40 feet.

BORING LOG 62P-0419.GPJ F&R.GDT 1/22/13

\*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N-Value.



**Project No:** 62P0419

**Elevation:** ~630'

**Drilling Method:** 2.25" ID HSA

**Client:** Master Engineers & Designers

**Total Depth:** 38.5'

**Hammer Type:** Automatic

**Project:** Lynchburg Armory Elevator Tower

**Boring Location:** See Boring Location Plan

**Date Drilled:** 12/8/12

**City/State:** Lynchburg, VA

**Driller:** C. Ellis (Radio Track)

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks
0.0	0.4	5" Concrete	3-4-4	0.5		Subsurface water was not encountered immediately upon completion of drilling.
0.0	2.0	<b>FILL:</b> Sampled as medium stiff, brown, moist, SILT (ML) with some fine to coarse sand and trace fine gravel	6-6-7 -8	2.0	8	
		Sampled as stiff and medium stiff, orange brown and red brown, moist, CLAY (CH) with little to some fine to coarse sand	3-4-4 -6	4.0	13	
		-with some concrete debris from 6 to 7 feet	2-7-4 -3	6.0	8	
0.0	8.0	<b>ALLUVIUM:</b> Stiff, red brown, moist, silty CLAY (CL) with trace fine rounded gravel	3-3-6 -8	8.0	11	
			4-4-7 -7	10.0	9	
0.0	12.0	Stiff, orange brown, moist, SILT (MH) with some fine sand	4-4-6 -8	12.0	11	
0.0	14.0	Medium dense, orange brown, moist, silty fine SAND (SM)	3-5-6 -6	14.0	10	
0.0	16.0	Stiff, orange brown, moist, fine sandy SILT (MH) with trace fine rounded gravel	4-4-6 -7	16.0	11	
			3-3-6 -7	18.0	10	
				20.0	9	
0.0	22.0	Loose, orange brown and tan, moist, silty fine SAND (SM)	3-4-5 -7	22.0	9	
				23.0		
				25.0		
0.0	27.0	Medium dense, brown and tan, moist, silty fine to coarse SAND (SM) with some fine to coarse rounded gravel	11-18-11 -9	27.0	29	
				28.0		Driller noted mostly rocky drilling from 27 feet to 38 feet.
				30.0		
0.0	32.0	<b>PARTIALLY WEATHERED ROCK:</b> Sampled as very dense, brown and orange brown, moist, silty fine to medium SAND (SM)	50/3	32.0	100+	
0.0	38.5	-no split-spoon recovery at 38 feet Boring terminated at 38.5 feet	50/1	38.0	100+	

BORING LOG 62P-0419.GPJ F&R.GDT 1/22/13

\*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N-Value.



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**011000****SUMMARY****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section Includes:

- 1. Project information.
- 2. Work covered by Contract Documents.
- 3. Phased construction.
- 4. Access to site.
- 5. Work restrictions.
- 6. Specification and drawing conventions.

- B. Related Requirements:

- 1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

**1.3 PROJECT INFORMATION**

- A. Project Identification: Lynchburg City Armory Elevator Replacement

- 1. Project Location: 1210 Church Street, Lynchburg, VA 24504.

- B. Owner: City of Lynchburg.

- 1. Owner's Representative: Scott Glass, Facilities Manager, 434-455-4409.

- C. Engineer: Master Engineers & Designers Inc.

- D. Architect: Dominion Seven Architects, PLLC.

**1.4 DESIGN TEAM POINT OF CONTACT**

- A. All questions by the Contractor shall be directed to:

- 1. Gary Loomis, Master Engineers & Designers, 434-846-1350.

## 1.5 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Description: Project consists of the removal of the existing elevator shaft and related equipment and systems located on the west side of the building, due to foundation settling issues. A new elevator shaft with new elevator equipment will be installed. The project includes concrete foundations, masonry walls, EPDM roofing, elevator equipment and miscellaneous mechanical and electrical work. The project also includes exterior sidewalk demolition and reconstruction.

Note that after the existing elevator shaft has been demolished, special inspections will be performed on the existing subgrade. If unacceptable conditions exist, changes to the design of the foundation may occur. Any modifications required to the foundation design shown in the Contract Documents will be executed through a change order process.

- B. Type of Contract:
1. Project will be constructed under a single prime contract.

## 1.6 ACCESS TO SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. The Owner will fully occupy the building during construction. However the sidewalk between the Main Street parking lot and Church Street will be closed during construction.
- B. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

## 1.7 WORK RESTRICTIONS

- A. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, unless otherwise indicated.
1. Weekend Hours: As coordinated with the Owner.
  2. Early Morning Hours: As coordinated with the Owner.
  3. Hours for Utility Shutdowns: As coordinated with the Owner.
- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
1. Notify Owner not less than three days in advance of proposed utility interruptions.
- C. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
1. Notify Owner not less than three days in advance of proposed disruptive operations.

- D. Tobacco Use: There will be no smoking inside the existing building.
- E. Controlled Substances: Use of controlled substances on City of Lynchburg properties is not permitted.

## 1.8 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
  - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. The successful Contractor shall be responsible for including all items, indicated in the Contract Documents. If an item is called for on the Drawings, and not specifically designated to a particular Specification section, the Contractor shall determine by whom it shall be provided as part of the Contract amount. The Architect and Owner will not arbitrate differences and responsibilities between Contractor and Subcontractor.
- C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- D. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
  - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
  - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.
- E. Contract Document Inconsistencies: In the event of inconsistencies, discrepancies, omissions, ambiguities or conflicts within or between parts of the Contract Documents or between the Contract Documents and applicable standards, codes, rules, regulations and ordinances, the Contractor will be bound by the more restrictive requirement and or will be bound to provide the more expensive or better quality materials or equipment.

## 1.10 EXAMINATION OF THE SITE

- A. Bidders are required to visit the Project site, compare the drawings and specifications with existing conditions, and inform themselves of all conditions. Failure to visit the site and examine the existing conditions in relation to the work to be performed will in

no way relieve the Contractor from necessity of furnishing any materials or performing any work that may be required to complete work in accordance with drawings and specifications without any additional cost to the Owner. The Contractor will be responsible for demolition of all existing utilities and site elements necessary to provide finish product as indicated by the Contract Documents.

- B. The locations of underground utilities serving the site are not shown and have not been independently verified by the Owner. The Contractor shall determine the exact location of all utilities before commencing work, and agrees to be fully responsible for any and all damages which might be occasioned by the Contractor's failure to exactly locate and preserve any and all underground utilities.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

END OF SECTION

**012000****ALLOWANCES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements governing allowances.
  - 1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.
- B. Types of allowances include the following:
  - 1. Unit-cost allowances.

**1.3 SELECTION AND PURCHASE**

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

**1.4 ACTION SUBMITTALS**

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

**1.5 INFORMATIONAL SUBMITTALS**

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

- B. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

## **1.6 COORDINATION**

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

## **1.7 UNIT-COST AND LUMP SUM ALLOWANCES**

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
  - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

## **1.8 ADJUSTMENT OF ALLOWANCES**

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
  - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
  - 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
  - 3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
  - 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
  - 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
  - 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

## **PART 2 - PRODUCTS (Not Used)**

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

### **3.2 PREPARATION**

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

### **3.3 SCHEDULE OF ALLOWANCES**

- A. Allowance No. 1: Unit-Cost Allowance: Include the sum of \$400.00 per thousand for face brick as specified in Section 042000 "Unit Masonry" and as shown on Drawings.

**END OF SECTION**

**012300****ALTERNATES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for alternates.

**1.3 DEFINITIONS**

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
  - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
  - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

**1.4 PROCEDURES**

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
  - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.

- D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

## **PART 2 - PRODUCTS (Not Used)**

## **PART 3 - EXECUTION**

### **3.1 SCHEDULE OF ALTERNATES**

- A. Alternate No. 1.
1. Over excavate the footing to a depth of 3 feet and backfill with stone. The mat foundation will be placed on the control backfill. Refer to the Drawings for details.
- B. Alternate No. 2.
1. Install helical pile foundations. The mat foundation will be placed on the piles. Refer to the Drawings for details.

**END OF SECTION**

**012500****SUBSTITUTION PROCEDURES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
  - 1. Section 012000 "Allowances" for products selected under an allowance.
  - 2. Section 012300 "Alternates" for products selected under an alternate.

**1.3 DEFINITIONS**

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
  - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
  - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

**1.4 ACTION SUBMITTALS**

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Substitution Request Form: Use facsimile of form provided in Project Manual.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.

- b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
  - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
  - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
  - e. Samples, where applicable or requested.
  - f. Certificates and qualification data, where applicable or requested.
  - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
  - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
  - i. Research reports evidencing compliance with building code in effect for Project.
  - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
  - k. Cost information, including a proposal of change, if any, in the Contract Sum.
  - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
  - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within fourteen days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
  - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

## 1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

## 1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

## PART 2 - PRODUCTS

### 2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than fourteen days prior to time required for preparation and review of related submittals.
  - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
    - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    - b. Requested substitution provides sustainable design characteristics that specified product provided.
    - c. Substitution request is fully documented and properly submitted.
    - d. Requested substitution will not adversely affect Contractor's construction schedule.
    - e. Requested substitution has received necessary approvals of authorities having jurisdiction.
    - f. Requested substitution is compatible with other portions of the Work.
    - g. Requested substitution has been coordinated with other portions of the Work.
    - h. Requested substitution provides specified warranty.
    - i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within sixty days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Architect.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
  - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
  - b. Requested substitution does not require extensive revisions to the Contract Documents.
  - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  - d. Requested substitution provides sustainable design characteristics that specified product provided.
  - e. Substitution request is fully documented and properly submitted.
  - f. Requested substitution will not adversely affect Contractor's construction schedule.
  - g. Requested substitution has received necessary approvals of authorities having jurisdiction.
  - h. Requested substitution is compatible with other portions of the Work.
  - i. Requested substitution has been coordinated with other portions of the Work.
  - j. Requested substitution provides specified warranty.
  - k. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

### **PART 3 - EXECUTION (Not Used)**

**END OF SECTION**

**012600****CONTRACT MODIFICATION PROCEDURES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
  - 1. Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

**1.3 MINOR CHANGES IN THE WORK**

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

**1.4 PROPOSAL REQUESTS**

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
  - 2. Within 10 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include costs of labor and supervision directly attributable to the change.

- d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
  - e. Quotation Form: Use forms acceptable to Architect.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
  2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
  3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
  4. Include costs of labor and supervision directly attributable to the change.
  5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
  6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
  7. Proposal Request Form: Use form acceptable to Architect.

## **1.5 ADMINISTRATIVE CHANGE ORDERS**

- A. Allowance Adjustment: See Section 012100 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.

## **1.6 CHANGE ORDER PROCEDURES**

- A. On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

## **1.7 CONSTRUCTION CHANGE DIRECTIVE**

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
  - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

**END OF SECTION**

**012900****PAYMENT PROCEDURES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
  - 1. Section 012000 "Allowances" and for procedural requirements governing the handling and processing of allowances.
  - 2. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
  - 3. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

**1.3 DEFINITIONS**

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

**1.4 SCHEDULE OF VALUES**

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
  - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
    - a. Application for Payment forms with continuation sheets.
    - b. Submittal schedule.
    - c. Items required to be indicated as separate activities in Contractor's construction schedule.

2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the schedule of values:
    - a. Project name and location.
    - b. Name of Architect.
    - c. Architect's project number.
    - d. Contractor's name and address.
    - e. Date of submittal.
  2. Arrange schedule of values consistent with format of AIA Document G703.
  3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
    - a. Related Specification Section or Division.
    - b. Description of the Work.
    - c. Name of subcontractor.
    - d. Name of manufacturer or fabricator.
    - e. Name of supplier.
    - f. Change Orders (numbers) that affect value.
    - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
      - 1) Labor.
      - 2) Materials.
      - 3) Equipment.
  4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
  5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
  6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
    - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
  7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

8. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
9. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
  - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
10. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

## 1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
  1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
  1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
  2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
  3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
  4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
  2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
  3. Provide summary documentation for stored materials indicating the following:
    - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
    - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
    - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- F. Transmittal: Submit four signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
  2. When an application shows completion of an item, submit conditional final or full waivers.
  3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
  4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
  2. Schedule of values.
  3. Contractor's construction schedule (preliminary if not final).
  4. Products list (preliminary if not final).
  5. Schedule of unit prices.
  6. Submittal schedule (preliminary if not final).
  7. List of Contractor's staff assignments.
  8. Copies of building permits.
  9. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
  10. Initial progress report.
  11. Report of preconstruction conference.
  12. Certificates of insurance and insurance policies.
  13. Performance and payment bonds.

- I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
  1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
  2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
  
- J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
  1. Evidence of completion of Project closeout requirements.
  2. Updated final statement, accounting for final changes to the Contract Sum.
  3. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
  4. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
  5. AIA Document G707, "Consent of Surety to Final Payment."
  6. Evidence that claims have been settled.
  7. Final liquidated damages settlement statement.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

**END OF SECTION**

**013100****PROJECT MANAGEMENT AND COORDINATION****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
  - 1. General coordination procedures.
  - 2. Requests for Information (RFIs).
  - 3. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
  - 1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
  - 2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
  - 3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

**1.3 DEFINITIONS**

- A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

**1.4 INFORMATIONAL SUBMITTALS**

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
  - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
  - 2. Number and title of related Specification Section(s) covered by subcontract.

3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
1. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

## 1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
  3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
  3. Make adequate provisions to accommodate items scheduled for later installation.
- C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's construction schedule.
  2. Preparation of the schedule of values.
  3. Installation and removal of temporary facilities and controls.
  4. Delivery and processing of submittals.
  5. Progress meetings.
  6. Preinstallation conferences.
  7. Project closeout activities.
  8. Startup and adjustment of systems.
- E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

## 1.6 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
  2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
  2. Project number.
  3. Date.
  4. Name of Contractor.
  5. Name of Architect.
  6. RFI number, numbered sequentially.
  7. RFI subject.
  8. Specification Section number and title and related paragraphs, as appropriate.
  9. Drawing number and detail references, as appropriate.
  10. Field dimensions and conditions, as appropriate.
  11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  12. Contractor's signature.

13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
  - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect.
  1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow 7 working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
  1. The following Contractor-generated RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for approval of Contractor's means and methods.
    - d. Requests for coordination information already indicated in the Contract Documents.
    - e. Requests for adjustments in the Contract Time or the Contract Sum.
    - f. Requests for interpretation of Architect's actions on submittals.
    - g. Incomplete RFIs or inaccurately prepared RFIs.
  2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
  3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal.
    - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log monthly. Software log with not less than the following:
  1. Project name.
  2. Name and address of Contractor.
  3. Name and address of Architect.
  4. RFI number including RFIs that were returned without action or withdrawn.
  5. RFI description.
  6. Date the RFI was submitted.
  7. Date Architect's response was received.
- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within 7 days if Contractor disagrees with response.

1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

## 1.7 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
  1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
  2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, and Architect, within 3 days of the meeting.
  
- B. Preconstruction Conference: Architect will schedule and Architect and Contractor shall jointly conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
  1. Conduct the conference to review responsibilities and personnel assignments.
  2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  3. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing and long-lead items.
    - d. Designation of key personnel and their duties.
    - e. Lines of communications.
    - f. Procedures for processing field decisions and Change Orders.
    - g. Procedures for RFIs.
    - h. Procedures for testing and inspecting.
    - i. Procedures for processing Applications for Payment.
    - j. Distribution of the Contract Documents.
    - k. Submittal procedures.
    - l. Preparation of record documents.
    - m. Use of the premises and existing building.
    - n. Work restrictions.
    - o. Working hours.
    - p. Owner's occupancy requirements.

- q. Responsibility for temporary facilities and controls.
  - r. Procedures for moisture and mold control.
  - s. Procedures for disruptions and shutdowns.
  - t. Construction waste management and recycling.
  - u. Parking availability.
  - v. Office, work, and storage areas.
  - w. Equipment deliveries and priorities.
  - x. First aid.
  - y. Security.
  - z. Progress cleaning.
4. Minutes: Contractor will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction. Preinstallation conferences shall occur at the bimonthly progress meeting.
- D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than days prior to the scheduled date of Substantial Completion.
- 1. Conduct the conference to review requirements and responsibilities related to Project closeout.
  - 2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  - 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
    - a. Preparation of record documents.
    - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
    - c. Submittal of written warranties.
    - d. Requirements for preparing operations and maintenance data.
    - e. Requirements for delivery of material samples, attic stock, and spare parts.
    - f. Requirements for demonstration and training.
    - g. Preparation of Contractor's punch list.
    - h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
    - i. Submittal procedures.
    - j. Coordination of separate contracts.
    - k. Owner's partial occupancy requirements.
    - l. Installation of Owner's furniture, fixtures, and equipment.
    - m. Responsibility for removing temporary facilities and controls.
  - 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- E. Progress Meetings: Conduct progress meetings at twice a month intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
  - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    - 1) Review schedule for next period.
  - b. Review present and future needs of each entity present, including the following:
    - 1) Interface requirements.
    - 2) Sequence of operations.
    - 3) Status of submittals.
    - 4) Deliveries.
    - 5) Off-site fabrication.
    - 6) Access.
    - 7) Site utilization.
    - 8) Temporary facilities and controls.
    - 9) Progress cleaning.
    - 10) Quality and work standards.
    - 11) Status of correction of deficient items.
    - 12) Field observations.
    - 13) Status of RFIs.
    - 14) Status of proposal requests.
    - 15) Pending changes.
    - 16) Status of Change Orders.
    - 17) Pending claims and disputes.
    - 18) Documentation of information for payment requests.
4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
  - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

**END OF SECTION**

**013200****CONSTRUCTION PROGRESS DOCUMENTATION****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
  - 1. Startup construction schedule.
  - 2. Contractor's construction schedule.
  - 3. Construction schedule updating reports.
  - 4. Daily construction reports.
  - 5. Material location reports.
  - 6. Site condition reports.
  - 7. Special reports.
- B. Related Requirements:
  - 1. Section 013300 "Submittal Procedures" for submitting schedules and reports.
  - 2. Section 014000 "Quality Requirements" for submitting a schedule of tests and inspections.

**1.3 DEFINITIONS**

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
  - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
  - 2. Predecessor Activity: An activity that precedes another activity in the network.
  - 3. Successor Activity: An activity that follows another activity in the network.
- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

- C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Event: The starting or ending point of an activity.
- E. Float: The measure of leeway in starting and completing an activity.
  - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
  - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
  - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Startup construction schedule.
- B. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
  - 1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.
- D. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
  - 1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
  - 2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
  - 3. Total Float Report: List of all activities sorted in ascending order of total float.
- E. Construction Schedule Updating Reports: Submit with Applications for Payment.
- F. Daily Construction Reports: Submit at monthly intervals.
- G. Material Location Reports: Submit at monthly intervals.
- H. Site Condition Reports: Submit at time of discovery of differing conditions.
- I. Special Reports: Submit at time of unusual event.

## 1.5 COORDINATION

- A. Coordinate Contractor's construction schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.
  - 1. Secure time commitments for performing critical elements of the Work from entities involved.
  - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

## PART 2 - PRODUCTS

### 2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for commencement of the Work to date of Final Completion.
  - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
  - 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
  - 2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
  - 3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
  - 4. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
  - 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
  - 6. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
  - 1. Phasing: Arrange list of activities on schedule by phase.
  - 2. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.

3. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
  4. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
  5. Work Restrictions: Show the effect of the following items on the schedule:
    - a. Coordination with existing construction.
    - b. Limitations of continued occupancies.
    - c. Uninterruptible services.
    - d. Partial occupancy before Substantial Completion.
    - e. Use of premises restrictions.
    - f. Provisions for future construction.
    - g. Seasonal variations.
    - h. Environmental control.
  6. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
    - a. Subcontract awards.
    - b. Submittals.
    - c. Purchases.
    - d. Mockups.
    - e. Fabrication.
    - f. Sample testing.
    - g. Deliveries.
    - h. Installation.
    - i. Tests and inspections.
    - j. Adjusting.
    - k. Curing.
    - l. Building flush-out.
    - m. Startup and placement into final use and operation.
  7. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
    - a. Structural completion.
    - b. Temporary enclosure and space conditioning.
    - c. Permanent space enclosure.
    - d. Completion of mechanical installation.
    - e. Completion of electrical installation.
    - f. Substantial Completion.
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.

- E. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
  - 1. Unresolved issues.
  - 2. Unanswered Requests for Information.
  - 3. Rejected or unreturned submittals.
  - 4. Notations on returned submittals.
  - 5. Pending modifications affecting the Work and Contract Time.
- F. Recovery Schedule: When periodic update indicates the Work is 30 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.
- G. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

## **2.2 STARTUP CONSTRUCTION SCHEDULE**

- A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule within 7 days of date established for commencement of the Work.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

## **2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)**

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. CPM Schedule: Prepare Contractor's construction schedule using a time-scaled CPM network analysis diagram for the Work.
  - 1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 60 days after date established for the Notice of Award.
    - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
  - 2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.

3. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order to coordinate with the Contract Time.
- C. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.
1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
    - a. Preparation and processing of submittals.
    - b. Mobilization and demobilization.
    - c. Purchase of materials.
    - d. Delivery.
    - e. Fabrication.
    - f. Utility interruptions.
    - g. Installation.
    - h. Work by Owner that may affect or be affected by Contractor's activities.
    - i. Testing and commissioning.
    - j. Punch list and final completion.
    - k. Activities occurring following final completion.
  2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
  3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
  4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
    - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
- D. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall project schedule.
- E. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
  2. Description of activity.
  3. Main events of activity.
  4. Immediate preceding and succeeding activities.
  5. Early and late start dates.
  6. Early and late finish dates.

7. Activity duration in workdays.
  8. Total float or slack time.
  9. Average size of workforce.
  10. Dollar value of activity (coordinated with the schedule of values).
- F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
  2. Changes in early and late start dates.
  3. Changes in early and late finish dates.
  4. Changes in activity durations in workdays.
  5. Changes in the critical path.
  6. Changes in total float or slack time.
  7. Changes in the Contract Time.

## **2.4 REPORTS**

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
  2. List of separate contractors at Project site.
  3. Approximate count of personnel at Project site.
  4. Equipment at Project site.
  5. Material deliveries.
  6. High and low temperatures and general weather conditions, including presence of rain or snow.
  7. Accidents.
  8. Meetings and significant decisions.
  9. Unusual events (see special reports).
  10. Stoppages, delays, shortages, and losses.
  11. Meter readings and similar recordings.
  12. Emergency procedures.
  13. Orders and requests of authorities having jurisdiction.
  14. Change Orders received and implemented.
  15. Construction Change Directives received and implemented.
  16. Services connected and disconnected.
  17. Equipment or system tests and startups.
  18. Substantial Completions authorized.
- B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
1. Material stored prior to previous report and remaining in storage.

2. Material stored prior to previous report and since removed from storage and installed.
  3. Material stored following previous report and remaining in storage.
- C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

## **2.5 SPECIAL REPORTS**

- A. General: Submit special reports directly to Owner within 2 days of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

## **PART 3 - EXECUTION**

### **3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE**

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
  2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
  3. As the Work progresses, indicate final completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
  2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

**END OF SECTION**

**013300****SUBMITTAL PROCEDURES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
  - 1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
  - 2. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
  - 3. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
  - 4. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
  - 5. Section 017900 "Demonstration and Training" for demonstration of equipment and training of Owner's personnel.

**1.3 DEFINITIONS**

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

#### **1.4 ACTION SUBMITTALS**

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
  - 1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
  - 2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
  - 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
    - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
  - 4. Format: Arrange the following information in a tabular format:
    - a. Scheduled date for first submittal.
    - b. Specification Section number and title.
    - c. Submittal category: Action; informational.
    - d. Name of subcontractor.
    - e. Description of the Work covered.
    - f. Scheduled date for Architect's final release or approval.
    - g. Scheduled date of fabrication.
    - h. Scheduled dates for purchasing.
    - i. Scheduled dates for installation.
    - j. Activity or event number.

#### **1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS**

- A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
  3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
  4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 14 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
  2. Resubmittal Review: Allow 14 days for review of each resubmittal.
  3. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
- D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
  2. Provide a space approximately 4 by 5 inches (100 by 125 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
  3. Include the following information for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Name of subcontractor.
    - g. Name of supplier.
    - h. Name of manufacturer.
    - i. Submittal number or other unique identifier, including revision identifier.
      - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
    - j. Number and title of appropriate Specification Section.
    - k. Drawing number and detail references, as appropriate.

- I. Location(s) where product is to be installed, as appropriate.
      - m. Other necessary identification.
- 4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
- 5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will discard submittals received from sources other than Contractor.
  - a. Transmittal Form for Paper Submittals: Provide locations on form for the following information:
    - 1) Project name.
    - 2) Date.
    - 3) Destination (To:).
    - 4) Source (From:).
    - 5) Name and address of Architect.
    - 6) Name of Construction Manager.
    - 7) Name of Contractor.
    - 8) Name of firm or entity that prepared submittal.
    - 9) Names of subcontractor, manufacturer, and supplier.
    - 10) Category and type of submittal.
    - 11) Submittal purpose and description.
    - 12) Specification Section number and title.
    - 13) Specification paragraph number or drawing designation and generic name for each of multiple items.
    - 14) Drawing number and detail references, as appropriate.
    - 15) Indication of full or partial submittal.
    - 16) Transmittal number, numbered consecutively.
    - 17) Submittal and transmittal distribution record.
    - 18) Remarks.
    - 19) Signature of transmitter.
- E. Options: Identify options requiring selection by Architect.
- F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
  - 1. Note date and content of previous submittal.
  - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.

3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

## **PART 2 - PRODUCTS**

### **2.1 SUBMITTAL PROCEDURES**

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
  1. Action and Informational Submittals: Submit 7 paper copies of each submittal unless otherwise indicated. Architect will return a minimum of 3 copies.
  2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
    - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
    - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
  1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable.
  3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.
    - f. Application of testing agency labels and seals.
    - g. Notation of coordination requirements.
    - h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:
    - a. Wiring diagrams showing factory-installed wiring.
    - b. Printed performance curves.
    - c. Operational range diagrams.
    - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
  5. Submit Product Data before or concurrent with Samples.
  6. Submit Product Data in the following format:
    - a. PDF electronic file.
    - b. 6 paper copies of Product Data unless otherwise indicated. Architect will return a minimum of 3 copies.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.
    - b. Schedules.
    - c. Compliance with specified standards.
    - d. Notation of coordination requirements.
    - e. Notation of dimensions established by field measurement.
    - f. Relationship and attachment to adjoining construction clearly indicated.
    - g. Seal and signature of professional engineer if specified.
  2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm).
  3. Submit Shop Drawings in the following format:
    - a. PDF electronic file.
    - b. 6 opaque (bond) copies of each submittal. Architect will return a minimum of 3 copies.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  2. Identification: Attach label on unexposed side of Samples that includes the following:
    - a. Generic description of Sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.

- d. Number and title of applicable Specification Section.
  - e. Specification paragraph number and generic name of each item.
3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
  4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
    - a. Number of Samples: Submit 2 full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will retain submittal with options selected.
  5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
    - a. Number of Samples: Submit 2 sets of Samples. Architect will retain Sample sets.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
  2. Manufacturer and product name, and model number if applicable.
  3. Number and name of room or space.
  4. Location within room or space.
  5. Submit product schedule in the following format:
    - a. PDF electronic file.
    - b. 2 paper copies of product schedule or list unless otherwise indicated. Architect.
- F. Coordination Drawing Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."
- G. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."
- H. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."

- I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014000 "Quality Requirements."
- J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."
- K. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."
- L. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- N. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- O. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- R. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- S. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- T. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
  - 1. Name of evaluation organization.
  - 2. Date of evaluation.
  - 3. Time period when report is in effect.
  - 4. Product and manufacturers' names.
  - 5. Description of product.

6. Test procedures and results.
  7. Limitations of use.
- U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- V. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- W. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- X. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

## **2.2 DELEGATED-DESIGN SERVICES**

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

## **PART 3 - EXECUTION**

### **3.1 CONTRACTOR'S REVIEW**

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal

has been reviewed, checked, and approved for compliance with the Contract Documents.

### **3.2 ARCHITECT'S ACTION**

- A. Action and Informational Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- C. Submittals not required by the Contract Documents may be returned by the Architect without action.
- D. The Architect and its Consultants will check submittals twice at no expense to the Contractor. Additional subsequent reviews will be charged to the Contractor (Contract Sum will be adjusted by Change Order). A submittal without a Contractor's review stamp or incomplete submittals will be considered one of the submittal reviews.

**END OF SECTION**

**014000****QUALITY REQUIREMENTS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

**1.3 DEFINITIONS**

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

- D. **Product Testing:** Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- E. **Source Quality-Control Testing:** Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- F. **Field Quality-Control Testing:** Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- G. **Testing Agency:** An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- H. **Installer/Applicator/Erector:** Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
  - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- I. **Experienced:** When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

#### **1.4 CONFLICTING REQUIREMENTS**

- A. **Referenced Standards:** If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. **Minimum Quantity or Quality Levels:** The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

#### **1.5 REPORTS AND DOCUMENTS**

- A. **Test and Inspection Reports:** Prepare and submit certified written reports specified in other Sections. Include the following:
  - 1. Date of issue.
  - 2. Project title and number.

3. Name, address, and telephone number of testing agency.
  4. Dates and locations of samples and tests or inspections.
  5. Names of individuals making tests and inspections.
  6. Description of the Work and test and inspection method.
  7. Identification of product and Specification Section.
  8. Complete test or inspection data.
  9. Test and inspection results and an interpretation of test results.
  10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  12. Name and signature of laboratory inspector.
  13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of technical representative making report.
  2. Statement on condition of substrates and their acceptability for installation of product.
  3. Statement that products at Project site comply with requirements.
  4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  6. Statement whether conditions, products, and installation will affect warranty.
  7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of factory-authorized service representative making report.
  2. Statement that equipment complies with requirements.
  3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  4. Statement whether conditions, products, and installation will affect warranty.
  5. Other required items indicated in individual Specification Sections.
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

**1.6 QUALITY ASSURANCE**

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
  - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
  - 1. Contractor responsibilities include the following:
    - a. Provide test specimens representative of proposed products and construction.

- b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
- c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
- d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
- e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.

## 1.7 QUALITY CONTROL

- A. Design Team Responsibilities: Where quality-control services are indicated as the Design Team's responsibility, the Design Team will engage a Testing Agency (Froehling & Robertson) to perform these services.
  1. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to the Design Team are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
  1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
  2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
    - a. Contractor shall not employ same entity engaged by the Design Team, unless agreed to in writing by Owner.
  3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
  4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."
- D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences,

examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

- E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- F. Testing Agency Responsibilities: Cooperate with Design Team and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
  - 1. Notify Design Team, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  - 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  - 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  - 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  - 6. Do not perform any duties of Contractor.
- G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
  - 1. Access to the Work.
  - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
  - 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  - 4. Facilities for storage and field curing of test samples.
  - 5. Delivery of samples to testing agencies.
  - 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  - 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
  - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.

1. Distribution: Distribute schedule to Owner, Design Team, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

## **1.8 SPECIAL TESTS AND INSPECTIONS**

- A. Special Tests and Inspections: Design Team will engage a qualified testing agency/special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in this Section.

## **PART 2 - PRODUCTS (Not Used)**

## **PART 3 - EXECUTION**

### **3.1 TEST AND INSPECTION LOG**

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
  1. Date test or inspection was conducted.
  2. Description of the Work tested or inspected.
  3. Date test or inspection results were transmitted to Architect.
  4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's, and Commissioning Authority's, reference during normal working hours.

### **3.2 REPAIR AND PROTECTION**

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
  1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

**3.3 TYPE OF INSPECTIONS**

- A. Inspections shall include, but will not be limited to the following:
- B. Sitework:
  - 1. Compaction of fill materials.
  - 2. Bearing capacity.
  - 3. Fill placement.
- C. Foundations:
  - 1. Compaction of fill materials.
  - 2. Bearing at the bottom of footing excavations.
  - 3. Size of footing.
  - 4. Size and placement of reinforcing steel in foundations.
- D. Concrete:
  - 1. Test cylinders.
  - 2. Mix proportions and mix on delivery trucks.
  - 3. Slump tests.
  - 4. Placement procedures.
- E. Masonry:
  - 1. Condition, size, location of reinforcing steel in masonry assemblies.
  - 2. Placement of masonry units, mortar and accessories.
  - 3. Placement and location of anchors.
  - 4. Grouting of masonry.

**END OF SECTION**

**015000****TEMPORARY FACILITIES AND CONTROLS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
  - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

**1.3 USE CHARGES**

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.
- B. Water from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

**1.4 INFORMATIONAL SUBMITTALS**

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

- C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- D. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
  - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
  - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
  - 3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
- E. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
  - 1. Locations of dust-control partitions at each phase of work.
  - 2. HVAC system isolation schematic drawing.
  - 3. Location of proposed air-filtration system discharge.
  - 4. Waste handling procedures.
  - 5. Other dust-control measures.
- F. Security Plan: Describe procedures and controls for providing security of the building during non-working hours.

## **1.5 QUALITY ASSURANCE**

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

## **1.6 PROJECT CONDITIONS**

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top rails.
- B. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide concrete bases for supporting posts.
- C. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.
- D. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches (914 by 1624 mm).
- E. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

### **2.2 TEMPORARY FACILITIES**

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
  - 1. Store combustible materials apart from building.

### **2.3 EQUIPMENT**

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

**PART 3 - EXECUTION****3.1 INSTALLATION, GENERAL**

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
  - 1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

**3.2 TEMPORARY UTILITY INSTALLATION**

- A. General: Install temporary service or connect to existing service.
  - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
  - 1. Toilets: Use of Owner's existing toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- D. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- E. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
  - 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
    - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.

- b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
  2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
  3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
  1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
- G. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
  1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
  2. Install lighting for Project identification sign.
- I. Telephone Service: Provide telephone service in common-use facilities for use by all construction personnel.
  1. Post a list of important telephone numbers.
    - a. Police and fire departments.
    - b. Ambulance service.
    - c. Contractor's home office.
    - d. Contractor's emergency after-hours telephone number.
    - e. Architect's office.
    - f. Engineers' offices.
    - g. Owner's office.
    - h. Principal subcontractors' field and home offices.
  2. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

### **3.3 SUPPORT FACILITIES INSTALLATION**

- A. Traffic Controls: Comply with requirements of authorities having jurisdiction.
  - 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
  - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- B. Parking: Use designated areas of Owner's existing parking areas for construction personnel.
- C. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
  - 1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
  - 2. Remove snow and ice as required to minimize accumulations.
- D. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
  - 1. Identification Signs: Provide Project identification signs as included at the end of this section.
  - 2. Maintain and touchup signs so they are legible at all times.
- E. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- F. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
  - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- G. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
  - 1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.

### **3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION**

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 011000 "Summary."
- C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings or requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
  2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
  3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
  4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- E. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- F. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.
- G. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
  2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
- H. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- I. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- J. Covered Walkway: Erect protective, covered walkway for passage of individuals through or adjacent to Project site as required. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction and requirements indicated on Drawings.

1. Construct covered walkways using scaffold or shoring framing.
  2. Provide overhead decking, protective enclosure walls, handrails, barricades, warning signs, exit signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage.
- K. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- L. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.
1. Construct dustproof partitions with two layers of 6-mil (0.14-mm) polyethylene sheet on each side. Cover floor with two layers of 6-mil (0.14-mm) polyethylene sheet, extending sheets 18 inches (460 mm) up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant-treated plywood.
    - a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches (1219 mm) between doors. Maintain water-dampened foot mats in vestibule.
  2. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
  3. Insulate partitions to control noise transmission to occupied areas.
  4. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
  5. Protect air-handling equipment.
  6. Provide walk-off mats at each entrance through temporary partition.
- M. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
1. Prohibit smoking in the existing building.
  2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
  3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
  4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

- N. After Hours Security: Provide qualified personnel to insure that the building is secure during non-working hours, including evenings and weekends during times when the exterior walls of the building are open and the interior of the building is accessible.

### **3.5 MOISTURE AND MOLD CONTROL**

- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
  - 1. Protect porous materials from water damage.
  - 2. Protect stored and installed material from flowing or standing water.
  - 3. Keep porous and organic materials from coming into prolonged contact with concrete.
  - 4. Remove standing water from decks.
  - 5. Keep deck openings covered or dammed.

### **3.6 OPERATION, TERMINATION, AND REMOVAL**

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
  - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
  - 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
  - 2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

**END OF SECTION**

**017300****EXECUTION****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
  - 1. Construction layout.
  - 2. Installation of the Work.
  - 3. Cutting and patching.
  - 4. Coordination of Owner-installed products.
  - 5. Progress cleaning.
  - 6. Starting and adjusting.
  - 7. Protection of installed construction.
- B. Related Requirements:
  - 1. Section 011000 "Summary" for limits on use of Project site.
  - 2. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
  - 3. Section 024120 "Selective Building Demolition" for demolition and removal of selected portions of the building.

**1.3 DEFINITIONS**

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

**1.4 QUALITY ASSURANCE**

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. **Structural Elements:** When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
2. **Operational Elements:** Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety.
3. **Other Construction Elements:** Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
4. **Visual Elements:** Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. **In-Place Materials:** Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. **Existing Conditions:** The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
  1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.

- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
  - 1. Description of the Work.
  - 2. List of detrimental conditions, including substrates.
  - 3. List of unacceptable installation tolerances.
  - 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### **3.2 PREPARATION**

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

### 3.3 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
  - 4. Maintain minimum headroom clearance of 96 inches (2440 mm) in occupied spaces and 90 inches (2300 mm) in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
  - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
  - 2. Allow for building movement, including thermal expansion and contraction.
  - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### **3.4 CUTTING AND PATCHING**

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Temporary Support: Provide temporary support of work to be cut.
- C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- D. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."
- E. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- F. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
  - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  - 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
  - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  - 6. Proceed with patching after construction operations requiring cutting are complete.

- G. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
    - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    - b. Restore damaged pipe covering to its original condition.
  3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
    - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
  4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- H. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

### 3.5 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
  3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
    - a. Use containers intended for holding waste materials of type to be stored.

4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  1. Remove liquid spills promptly.
  2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- F. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."
- G. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- H. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- I. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### **3.6 STARTING AND ADJUSTING**

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

**3.7 PROTECTION OF INSTALLED CONSTRUCTION**

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

**END OF SECTION**

**017419****CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for the following:
  - 1. Salvaging nonhazardous demolition and construction waste.
  - 2. Recycling nonhazardous demolition and construction waste.
  - 3. Disposing of nonhazardous demolition and construction waste.
- B. Related Requirements:
  - 1. Section 024120 "Selective Building Demolition" for disposition of waste resulting from partial demolition of site improvements.
  - 2. Section 042000 "Unit Masonry" for disposal requirements for masonry waste.

**1.3 DEFINITIONS**

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

## 1.4 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of 75 percent by weight of total non-hazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials, including the following:

1. Demolition Waste:

- a. Concrete reinforcing steel.
- b. Brick.
- c. Wood trim.
- d. Structural and miscellaneous steel.
- e. Rough hardware.
- f. Insulation.
- g. Doors and frames.
- h. Door hardware.
- i. Windows.
- j. Glazing.
- k. Metal studs.
- l. Gypsum board.
- m. Acoustical tile and panels.
- n. Floor finishes.
- o. Equipment.
- p. Piping.
- q. Supports and hangers.
- r. Valves.
- s. Mechanical equipment.
- t. Electrical conduit.
- u. Copper wiring.

2. Construction Waste:

- a. Masonry and CMU.
- b. Lumber.
- c. Wood sheet materials.
- d. Wood trim.
- e. Metals.
- f. Piping.
- g. Electrical conduit.
- h. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
  - 1) Paper.
  - 2) Cardboard.
  - 3) Boxes.
  - 4) Plastic sheet and film.
  - 5) Polystyrene packaging.
  - 6) Wood crates.

**1.5 ACTION SUBMITTALS**

- A. Waste Management Plan: Submit plan within 30 days of date established for the Notice of Award.

**1.6 INFORMATIONAL SUBMITTALS**

- A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Include the following information:
  - 1. Material category.
  - 2. Generation point of waste.
  - 3. Total quantity of waste in tons (tonnes).
  - 4. Quantity of waste salvaged, both estimated and actual in tons (tonnes).
  - 5. Quantity of waste recycled, both estimated and actual in tons (tonnes).
  - 6. Total quantity of waste recovered (salvaged plus recycled) in tons (tonnes).
  - 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- D. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- E. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

**1.7 QUALITY ASSURANCE**

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

**1.8 WASTE MANAGEMENT PLAN**

- A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

**PART 2 - PRODUCTS (Not Used)****PART 3 - EXECUTION****3.1 PLAN IMPLEMENTATION**

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
  - 1. Comply with operation, termination, and removal requirements in Section 015000 "Temporary Facilities and Controls."
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
  - 1. Distribute waste management plan to everyone concerned within 3 days of submittal return.
  - 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
  - 2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

**3.2 SALVAGING DEMOLITION WASTE**

- A. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:
  - 1. Clean salvaged items.
  - 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
  - 3. Store items in a secure area until installation.
  - 4. Protect items from damage during transport and storage.
  - 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- B. Salvaged Items for Sale and Donation Not permitted on Project site.
- C. Salvaged Items for Owner's Use: Salvage items for Owner's use and handle as follows:

1. Clean salvaged items.
  2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
  3. Store items in a secure area until delivery to Owner.
  4. Transport items to Owner's storage area designated by Owner.
  5. Protect items from damage during transport and storage.
- D. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.
- E. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.

### **3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL**

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
    - a. Inspect containers and bins for contamination and remove contaminated materials if found.
  2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
  4. Store components off the ground and protect from the weather.
  5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

### **3.4 RECYCLING DEMOLITION WASTE**

- A. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
1. Pulverize masonry to maximum 4-inch (100-mm) size.
  2. Clean and stack undamaged, whole masonry units on wood pallets.

- B. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- C. Metals: Separate metals by type.
  - 1. Structural Steel: Stack members according to size, type of member, and length.
  - 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- D. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- E. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
- F. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.
- G. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- H. Conduit: Reduce conduit to straight lengths and store by type and size.

### **3.5 RECYCLING CONSTRUCTION WASTE**

- A. Packaging:
  - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
  - 2. Polystyrene Packaging: Separate and bag materials.
  - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
  - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Wood Materials:
  - 1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.

### **3.6 DISPOSAL OF WASTE**

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
  - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
  - C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

**END OF SECTION**

**017700****CLOSEOUT PROCEDURES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Substantial Completion procedures.
  - 2. Final completion procedures.
  - 3. Warranties.
  - 4. Final cleaning.
  - 5. Repair of the Work.
- B. Related Requirements:
  - 1. Section 017300 "Execution" for progress cleaning of Project site.
  - 2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
  - 3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
  - 4. Section 017900 "Demonstration and Training" for requirements for instructing Owner's personnel.

**1.3 ACTION SUBMITTALS**

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

**1.4 CLOSEOUT SUBMITTALS**

- A. Certificates of Release: From authorities having jurisdiction.

**1.5 MAINTENANCE MATERIAL SUBMITTALS**

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

**1.6 SUBSTANTIAL COMPLETION PROCEDURES**

- A. Definition: Substantial Completion is the date that the Work is 100% complete and includes all closeout information and submittals included in the Contract Documents.
- B. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- C. Submittals Prior to Substantial Completion: Complete the following a minimum of 7 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, and similar final record information.
  3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Owner. Label with manufacturer's name and model number where applicable.
    - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Owner's signature for receipt of submittals.
  5. Submit test/adjust/balance records.
  6. Submit sustainable design submittals required in Section 018113.13 "Sustainable Design Requirements" and in individual Sections.
  7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
  8. Submit Application for Payment for 100% completion of the Work, with the exception of the retainage.
- D. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  2. Complete startup and testing of systems and equipment.
  3. Perform preventive maintenance on equipment used prior to Substantial Completion.
  4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
  5. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  6. Complete final cleaning requirements, including touchup painting.
  7. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- E. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected. The Architect and its Consultants will only provide one Substantial Completion inspection. Additional inspections will be charged to the Contractor (Contract Sum will be adjusted by Change Order).
  2. Results of completed inspection will form the basis of requirements for final completion.

## **1.7 FINAL COMPLETION PROCEDURES**

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
  2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected. The Architect and its Consultants will only provide one Final Completion inspection. Additional inspections will be charged to the Contractor (Contract Sum will be adjusted by Change Order).

## **1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)**

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
  1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
  2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
  3. Include the following information at the top of each page:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Contractor.
    - e. Page number.
  4. Submit list of incomplete items in the following format:
    - a. MS Word or PDF electronic file.

## **1.9 SUBMITTAL OF PROJECT WARRANTIES**

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
  1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
  2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
  - 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

## **PART 3 - EXECUTION**

### **3.1 FINAL CLEANING**

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    - e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    - f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

- g. Sweep concrete floors broom clean in unoccupied spaces.
  - h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
  - i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
  - j. Remove labels that are not permanent.
  - k. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
  - l. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
  - m. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
  - n. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
    - 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
  - o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
  - p. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."

### **3.2 REPAIR OF THE WORK**

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
  - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
  - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.

- a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

**END OF SECTION**

**017823****OPERATION AND MAINTENANCE DATA****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Operation and maintenance documentation directory.
  - 2. Operation manuals for systems, subsystems, and equipment.
  - 3. Product maintenance manuals.
  - 4. Systems and equipment maintenance manuals.
- B. Related Requirements:
  - 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

**1.3 DEFINITIONS**

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

**1.4 CLOSEOUT SUBMITTALS**

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
  - 1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
  - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:

1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.
    - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
    - b. Enable inserted reviewer comments on draft submittals.
  2. Two paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves.
- C. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 30 days before commencing demonstration and training. Architect and Commissioning Authority will return copy with comments.
1. Correct or revise each manual to comply with Architect's and Commissioning Authority's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's and Commissioning Authority's comments and prior to commencing demonstration and training.

## **PART 2 - PRODUCTS**

### **2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY**

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
1. List of documents.
  2. List of systems.
  3. List of equipment.
  4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

## 2.2 REQUIREMENTS FOR OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
1. Title page.
  2. Table of contents.
  3. Manual contents.
- B. Title Page: Include the following information:
1. Subject matter included in manual.
  2. Name and address of Project.
  3. Name and address of Owner.
  4. Date of submittal.
  5. Name and contact information for Contractor.
  6. Name and contact information for Construction Manager.
  7. Name and contact information for Architect.
  8. Name and contact information for Commissioning Authority.
  9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
  10. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
  2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

- F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
    - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
    - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
  2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
  3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
  4. Supplementary Text: Prepared on 8-1/2-by-11-inch (215-by-280-mm) white bond paper.
  5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
    - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

### 2.3 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
  2. Performance and design criteria if Contractor has delegated design responsibility.
  3. Operating standards.
  4. Operating procedures.
  5. Operating logs.
  6. Wiring diagrams.
  7. Control diagrams.

8. Piped system diagrams.
  9. Precautions against improper use.
  10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
1. Product name and model number. Use designations for products indicated on Contract Documents.
  2. Manufacturer's name.
  3. Equipment identification with serial number of each component.
  4. Equipment function.
  5. Operating characteristics.
  6. Limiting conditions.
  7. Performance curves.
  8. Engineering data and tests.
  9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
  2. Equipment or system break-in procedures.
  3. Routine and normal operating instructions.
  4. Regulation and control procedures.
  5. Instructions on stopping.
  6. Normal shutdown instructions.
  7. Seasonal and weekend operating instructions.
  8. Required sequences for electric or electronic systems.
  9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

## **2.4 PRODUCT MAINTENANCE MANUALS**

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
1. Product name and model number.

2. Manufacturer's name.
  3. Color, pattern, and texture.
  4. Material and chemical composition.
  5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
  2. Types of cleaning agents to be used and methods of cleaning.
  3. List of cleaning agents and methods of cleaning detrimental to product.
  4. Schedule for routine cleaning and maintenance.
  5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

## **2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS**

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
1. Standard maintenance instructions and bulletins.
  2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
  3. Identification and nomenclature of parts and components.
  4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.

2. Troubleshooting guide.
  3. Precautions against improper maintenance.
  4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  5. Aligning, adjusting, and checking instructions.
  6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
  2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

## **PART 3 - EXECUTION**

### **3.1 MANUAL PREPARATION**

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
  2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

- D. **Manufacturers' Data:** Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- E. **Drawings:** Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
1. Do not use original project record documents as part of operation and maintenance manuals.
  2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."
- F. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

**END OF SECTION**

**017839****PROJECT RECORD DOCUMENTS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for project record documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
- B. Related Requirements:
  - 1. Section 017700 "Closeout Procedures" for general closeout procedures.
  - 2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

**1.3 CLOSEOUT SUBMITTALS**

- A. Record Drawings: Comply with the following:
  - 1. Submit one set(s) of marked-up record prints.
- B. Record Specifications: Submit one paper copy of Project's Specifications, including addenda and contract modifications.

**PART 2 - PRODUCTS****2.1 RECORD DRAWINGS**

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
  - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
  - b. Accurately record information in an acceptable drawing technique.
  - c. Record data as soon as possible after obtaining it.
  - d. Record and check the markup before enclosing concealed installations.
  - e. Cross-reference record prints to corresponding archive photographic documentation.
2. Content: Types of items requiring marking include, but are not limited to, the following:
  - a. Dimensional changes to Drawings.
  - b. Revisions to details shown on Drawings.
  - c. Depths of foundations below first floor.
  - d. Locations and depths of underground utilities.
  - e. Revisions to routing of piping and conduits.
  - f. Revisions to electrical circuitry.
  - g. Actual equipment locations.
  - h. Duct size and routing.
  - i. Locations of concealed internal utilities.
  - j. Changes made by Addendum.
  - k. Changes made by Change Order or Construction Change Directive.
  - l. Changes made following Architect's written orders.
  - m. Details not on the original Contract Drawings.
  - n. Field records for variable and concealed conditions.
  - o. Record information on the Work that is shown only schematically.
3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

## 2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
  3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
  4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
  5. Note related Addendum(s), Change Orders, and record Drawings where applicable.
- B. Format: Submit record Specifications as paper copy.

### **PART 3 - EXECUTION**

#### **3.1 RECORDING AND MAINTENANCE**

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

**END OF SECTION**

**017900****DEMONSTRATION AND TRAINING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
  - 1. Demonstration of operation of systems, subsystems, and equipment.
  - 2. Training in operation and maintenance of systems, subsystems, and equipment.
- B. Related Sections: Refer to Divisions 2 through 26 for specific training and demonstration requirements.

**1.3 INFORMATIONAL SUBMITTALS**

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
  - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.
- B. Attendance Record: For each training module, submit list of participants and length of instruction time.

**1.4 QUALITY ASSURANCE**

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.

## 1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

## PART 2 - PRODUCTS

### 2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
  - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
    - a. System, subsystem, and equipment descriptions.
    - b. Operating standards.
    - c. Regulatory requirements.
    - d. Equipment function.
    - e. Operating characteristics.
    - f. Limiting conditions.
    - g. Performance curves.
  - 2. Documentation: Review the following items in detail:
    - a. Operations manuals.
    - b. Maintenance manuals.
    - c. Project record documents.
    - d. Identification systems.
    - e. Warranties and bonds.
    - f. Maintenance service agreements and similar continuing commitments.
  - 3. Operations: Include the following, as applicable:
    - a. Startup procedures.

- b. Equipment or system break-in procedures.
  - c. Routine and normal operating instructions.
  - d. Regulation and control procedures.
  - e. Control sequences.
  - f. Safety procedures.
  - g. Instructions on stopping.
  - h. Normal shutdown instructions.
  - i. Operating procedures for emergencies.
  - j. Operating procedures for system, subsystem, or equipment failure.
  - k. Seasonal and weekend operating instructions.
  - l. Required sequences for electric or electronic systems.
  - m. Special operating instructions and procedures.
4. Adjustments: Include the following:
- a. Alignments.
  - b. Checking adjustments.
  - c. Noise and vibration adjustments.
  - d. Economy and efficiency adjustments.
5. Troubleshooting: Include the following:
- a. Diagnostic instructions.
  - b. Test and inspection procedures.
6. Maintenance: Include the following:
- a. Inspection procedures.
  - b. Types of cleaning agents to be used and methods of cleaning.
  - c. List of cleaning agents and methods of cleaning detrimental to product.
  - d. Procedures for routine cleaning
  - e. Procedures for preventive maintenance.
  - f. Procedures for routine maintenance.
  - g. Instruction on use of special tools.
7. Repairs: Include the following:
- a. Diagnosis instructions.
  - b. Repair instructions.
  - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  - d. Instructions for identifying parts and components.
  - e. Review of spare parts needed for operation and maintenance.

**PART 3 - EXECUTION****3.1 PREPARATION**

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

**3.2 INSTRUCTION**

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
  - 1. Owner will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
  - 1. Schedule training with Owner with at least 7 days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- E. Cleanup: Collect used and leftover educational materials and remove from Project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

**END OF SECTION**

**024119****SELECTIVE DEMOLITION****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Demolition and removal of selected portions of building or structure.
  - 2. Demolition and removal of selected site elements.
  - 3. Salvage of existing items to be reused or recycled.
- B. Related Requirements:
  - 1. Section 011000 "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
  - 2. Section 017300 "Execution" for cutting and patching procedures.

**1.3 DEFINITIONS**

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- C. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

**1.4 MATERIALS OWNERSHIP**

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

**1.5 INFORMATIONAL SUBMITTALS**

- A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental

protection and, for dust control. Indicate proposed locations and construction of barriers.

B. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's -site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Use of stairs.
5. Coordination of Owner's continuing occupancy of portions of existing building.

## 1.6 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
  1. Maintain fire-protection facilities in service during selective demolition operations.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

### **3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS**

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

### **3.3 PREPARATION**

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 1. Comply with requirements for access and protection specified in Section 015000 "Temporary Facilities and Controls."
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
  - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  - 4. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

### **3.4 SELECTIVE DEMOLITION, GENERAL**

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain and temporarily supplement portable fire-suppression devices during flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 "Construction Waste Management and Disposal."

- B. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Protect items from damage during storage.
3. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

### **3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS**

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch (19 mm) at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

- B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.
- C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
- D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.
- E. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight.

### **3.6 DISPOSAL OF DEMOLISHED MATERIALS**

- A. General: Remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
  - 1. Do not allow demolished materials to accumulate on-site.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  - 3. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.

### **3.7 CLEANING**

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

**END OF SECTION**

**033000****CAST-IN-PLACE CONCRETE****PART 1 - GENERAL****1.1 SECTION REQUIREMENTS**

- A. Submittals: Product Data, concrete mix designs, and submittals required by ACI 301.
- B. Ready-Mixed Concrete Producer Qualifications: ASTM C 94/C 94M.
- C. Comply with ACI 301, "Specification for Structural Concrete"; ACI 117, "Specifications for Tolerances for Concrete Construction and Materials"; and CRSI's "Manual of Standard Practice."

**PART 2 - PRODUCTS****2.1 MATERIALS**

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Deformed-Steel Welded Wire Reinforcement: ASTM A 497, flat sheet.
- C. Portland Cement: ASTM C 150, Type I or II.
- D. Fly Ash: ASTM C 618, Type C or F.
- E. Aggregates: ASTM C 33, uniformly graded.
- F. Synthetic Fiber: ASTM C 1116, Type III, polypropylene fibers, 1/2 to 1-1/2 inches long.
- G. Air-Entraining Admixture: ASTM C 260.
- H. Chemical Admixtures: ASTM C 494, water reducing. Do not use calcium chloride or admixtures containing calcium chloride.
- I. Vapor Retarder: Clear 10-mil- thick polyethylene sheet.
- J. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.
- K. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

## 2.2 MIXES

- A. Comply with ACI 301 requirements for concrete mixtures.
- B. Normal-Weight Concrete: Prepare design mixes, proportioned according to ACI 301, as follows:
  - 1. Minimum Compressive Strength: 3000 psi at 28 days.
  - 2. Maximum Water-Cementitious Materials Ratio: 0.50.
  - 3. Slump Limit: 4 inches, plus or minus 1 inch.
  - 4. Air Content: Maintain within range permitted by ACI 301. Do not allow air content of floor slabs to receive troweled finishes to exceed 3 percent.
- C. Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116.
  - 1. When air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

## PART 3 - EXECUTION

### 3.1 CONCRETING

- A. Construct formwork according to ACI 301 and maintain tolerances and surface irregularities within ACI 347R limits of Class A, 1/8 inch for concrete exposed to view and Class C, 1/2 inch for other concrete surfaces.
- B. Place vapor retarder on prepared subgrade, with joints lapped 6 inches and sealed.
- C. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- D. Install construction, isolation, and contraction joints where indicated. Install full-depth joint-filler strips at isolation joints.
- E. Place concrete in a continuous operation and consolidate using mechanical vibrating equipment.
- F. Protect concrete from physical damage, premature drying, and reduced strength due to hot or cold weather during mixing, placing, and curing.
- G. Formed Surface Finish: Smooth-formed finish for concrete exposed to view, coated, or covered by waterproofing or other direct-applied material; rough-formed finish elsewhere.
- H. Slab Finishes: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces. Provide the following finishes:
  - 1. Scratch finish for surfaces to receive mortar setting beds.

2. Float finish for interior steps and ramps and surfaces to receive waterproofing, roofing, or other direct-applied material.
  3. Troweled finish for floor surfaces and floors to receive floor coverings, paint, or other thin film-finish coatings.
  4. Trowel and fine-broom finish for surfaces to receive thin-set tile.
  5. Nonslip-broom finish to exterior concrete platforms, steps, and ramps.
- I. Cure formed surfaces by moist curing for at least seven days.
  - J. Begin curing concrete slabs after finishing. Apply membrane-forming curing compound to concrete.
  - K. Owner will engage a testing agency to perform field tests and to submit test reports.
  - L. Protect concrete from damage. Repair surface defects in formed concrete and slabs.

**END OF SECTION**

**042000****UNIT MASONRY****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section Includes:

1. Concrete masonry units.
2. Face brick.
3. Mortar and grout.
4. Steel reinforcing bars.
5. Masonry joint reinforcement.
6. Ties and anchors.
7. Embedded flashing.
8. Miscellaneous masonry accessories.
9. Masonry-cell insulation.

- B. Related Sections:

1. Section 055000 "Metal Fabrications" for furnishing steel lintels for unit masonry and hoist beams.

**1.3 DEFINITIONS**

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

**1.4 PERFORMANCE REQUIREMENTS**

- A. Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days.
1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

**1.5 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For the following:
  - 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
  - 2. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."
  - 3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.
- C. Samples for Initial Selection:
  - 1. Face brick, in the form of straps of five or more bricks.

**1.6 INFORMATIONAL SUBMITTALS**

- A. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.
  - 1. Submittal is for information only. Neither receipt of list nor approval of mockup constitutes approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and approved in writing.
- B. Material Certificates: For each type and size of the following:
  - 1. Masonry units.
    - a. Include material test reports substantiating compliance with requirements.
    - b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
    - c. For exposed brick, include test report for efflorescence according to ASTM C 67.
  - 2. Cementitious materials. Include brand, type, and name of manufacturer.
  - 3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
  - 4. Grout mixes. Include description of type and proportions of ingredients.
  - 5. Reinforcing bars.
  - 6. Joint reinforcement.
  - 7. Anchors, ties, and metal accessories.
- C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91 for air content.
- D. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

## 1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.
- B. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.
- D. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.
- E. Sample Panels: Build sample panels to verify selections made under sample submittals and to demonstrate aesthetic effects.
  1. Build sample panels for each type of exposed unit masonry construction in sizes approximately 48 inches (1200 mm) long by 48 inches (1200 mm) high by full thickness.
  2. Where masonry is to match existing, erect panels adjacent and parallel to existing surface.
  3. Clean exposed faces of panels with masonry cleaner indicated.
  4. Protect approved sample panels from the elements with weather-resistant membrane.
  5. Approval of sample panels is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.
    - a. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless such deviations are specifically approved by Architect in writing.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

## 1.9 PROJECT CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
  - 1. Extend cover a minimum of 24 inches (600 mm) down both sides of walls and hold cover securely in place.
  - 2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe and hold cover in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
  - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
  - 2. Protect sills, ledges, and projections from mortar droppings.
  - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
  - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
  - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

## **PART 2 - PRODUCTS**

### **2.1 MASONRY UNITS, GENERAL**

- A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.
- B. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

### **2.2 CONCRETE MASONRY UNITS**

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
  2. Provide units for outside corners unless otherwise indicated.
- B. CMUs: ASTM C 90.
1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi (14.8 MPa).
  2. Density Classification: Lightweight.
  3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.

### **2.3 BRICK**

- A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
  2. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
  3. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
  4. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

- B. Face Brick: Facing brick complying with ASTM C 216.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. General Shale Brick.
    - b. Lawrenceville Brick.
    - c. Lee Brick.
    - d. Old Virginia Brick.
    - e. Pine Hall Brick.
    - f. Triangle Brick.
  2. Grade: SW.
  3. Type: FBS.
  4. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 4150 psi (28.61 MPa).
  5. Initial Rate of Absorption: Less than 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested per ASTM C 67.
  6. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
  7. Surface Coating: Brick with colors or textures produced by application of coatings shall withstand 50 cycles of freezing and thawing per ASTM C 67 with no observable difference in the applied finish when viewed from 10 feet (3 m).
  8. Size (Actual Dimensions): 3-5/8 inches (92 mm) wide by 2-3/4 inches (70 mm) high by 7-5/8 inches (194 mm) long or 5 brick courses equals 1'-4".
  9. Application: Use where brick is exposed unless otherwise indicated.
  10. Where shown to "match existing," provide face brick matching color range, texture, and size of existing adjacent brickwork.

## 2.4 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Masonry Cement: ASTM C 91.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Capital Materials Corporation; Flamingo Color Masonry Cement.
    - b. Lafarge North America Inc.; Lafarge Masonry Cement.
    - c. Lehigh Cement Company; Lehigh Masonry Cement.
- D. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979. Use only pigments with a record of satisfactory performance in masonry mortar.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Davis Colors; True Tone Mortar Colors.
  - b. Lanxess Corporation; Bayferrox Iron Oxide Pigments.
  - c. Solomon Colors, Inc.; SGS Mortar Colors.
- E. Aggregate for Mortar: ASTM C 144.
  1. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- F. Water: Potable.

## 2.5 REINFORCEMENT

- A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60 (Grade 420).
- B. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.
  1. Exterior Walls: Hot-dip galvanized, carbon steel.
  2. Wire Size for Side Rods: 0.148-inch (3.77-mm) diameter.
  3. Wire Size for Cross Rods: 0.148-inch (3.77-mm) diameter.
  4. Wire Size for Veneer Ties: 0.148-inch (3.77-mm) diameter.
  5. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches (407 mm) o.c.
  6. Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units.
- C. Masonry Joint Reinforcement for Multiwythe Masonry:
  1. Adjustable (two-piece) type, either ladder or truss design, with one side rod at each face shell of backing wythe and with separate adjustable ties with pintle-and-eye connections having a maximum adjustment of 1-1/4 inches (32 mm). Size ties to extend at least halfway through facing wythe but with at least 5/8-inch (16-mm) cover on outside face. Ties have hooks or clips to engage a continuous horizontal wire in the facing wythe.

## 2.6 TIES AND ANCHORS

- A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated.
  1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M; with ASTM A 153/A 153M, Class B-2 coating.
  2. Galvanized Steel Sheet: ASTM A 653/A 653M, Commercial Steel, G60 (Z180) zinc coating.

- B. Corrugated Metal Ties: Metal strips not less than 7/8 inch (22 mm) wide with corrugations having a wavelength of 7.6 to 12.7 mm and an amplitude of 0.06 to 0.10 inch (1.5 to 2.5 mm) made from 0.030-inch- (0.76-mm-) thick, steel sheet, galvanized after fabrication.
- C. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

## 2.7 MISCELLANEOUS ANCHORS

- A. Anchor Bolts: Headed or L-shaped steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153/A 153M, Class C; of dimensions indicated.

## 2.8 EMBEDDED FLASHING MATERIALS

- A. Flexible Flashing: Use the following unless otherwise indicated:
  - 1. Asphalt-Coated Copper Flashing: 7-oz./sq. ft. (2-kg/sq. m) copper sheet coated with flexible asphalt. Use only where flashing is fully concealed in masonry.
    - a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      - 1) Advanced Building Products Inc.; Cop-R-Cote.
      - 2) Dayton Superior Corporation, Dur-O-Wal Division; Copper Coated Thru-Wall Flashing.
      - 3) Hohmann & Barnard, Inc.; H & B C-Coat Flashing.
      - 4) Phoenix Building Products; Type ACC-Asphalt Bituminous Coated.
      - 5) Sandell Manufacturing Co., Inc.; Coated Copper Flashing.
- B. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

## 2.9 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene or urethane.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

- C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).
- D. Weep/Vent Products: Use the following unless otherwise indicated:
1. Wicking Material: Absorbent rope, made from cotton, 1/4 to 3/8 inch (6 to 10 mm) in diameter, in length required to produce 2-inch (50-mm) exposure on exterior and 18 inches (450 mm) in cavity. Use only for weeps.
- E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following]:
    - a. Advanced Building Products Inc.; Mortar Break.
    - b. Archovations, Inc.; CavClear Masonry Mat.
    - c. Dayton Superior Corporation, Dur-O-Wal Division; Polytite MortarStop.
    - d. Mortar Net USA, Ltd.; Mortar Net.
  2. Provide one of the following configurations:
    - a. Sheets or strips not less than 1 inch (25 mm) thick and installed to full height of cavity with additional strips 4 inches (100 mm) high at weep holes and thick enough to fill entire depth of cavity and prevent weep holes from clogging with mortar.
- F. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and hold reinforcing bars in center of cells. Units are formed from 0.148-inch (3.77-mm) steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Dayton Superior Corporation, Dur-O-Wal Division; D/A 810, D/A 812 or D/A 817.
    - b. Heckmann Building Products Inc.; No. 376 Rebar Positioner.
    - c. Hohmann & Barnard, Inc.; #RB or #RB-Twin Rebar Positioner.
    - d. Wire-Bond; O-Ring or Double O-Ring Rebar Positioner.

## 2.10 MASONRY-CELL INSULATION

- A. Masonry Cell Foam Insulation: Two component system consisting of an amino-plast resin and a catalyst foaming agent surfactant.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

- a. Taylor Chemical Products; Core-fill 500.

## 2.11 BITUMINOUS DAMPROOFING

- A. Cold-Applied Asphalt Emulsion Dampproofing: Asphalt based emulsions recommended by the manufacturer for damproofing use when applied to the manufacturer's instructions.
  1. Spray Grade: Emulsified asphalt, prepared with mineral colloid emulsifying agents without fibrous reinforcement, complying with ASTM D 1227, Type III.
- B. Available Manufacturer's: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work included, but are not limited to, the following:
  1. ChemRex, Inc.; Sonneform Building Products Div.
  2. Euclid Chemical Co.
  3. Karnak Chemical Corporation.
  4. Koppers Industries, Inc.

## 2.12 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
  1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Diedrich Technologies, Inc.
    - b. EaCo Chem, Inc.
    - c. ProSoCo, Inc.

## 2.13 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
  1. Do not use calcium chloride in mortar or grout.
- B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.
  1. For masonry below grade or in contact with earth, use Type S.

2. For reinforced masonry, use Type S.
  3. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type N.
  4. For interior non-load-bearing partitions, Type O may be used instead of Type N.
- C. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required.
1. Pigments shall not exceed 10 percent of portland cement by weight.
  2. Mix to match Architect's sample.
  3. Application: Use pigmented mortar for exposed mortar joints with the following units:
    - a. Face brick.
- D. Grout for Unit Masonry: Comply with ASTM C 476.
1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
  2. Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi (14 MPa).
  3. Provide grout with a slump of 8 to 11 inches (203 to 279 mm) as measured according to ASTM C 143/C 143M.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
  2. Verify that foundations are within tolerances specified.
  3. Verify that reinforcing dowels are properly placed.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION, GENERAL**

- A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

- B. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
- C. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- D. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.
  - 1. Mix units from several pallets or cubes as they are placed.
- E. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.
- F. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

### 3.3 TOLERANCES

- A. Dimensions and Locations of Elements:
  - 1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
  - 2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
  - 3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.
- B. Lines and Levels:
  - 1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.
  - 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
  - 3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.
  - 4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
  - 5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.

6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.5 mm) except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3 mm).
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch (1.5 mm) from one masonry unit to the next.

### 3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4-inches (100-mm). Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.

- H. Fill cores in hollow CMUs with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
- I. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.
  - 1. Install compressible filler in joint between top of partition and underside of structure above.
  - 2. Wedge non-load-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
  - 3. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 078446 "Fire-Resistive Joint Systems."

### 3.5 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
  - 1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
  - 2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
  - 3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
  - 4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.
- B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
  - 1. For glazed masonry units, use a nonmetallic jointer 3/4 inch (19 mm) or more in width.

### 3.6 CAVITY WALLS

- A. Bond wythes of cavity walls together using one of the following methods:
  - 1. Individual Metal Ties: Provide ties as shown installed in horizontal joints, but not less than one metal tie for 1.77 sq. ft. (0.16 sq. m) of wall area spaced not to exceed 16 inches (406 mm) o.c. horizontally and 16 inches (406 mm) o.c. vertically. Stagger ties in alternate courses. Provide additional ties within 12 inches (305 mm) of openings and space not more than 36 inches (915 mm) apart around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24 inches (610 mm) o.c. vertically.

- a. Where bed joints of wythes do not align, use adjustable (two-piece) type ties.
  - b. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable (two-piece) type ties to allow for differential movement regardless of whether bed joints align.
2. Masonry Joint Reinforcement: Installed in horizontal mortar joints.
- a. Where bed joints of both wythes align, use ladder-type reinforcement extending across both wythes.
  - b. Where bed joints of wythes do not align, use adjustable (two-piece) type reinforcement with continuous horizontal wire in facing wythe attached to ties.
  - c. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable (two-piece) type reinforcement with continuous horizontal wire in facing wythe attached to ties to allow for differential movement regardless of whether bed joints align.
3. Header Bonding: Provide masonry unit headers extending not less than 3 inches (76 mm) into each wythe. Space headers not over 8 inches (203 mm) clear horizontally and 16 inches (406 mm) clear vertically.
4. Masonry Veneer Anchors: Comply with requirements for anchoring masonry veneers.
- B. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.
- C. Coat cavity face of backup wythe to comply with damproofing as specified in this section.

### **3.7 MASONRY-CELL INSULATION**

- A. Install masonry cell foam insulation after concrete masonry wall has been fully erected, following manufacturer's recommendations. Mix foam insulation. Drill a series of small holes into the mortar joints of the wall. Fill all masonry cells in a series of lifts. Patch holes after completion.

### **3.8 MASONRY JOINT REINFORCEMENT**

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).
1. Space reinforcement not more than 16 inches (406 mm) o.c.
  2. Space reinforcement not more than 8 inches (203 mm) o.c. in foundation walls and parapet walls.

3. Provide reinforcement not more than 8 inches (203 mm) above and below wall openings and extending 12 inches (305 mm) beyond openings in addition to continuous reinforcement.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
  - C. Provide continuity at wall intersections by using prefabricated T-shaped units.
  - D. Provide continuity at corners by using prefabricated L-shaped units.
  - E. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

### **3.9 ANCHORING MASONRY VENEERS**

- A. Anchor masonry veneers to existing walls and concrete and masonry backup with masonry-veneer anchors to comply with the following requirements:
  1. Embed tie sections in masonry joints. Provide not less than 2 inches (50 mm) of air space between back of masonry veneer and face of sheathing.
  2. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
  3. Space anchors as indicated, but not more than 16 inches (406 mm) o.c. vertically and 24 inches (610 mm) o.c. horizontally with not less than 1 anchor for each 3.5 sq. ft. (0.33 sq. m) of wall area. Install additional anchors within 12 inches (305 mm) of openings and at intervals, not exceeding 36 inches (914 mm), around perimeter.

### **3.10 CONTROL AND EXPANSION JOINTS**

- A. General: Install control and expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form control joints in concrete masonry as follows:
  1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout and rake out joints in exposed faces for application of sealant.
- C. Form expansion joints in brick as follows:
  1. Build flanges of metal expansion strips into masonry. Lap each joint 4 inches (100 mm) in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints if any.

### 3.11 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.
- B. Install flashing as follows unless otherwise indicated:
  - 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
  - 2. At multiwythe masonry walls, including cavity walls, extend flashing through outer wythe, turned up a minimum of 8 inches (200 mm), and through inner wythe to within 1/2 inch (13 mm) of the interior face of wall in exposed masonry. Where interior face of wall is to receive furring or framing, carry flashing completely through inner wythe and turn flashing up approximately 2 inches (50 mm) on interior face.
  - 3. At masonry-veneer walls, extend flashing through veneer, across air space behind veneer, and up face of sheathing at least 8 inches (200 mm); with upper edge tucked under building paper or building wrap, lapping at least 4 inches (100 mm).
  - 4. At lintels and shelf angles, extend flashing a minimum of 6 inches (150 mm) into masonry at each end. At heads and sills, extend flashing 6 inches (150 mm) at ends and turn up not less than 2 inches (50 mm) to form end dams.
  - 5. Interlock end joints of ribbed sheet metal flashing by overlapping ribs not less than 1-1/2 inches (38 mm) or as recommended by flashing manufacturer, and seal lap with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.
  - 6. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch (13 mm) back from outside face of wall and adhere flexible flashing to top of metal drip edge.
  - 7. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.
- C. Install weep holes in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:
  - 1. Use wicking material to form weep holes above flashing under brick sills. Turn wicking down at lip of sill to be as inconspicuous as possible.
  - 2. Space weep holes formed from wicking material 32 inches (800 mm) o.c.
  - 3. Trim wicking material flush with outside face of wall after mortar has set.
- D. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.

### 3.12 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
  2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
  2. Limit height of vertical grout pours to not more than 60 inches (1520 mm).

### **3.13 FIELD QUALITY CONTROL**

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
- B. Inspections: Level 1 special inspections according to the "International Building Code."
1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
  2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
  3. Place grout only after inspectors have verified proportions of site-prepared grout.
- C. Testing Prior to Construction: One set of tests.
- D. Testing Frequency: One set of tests for each 5000 sq. ft. (464 sq. m) of wall area or portion thereof.
- E. Clay Masonry Unit Test: For each type of unit provided, according to ASTM C 67 for compressive strength.
- F. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.

### **3.14 REPAIRING, POINTING, AND CLEANING**

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
  - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
  - 3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
  - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
  - 5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
  - 6. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
  - 7. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

### **3.15 MASONRY WASTE DISPOSAL**

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
- C. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

**END OF SECTION**

**055000****METAL FABRICATIONS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Elevator machine beams, hoist beams.
  - 2. Steel shapes for supporting elevator door sills.
  - 3. Metal ladders.
  - 4. Elevator pit sump covers.
  - 5. Decorative railings.
  - 6. Loose bearing and leveling plates for applications where they are not specified in other Sections.
- B. Products furnished, but not installed, under this Section include the following:
  - 1. Loose steel lintels.
  - 2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
- C. Related Requirements:
  - 1. Section 033000 "Cast-in-Place Concrete" for installing anchor bolts, steel pipe sleeves, slotted-channel inserts, wedge-type inserts, and other items cast into concrete.
  - 2. Section 042000 "Unit Masonry" for installing loose lintels, anchor bolts, and other items built into unit masonry.

**1.3 COORDINATION**

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that

are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For the following:
  - 1. Nonslip aggregates and nonslip-aggregate surface finishes.
  - 2. Grout.
  
- B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:
  - 1. Elevator machine beams, hoist beams.
  - 2. Steel shapes for supporting elevator door sills.
  - 3. Metal ladders.
  - 4. Elevator pit sump covers.
  - 5. Guardrails and hand railings.
  - 6. Loose steel lintels.

#### **1.5 INFORMATIONAL SUBMITTALS**

- A. Welding certificates.

#### **1.6 QUALITY ASSURANCE**

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

#### **1.7 FIELD CONDITIONS**

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

### **PART 2 - PRODUCTS**

#### **2.1 PERFORMANCE REQUIREMENTS**

- A. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  - 1. Handrails and Top Rails of Guards:
    - a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.

- b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
  - c. Uniform and concentrated loads need not be assumed to act concurrently.
2. Infill of Guards:
- a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
  - b. Infill load and other loads need not be assumed to act concurrently.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
- 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C, material surfaces).

## **2.2 METALS**

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- C. Tubing: ASTM A 500 (cold formed).
- D. Bars: Hot-rolled, carbon steel complying with ASTM A 29/A 29M, Grade 1010.
- E. Plates, Shapes, and Bars: ASTM A 36/A 36M.

## **2.3 FASTENERS**

- A. General: Unless otherwise indicated, provide Type 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
- C. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 325, Type 3 (ASTM A 325M, Type 3); with hex nuts, ASTM A 563, Grade C3 (ASTM A 563M, Class 8S3); and, where indicated, flat washers.
- D. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593 (ASTM F 738M); with hex nuts, ASTM F 594 (ASTM F 836M); and, where indicated, flat washers; Alloy Group 1 (A1).

- E. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
  - 1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- F. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
- G. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.
- H. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
  - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
  - 2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).

## 2.4 MISCELLANEOUS MATERIALS

- A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
  - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- B. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
- C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.
- D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

## 2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches (3.2 by 38 mm), with a minimum 6-inch (150-mm) embedment and 2-inch (50-mm) hook, not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c., unless otherwise indicated.

## **2.6 MISCELLANEOUS FRAMING AND SUPPORTS**

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
  - 1. Furnish inserts for units installed after concrete is placed.

## 2.7 METAL LADDERS

### A. General:

1. For elevator pit ladders, comply with ASME A17.1/CSA B44.

### B. Steel Ladders:

1. Space siderails 18 inches (457 mm) apart unless otherwise indicated.
2. Siderails: Continuous, 1/2-by-2-1/2-inch (12.7-by-64-mm) steel flat bars, with eased edges.
3. Rungs: 3/4-inch- (19-mm-) diameter steel bars.
4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
5. Provide nonslip surfaces on top of each rung, either by coating rung with aluminum-oxide granules set in epoxy-resin adhesive or by using a type of manufactured rung filled with aluminum-oxide grout.
6. Support each ladder at top and bottom and not more than 60 inches (1500 mm) o.c. with welded or bolted steel brackets.
7. Prime ladders, including brackets and fasteners, with universal shop primer.

## 2.8 ELEVATOR PIT SUMP COVERS

- A. Fabricate from welded or pressure-locked swage steel bar grating Limit openings in gratings to no more than 1 inch (25 mm) in least dimension.
- B. Provide steel angle supports as indicated.

## 2.9 DECORATIVE RAILINGS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Julius Blum & Co., Inc. or comparable product by one of the following:
  1. Architectural Iron Designs, Inc.
  2. Artezzi.
  3. Bavarian Iron Works Co.
  4. Braun, J. G., Company.
  5. Lawler Foundry Corporation.
  6. Livers Bronze Co.
  7. Olin Wrought Iron.
  8. Wagner, R & B, Inc.
- B. Source Limitations: Obtain all components of decorative railing system, from single manufacturer.

## 2.10 LOOSE BEARING AND LEVELING PLATES

- A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

- B. Prime plates with zinc-rich primer.

## **2.11 LOOSE STEEL LINTELS**

- A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.
- B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span, but not less than 8 inches (200 mm) unless otherwise indicated.
- C. Prime loose steel lintels located in exterior walls with zinc-rich primer.

## **2.12 STEEL WELD PLATES AND ANGLES**

- A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

## **2.13 FINISHES, GENERAL**

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

## **2.14 STEEL AND IRON FINISHES**

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
  - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.
- C. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
  - 1. Shop prime with universal shop primer unless zinc-rich primer is indicated.
- D. Preparation for Shop Priming: Prepare surfaces to comply with the following:

1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
  2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
  3. Other Items: SSPC-SP 3, "Power Tool Cleaning."
- E. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION, GENERAL**

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  2. Obtain fusion without undercut or overlap.
  3. Remove welding flux immediately.
  4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
1. Cast Aluminum: Heavy coat of bituminous paint.
  2. Extruded Aluminum: Two coats of clear lacquer.

**3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS**

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

**3.3 INSTALLING BEARING AND LEVELING PLATES**

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with nonshrink grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

**3.4 ADJUSTING AND CLEANING**

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
  - 1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

**END OF SECTION**

**061000****ROUGH CARPENTRY****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Wood blocking, cants, and nailers.

**1.3 DEFINITIONS**

- A. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.
- B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
  - 1. NeLMA: Northeastern Lumber Manufacturers' Association.
  - 2. NLGA: National Lumber Grades Authority.
  - 3. SPIB: The Southern Pine Inspection Bureau.

**1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
  - 2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
  - 3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

## 1.5 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
- B. Evaluation Reports: For the following, from ICC-ES:
  - 1. Wood-preservative-treated wood.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

## PART 2 - PRODUCTS

### 2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
  - 3. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal (38-mm actual) thickness or less, 19 percent for more than 2-inch nominal (38-mm actual) thickness unless otherwise indicated.

### 2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWPAC U1; Use Category UC3b for exterior construction not in contact with the ground.
  - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
  - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

### 2.3 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  - 1. Blocking.
  - 2. Nailers.
  - 3. Cants.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber and any of the following species:
  - 1. Mixed southern pine; SPIB.
  - 2. Spruce-pine-fir; NLGA.
  - 3. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

### 2.4 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
  - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M or of Type 304 stainless steel.
- B. Power-Driven Fasteners: NES NER-272.
- C. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.
- D. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
  - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION, GENERAL**

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- D. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
  - 1. Use inorganic boron for items that are continuously protected from liquid water.
- E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

### **3.2 WOOD SLEEPER, BLOCKING, AND NAILER INSTALLATION**

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

### **3.3 PROTECTION**

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes sufficiently wet that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

**END OF SECTION**

**071326****SELF-ADHERING SHEET WATERPROOFING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Modified bituminous sheet waterproofing.
- B. Related Requirements:
  - 1. Section 071700 "Bentonite Waterproofing" for additional components of the foundation waterproofing system.

**1.3 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review waterproofing requirements including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

**1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
  - 2. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.
- B. Shop Drawings: Show locations and extent of waterproofing and details of substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.
  - 1. Include setting drawings showing layout, sizes, sections, profiles, and joint details of pedestal-supported concrete pavers.

**1.5 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer.
- B. Field quality-control reports.
- C. Sample Warranties: For special warranties.

**1.6 QUALITY ASSURANCE**

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.

**1.7 FIELD CONDITIONS**

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.
  - 1. Do not apply waterproofing in snow, rain, fog, or mist.
- B. Maintain adequate ventilation during preparation and application of waterproofing materials.

**1.8 WARRANTY**

- A. Manufacturer's Warranty: Manufacturer's standard materials-only warranty in which manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.
  - 1. Warranty Period: Five years from date of Substantial Completion.

**PART 2 - PRODUCTS****2.1 MATERIALS, GENERAL**

- A. Source Limitations for Waterproofing System: Obtain waterproofing materials, and protection course from single source from single manufacturer.

**2.2 MODIFIED BITUMINOUS SHEET WATERPROOFING**

- A. Modified Bituminous Sheet: Minimum 60-mil (1.5-mm) nominal thickness, self-adhering sheet consisting of 56 mils (1.4 mm) of rubberized asphalt laminated on one side to a 4-mil- (0.10-mm-) thick, polyethylene-film reinforcement, and with release liner

on adhesive side; formulated for application with primer or surface conditioner that complies with VOC limits of authorities having jurisdiction.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Carlisle Coatings & Waterproofing Inc; CCW MiraDRI 860/861.
  - b. Grace Construction Products; W.R. Grace & Co. -- Conn; Bituthene 3000/Low Temperature.
  - c. Henry Company; Blueskin WP 100/200.
  - d. Meadows, W.R.,Inc; SealTight Mel-Rol.
  - e. Polyguard Products, Inc; Polyguard 650.
  - f. Tamko Building Products, Inc; TW-60.
  - g. York Manufacturing, Inc; HydroGard.
2. Physical Properties:
  - a. Tensile Strength, Membrane: 250 psi (1.7 MPa) minimum; ASTM D 412, Die C, modified.
  - b. Ultimate Elongation: 300 percent minimum; ASTM D 412, Die C, modified.
  - c. Low-Temperature Flexibility: Pass at minus 20 deg F (minus 29 deg C); ASTM D 1970.
  - d. Crack Cycling: Unaffected after 100 cycles of 1/8-inch (3-mm) movement; ASTM C 836.
  - e. Puncture Resistance: 40 lbf (180 N) minimum; ASTM E 154.
  - f. Water Absorption: 0.2 percent weight-gain maximum after 48-hour immersion at 70 deg F (21 deg C); ASTM D 570.
  - g. Water Vapor Permeance: 0.05 perms (2.9 ng/Pa x s x sq. m) maximum; ASTM E 96/E 96M, Water Method.
  - h. Hydrostatic-Head Resistance: 200 feet (60 m) minimum; ASTM D 5385.
3. Sheet Strips: Self-adhering, rubberized-asphalt strips of same material and thickness as sheet waterproofing.

### **2.3 AUXILIARY MATERIALS**

- A. General: Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.
  1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.
- B. Primer: Liquid waterborne primer recommended for substrate by sheet-waterproofing material manufacturer.
- C. Surface Conditioner: Liquid, waterborne surface conditioner recommended for substrate by sheet-waterproofing material manufacturer.
- D. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.

- E. Substrate Patching Membrane: Low-viscosity, two-component, modified asphalt coating.
- F. Metal Termination Bars: Aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick, predrilled at 9-inch (229-mm) centers.
- G. Protection Course: Extruded-polystyrene board insulation, unfaced, ASTM C 578, Type X, 1/2 inch (13 mm) thick.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the waterproofing.
  - 1. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.
  - 2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
  - 3. Verify that compacted subgrade is dry, smooth, sound, and ready to receive waterproofing sheet.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 SURFACE PREPARATION**

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
- B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.
- E. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.
- F. Bridge and cover isolation joints and expansion joints with overlapping sheet strips of widths according to manufacturer's written instructions.
  - 1. Invert and loosely lay first sheet strip over center of joint. Firmly adhere second sheet strip to first and overlap to substrate.

- G. Corners: Prepare, prime, and treat inside and outside corners according to ASTM D 6135.
  - 1. Install membrane strips centered over vertical inside corners. Install 3/4-inch (19-mm) fillets of liquid membrane on horizontal inside corners and as follows:
    - a. At footing-to-wall intersections, extend liquid membrane in each direction from corner or install membrane strip centered over corner.
- H. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions according to ASTM D 6135.

### **3.3 MODIFIED BITUMINOUS SHEET-WATERPROOFING APPLICATION**

- A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions and recommendations in ASTM D 6135.
- B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.
- C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- (64-mm-) minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure watertight installation.
  - 1. When ambient and substrate temperatures range between 25 and 40 deg F (minus 4 and plus 5 deg C), install self-adhering, modified bituminous sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F (16 deg C).
- D. Two-Ply Application: Install sheets to form a membrane with lap widths not less than 50 percent of sheet widths, to provide a minimum of two thicknesses of sheet membrane over areas to receive waterproofing.
- E. Horizontal Application: Apply sheets from low to high points of decks to ensure that laps shed water.
- F. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.
- G. Seal edges of sheet-waterproofing terminations with mastic.
- H. Install sheet-waterproofing and auxiliary materials to tie into adjacent waterproofing.
- I. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches (150 mm) beyond repaired areas in all directions.
- J. Immediately install protection course with butted joints over waterproofing membrane.

**3.4 PROTECTION, REPAIR, AND CLEANING**

- A. Do not permit foot or vehicular traffic on unprotected membrane.
- B. Protect waterproofing from damage and wear during remainder of construction period.
- C. Protect installed board insulation from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
- D. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- E. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

**END OF SECTION**

**071700****BENTONITE WATERPROOFING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Bentonite waterproofing.
- B. Related Sections:
  - 1. Section 033000 "Cast-in-Place Concrete" for forms, waterstops, and concrete placement.

**1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated. Include product specifications and manufacturer's written installation instructions.
- B. Shop Drawings: Show installation details for interface with other work.

**1.4 INFORMATIONAL SUBMITTALS**

- A. Material Certificates: For each type of bentonite waterproofing, from manufacturer.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for bentonite waterproofing.
- C. Field quality-control reports.
- D. Warranty: Sample of special warranty.

**1.5 QUALITY ASSURANCE**

- A. Source Limitations: Obtain bentonite waterproofing system from single source from single manufacturer. Obtain accessory products used with bentonite waterproofing from sources acceptable to bentonite waterproofing manufacturer.

- B. Preinstallation Conference: Conduct conference at Project site.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's original unopened and undamaged containers.
- B. Store materials in a dry, well-ventilated space.
- C. Remove and replace bentonite materials that have been prematurely exposed to moisture.

## 1.7 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit bentonite waterproofing to be installed according to manufacturers' written instructions and warranty requirements.
  - 1. Do not apply waterproofing materials to surfaces where ice or frost is visible. Do not apply bentonite waterproofing materials in areas with standing water.
  - 2. Placing bentonite clay products in panel or composite form on damp surfaces is allowed if approved in writing by manufacturer.

## 1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer[ **and Installer**] agree(s) to repair or replace components of bentonite waterproofing system that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 BENTONITE PANELS

- A. Standard Panels: 3/16-inch- (5-mm-) thick, corrugated kraft-paper panels with a minimum of 1.0 lb/sq. ft. (5 kg/sq. m) of bentonite confined in corrugations of boards.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. CETCO; Volclay Type 1.

## **2.2 INSTALLATION ACCESSORIES**

- A. Granular Bentonite: Sodium bentonite clay containing a minimum of 90 percent montmorillonite (hydrated aluminum silicate), with a minimum of 90 percent passing a No. 20 (0.85-mm) sieve.
- B. Bentonite Mastic: Trowelable consistency, bentonite compound, specifically formulated for application at joints and penetrations.
- C. Granular Bentonite Tubes: Manufacturer's standard 2-inch- (50-mm-) diameter, water-soluble tube containing approximately 1.5 lb/ft. (2.2 kg/m) of bentonite; hermetically sealed; designed specifically for placing on wall footings at line of joint with exterior base of wall.
- D. Termination Bar: Extruded-aluminum or formed-stainless-steel bars with upper flange to receive sealant.
- E. Plastic Protection Sheet: Polyethylene sheeting complying with ASTM D 4397; thickness recommended by waterproofing manufacturer to suit application but at least 6 mils (0.15 mm) thick.
- F. Cement Grout Patching Material: Manufacturer's recommended grout mix compatible with substrate being patched.
- G. Masonry Fasteners: Case-hardened nails or hardened-steel, powder-actuated fasteners. Depending on manufacturer's written requirements, provide 1/2- or 1-inch- (13- or 25-mm-) diameter washers under fastener heads.
- H. Tapes: Waterproofing manufacturer's recommended tape for joints between sheets, membranes, or panels.
- I. Adhesive: Water-based adhesive used to secure waterproofing to both vertical and horizontal surfaces.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrate preparations affecting performance of bentonite waterproofing.
- B. Verify that substrate is complete and that work that will penetrate waterproofing is complete and rigidly installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. Coordinate work in the vicinity of waterproofing to ensure proper conditions for installing the waterproofing system and to prevent damage to waterproofing after installation.
- B. Formed Concrete Surfaces: Remove fins and projections. Fill voids, rock pockets, form-tie holes, and other defects with bentonite mastic or cement grout patching material according to manufacturer's written instructions.
- C. Excavation Support and Protection System: If water is seeping, use plastic protection sheets or other suitable means to prevent wetting the bentonite waterproofing. Fill minor gaps and spaces 1/8 inch (3 mm) wide or wider with wood, metal, concrete, or other appropriate filling material. Cover or fill large voids and crevices with cement mortar according to manufacturer's written instructions.

### **3.3 INSTALLATION, GENERAL**

- A. Install waterproofing and accessories according to manufacturer's written instructions.
  - 1. Apply granular bentonite around penetrations in horizontal surfaces and changes in plane according to manufacturer's details in preparation for granular bentonite tubes and mastic.
  - 2. Apply granular bentonite tubes, bentonite mastic, or both at changes of plane, construction joints in substrate, projections, and penetrations.
- B. Apply granular bentonite tubes continuously on footing against base of wall to be waterproofed according to manufacturer's written instructions.
- C. Protect waterproofing from damage and wetting before and during subsequent construction operations. Repair punctures, tears, and cuts according to manufacturer's written instructions.

### **3.4 BENTONITE PANEL INSTALLATION**

- A. General: Install a continuous layer of bentonite waterproofing panels with ends and edges lapped a minimum of 1-1/2 inches (38 mm) unless otherwise indicated. Stagger joints in adjoining panel rows.
  - 1. Install a double layer of waterproofing panels, with ends and edges butted instead of lapped and with second layer of joints staggered over first. Staple panels together to hold them in place.
- B. Concrete Walls: Starting at bottom of wall, apply waterproofing panels with ends and edges lapped and with vertical joints staggered. Secure with fasteners or adhesive recommended in writing by manufacturer. Extend to bottom of footing, grade beam, or wall.

1. Horizontal-to-Vertical Transitions: Install granular bentonite tubes immediately before backfilling and compact backfill over the joint.
2. Termination at Grade: Extend waterproofing panels to within **2 inches (50 mm)** of finish grade unless otherwise indicated. Secure top edge with termination bar. Apply sealant to top edge of termination bar.
3. Termination at Grade: Fasten top edge of waterproofing panels to wall and protect top edge with sheet metal counterflashing.
4. Cover waterproofing panels with a lapped course of plastic protection sheets; remove plastic sheets before backfilling.

**END OF SECTION**

**075323****ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) ROOFING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Adhered ethylene-propylene-diene-monomer (EPDM) roofing system.
  - 2. Roof insulation.
- B. Related Requirements:
  - 1. Section 061000 "Rough Carpentry" for wood nailers, curbs, and blocking.

**1.3 DEFINITIONS**

- A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

**1.4 PREINSTALLATION MEETINGS**

- A. Preinstallation Roofing Conference: Conduct conference at Project site.
  - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
  - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
  - 3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
  - 5. Review structural loading limitations of roof deck during and after roofing.
  - 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.

7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

### **1.5 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work, including:
  1. Base flashings and membrane terminations.
  2. Tapered insulation, including slopes.
  3. Roof plan showing orientation of steel roof deck and orientation of roofing and fastening spacings and patterns for mechanically fastened roofing.
  4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

### **1.6 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer and manufacturer.
- B. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
  1. Submit evidence of complying with performance requirements.
- C. Product Test Reports: For components of roofing system, tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Research/Evaluation Reports: For components of roofing system, from ICC-ES.
- E. Field quality-control reports.
- F. Sample Warranties: For manufacturer's special warranties.

### **1.7 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For roofing system to include in maintenance manuals.

### **1.8 QUALITY ASSURANCE**

- A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

## **1.9 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
  - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

## **1.10 FIELD CONDITIONS**

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

## **1.11 WARRANTY**

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
  - 1. Special warranty includes membrane roofing, base flashings, roof insulation, fasteners, roofing accessories, and other components of roofing system.
  - 2. Warranty Period: 20 years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Source Limitations: Obtain components including roof insulation, fasteners for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.
- B. Manufacturer's Qualifications: Manufacturer of products shall have more than 20 years of experience manufacturing products supplied.

## 2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and base flashings shall remain watertight.
  - 1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
  - 2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.
- B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. Roofing System Design: Tested by a qualified testing agency to resist the following uplift pressures:
  - 1. Corner Uplift Pressure: 68.6 lbf/sq. ft. (kPa/sq. m).
  - 2. Perimeter Uplift Pressure: 45.5 lbf/sq. ft. (kPa/sq. m).
  - 3. Field-of-Roof Uplift Pressure: 27.7 lbf/sq. ft. (kPa/sq. m).

## 2.3 EPDM ROOFING

- A. EPDM: ASTM D 4637, Type I, nonreinforced, uniform, flexible EPDM sheet.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following (no exceptions):
    - a. Carlisle SynTec Incorporated.
    - b. Firestone Building Products.
  - 2. Thickness: 60 mils (1.5 mm), nominal.
  - 3. Exposed Face Color: Black.

## 2.4 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.
  - 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
  - 2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the following limits for VOC content:
    - a. Plastic Foam Adhesives: 50 g/L.
    - b. Gypsum Board and Panel Adhesives: 50 g/L.
    - c. Multipurpose Construction Adhesives: 70 g/L.

- d. Fiberglass Adhesives: 80 g/L.
  - e. Single-Ply Roof Membrane Adhesives: 250 g/L.
  - f. Single-Ply Roof Membrane Sealants: 450 g/L.
  - g. Nonmembrane Roof Sealants: 300 g/L.
  - h. Sealant Primers for Nonporous Substrates: 250 g/L.
  - i. Sealant Primers for Porous Substrates: 775 g/L.
  - j. Other Adhesives and Sealants: 250 g/L.
3. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- B. Sheet Flashing: 60-mil- (1.5-mm-) thick EPDM, partially cured or cured, according to application.
  - C. Bonding Adhesive: Manufacturer's standard, water based.
  - D. Seaming Material: Manufacturer's standard, synthetic-rubber polymer primer and 3-inch- (75-mm-) wide minimum, butyl splice tape with release film.
  - E. Lap Sealant: Manufacturer's standard, single-component sealant, colored to match membrane roofing.
  - F. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.
  - G. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick; with anchors.
  - H. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening membrane to substrate, and acceptable to roofing system manufacturer.
  - I. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, molded pipe boot flashings, preformed inside and outside corner sheet flashings, reinforced EPDM securement strips, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories.

## 2.5 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by EPDM roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 3, felt or glass-fiber mat facer on both major surfaces.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Atlas Roofing Corporation.
  - b. Carlisle SynTec Incorporated.
  - c. Firestone Building Products.
  - d. Rmax, Inc.
- C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48). Thickness to be minimum 3" at roof edge.

## **2.6 INSULATION ACCESSORIES**

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with roofing.
- B. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
  1. Full-spread spray-applied, low-rise, two-component urethane adhesive.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work:
  1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
  2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
  3. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
  4. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
  5. Verify that concrete-curing compounds that will impair adhesion of roofing components to roof deck have been removed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

### **3.3 ROOFING INSTALLATION, GENERAL**

- A. Install roofing system according to roofing system manufacturer's written instructions.
- B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

### **3.4 INSULATION INSTALLATION**

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Install tapered insulation under area of roofing to conform to slopes indicated.
- D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (68 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
  - 1. Where installing composite and noncomposite insulation in two or more layers, install noncomposite board insulation for bottom layer and intermediate layers, if applicable, and install composite board insulation for top layer.
- E. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
  - 1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
- F. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:
  - 1. Prime surface of concrete deck with asphalt primer at rate of 3/4 gal./100 sq. ft. (0.3 L/sq. m), and allow primer to dry.
  - 2. Set each layer of insulation in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F (14 deg C) of equiviscous temperature.
  - 3. Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
  - 4. Set each layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

### 3.5 ADHERED MEMBRANE ROOFING INSTALLATION

- A. Adhere roofing over area to receive roofing according to membrane roofing system manufacturer's written instructions. Unroll membrane roofing and allow to relax before installing.
- B. Start installation of roofing in presence of roofing system manufacturer's technical personnel.
- C. Accurately align roofing, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Bonding Adhesive: Apply to substrate and underside of roofing at rate required by manufacturer, and allow to partially dry before installing roofing. Do not apply to splice area of roofing.
- E. Apply roofing with side laps shingled with slope of roof deck where possible.
- F. Adhesive Seam Installation: Clean both faces of splice areas, apply splicing cement, and firmly roll side and end laps of overlapping roofing according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of roofing terminations.
  - 1. Apply a continuous bead of in-seam sealant before closing splice if required by roofing system manufacturer.
- G. Tape Seam Installation: Clean and prime both faces of splice areas, apply splice tape, and firmly roll side and end laps of overlapping roofing according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of roofing terminations.
- H. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.

### 3.6 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

**3.7 FIELD QUALITY CONTROL**

- A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
- B. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

**3.8 PROTECTING AND CLEANING**

- A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates, and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

**END OF SECTION**

**079200****JOINT SEALANTS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Urethane joint sealants.
  - 2. Latex joint sealants.
- B. Related Sections:
  - 1. Section 042000 "Unit Masonry" for masonry control and expansion joint fillers and gaskets.

**1.3 ACTION SUBMITTALS**

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Joint-Sealant Schedule: Include the following information:
  - 1. Joint-sealant application, joint location, and designation.
  - 2. Joint-sealant manufacturer and product name.
  - 3. Joint-sealant formulation.
  - 4. Joint-sealant color.

**1.4 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For qualified Installer.
- B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.
- C. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.

- D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
- E. Warranties: Sample of special warranties.

### **1.5 QUALITY ASSURANCE**

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.
- C. Product Testing: Test joint sealants using a qualified testing agency.
  - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
  - 2. Test according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.

### **1.6 PROJECT CONDITIONS**

- A. Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
  - 2. When joint substrates are wet.
  - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
  - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

### **1.7 WARRANTY**

- A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: 20 years from date of Substantial Completion.

- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
  2. Disintegration of joint substrates from natural causes exceeding design specifications.
  3. Mechanical damage caused by individuals, tools, or other outside agents.
  4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS, GENERAL**

- A. **Compatibility:** Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. **VOC Content of Interior Sealants:** Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
1. Architectural Sealants: 250 g/L.
  2. Sealant Primers for Nonporous Substrates: 250 g/L.
  3. Sealant Primers for Porous Substrates: 775 g/L.
- C. **Liquid-Applied Joint Sealants:** Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
1. **Suitability for Immersion in Liquids.** Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.
- D. **Stain-Test-Response Characteristics:** Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- E. **Colors of Exposed Joint Sealants:** As selected by Architect from manufacturer's full range.

## 2.2 URETHANE JOINT SEALANTS

- A. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. BASF Building Systems; Sonolastic NP1.
    - b. Bostik, Inc.; Chem-Calk 900.
    - c. Pecora Corporation; Dynatrol I-XL.
    - d. Polymeric Systems, Inc.; Flexiprene 1000.
    - e. Sika Corporation, Construction Products Division; Sikaflex - 1a.
    - f. Tremco Incorporated; Dymonic.
- B. Single-Component, Nonsag, Traffic-Grade, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use T.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. BASF Building Systems; Sonolastic Ultra.
    - b. Sika Corporation, Construction Products Division; Sikaflex - 1a.
    - c. Tremco Incorporated; Vulkem 116.

## 2.3 LATEX JOINT SEALANTS

- A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. BASF Building Systems; Sonolac.
    - b. Bostik, Inc.; Chem-Calk 600.
    - c. Pecora Corporation; AC-20+.
    - d. Tremco Incorporated; Tremflex 834.

## 2.4 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material that are nonstaining; 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. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

## **2.5 MISCELLANEOUS MATERIALS**

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
  - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
    - a. Concrete.
    - b. Masonry.

3. Remove laitance and form-release agents from concrete.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that 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.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  1. Do not leave gaps between ends of sealant backings.
  2. Do not stretch, twist, puncture, or tear sealant backings.
  3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
  1. Place sealants so they directly contact and fully wet joint substrates.
  2. Completely fill recesses in each joint configuration.
  3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
  1. Remove excess sealant from surfaces adjacent to joints.
  2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.
  - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

### **3.4 CLEANING**

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

### **3.5 PROTECTION**

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants 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 sealants immediately so installations with repaired areas are indistinguishable from original work.

### **3.6 JOINT-SEALANT SCHEDULE**

- A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.
  1. Joint Locations:
    - a. Isolation and contraction joints in cast-in-place concrete slabs.
  2. Urethane Joint Sealant: Single component, nonsag, traffic grade, Class 25.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
  1. Joint Locations:
    - a. Construction joints in cast-in-place concrete.
    - b. Control and expansion joints in unit masonry.
    - c. Perimeter joints between materials listed above and frames of doors, windows and louvers.
  2. Urethane Joint Sealant: Single component, nonsag, Class 25.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

- C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
1. Joint Locations:
    - a. Control and expansion joints.
  2. Urethane Joint Sealant: Single component, nonsag, traffic grade, traffic grade, Class 25.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
    - a. Control and expansion joints on exposed interior surfaces of exterior walls.
    - b. Perimeter joints of exterior openings where indicated.
    - c. Vertical joints on exposed surfaces of interior unit masonry walls.
    - d. Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances.
  2. Joint Sealant: Latex.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

**END OF SECTION**

**099113****EXTERIOR PAINTING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes surface preparation and the application of paint systems on the following exterior substrates:
  - 1. Steel.
- B. Related Requirements:
  - 1. Section 099123 "Interior Painting" for surface preparation and the application of paint systems on interior substrates.

**1.3 DEFINITIONS**

- A. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

**1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Initial Selection: For each type of topcoat product.
- C. Product List: For each product indicated, include the following:
  - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
  - 2. Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
  - 3. VOC content.

## **1.5 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
  - 1. Maintain containers in clean condition, free of foreign materials and residue.
  - 2. Remove rags and waste from storage areas daily.

## **1.7 FIELD CONDITIONS**

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Provide the manufacturers listed in Part 3, Paragraph 3.7 "Exterior Paint Schedule for New Substrates". No substitutions.
- B. Products: Subject to compliance with requirements, listed in other Part 3 articles for the paint category indicated.

### **2.2 PAINT, GENERAL**

- A. Material Compatibility:
  - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
  - 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

- B. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.
- C. Colors: As selected by Architect from manufacturer's full range.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- C. Proceed with coating application only after unsatisfactory conditions have been corrected.
  - 1. Application of coating indicates acceptance of surfaces and conditions.

### **3.2 PREPARATION**

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.
- B. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and encapsulants.
- C. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
  - 1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

### **3.3 APPLICATION**

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
  - 1. Use applicators and techniques suited for paint and substrate indicated.
  - 2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.

3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
  4. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

### **3.4 FIELD QUALITY CONTROL**

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
1. Contractor shall touch up and restore painted surfaces damaged by testing.
  2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

### **3.5 CLEANING AND PROTECTION**

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

### **3.6 CONSTRUCTION WASTE MANAGEMENT**

- A. Plan and coordinate the painting work to minimize the generation of waste.
- B. Separate and recycle waste materials in accordance with the Construction Waste Management Plan and place in designated areas.

**3.7 EXTERIOR PAINTING SCHEDULE FOR NEW SUBSTRATES**

- A. Steel Substrates: 2 finish coats over primer, with total DFT not less than 5.0 mils, excluding primer.
  - 1. Prime Coat: Lead-free, alkyd based primer. Prime coat not required on items delivered shop primed.
    - a. Benjamin Moore: Super Spec HP Alkyd Primer.
    - b. Sherwin-Williams: PrepRite Quick Seal Alkyd Primer.
  - 2. Finish Coats: Alkyd High Gloss Enamel.
    - a. Benjamin Moore: Impervo Alkyd Enamel.
    - b. Sherwin-Williams: Pro Industrial Alkyd Enamel.

**099123****INTERIOR PAINTING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes surface preparation and the application of paint systems on the following **existing** interior substrates:
  - 1. Masonry.
  - 2. Steel.
- B. Section includes surface preparation and the application of paint systems on the following **new** interior substrates:
  - 1. Gypsum board.
- C. Related Requirements:
  - 1. Division 5 sections for shop priming of metal substrates with primers specified in this Section.
  - 2. Section 099113 "Exterior Painting" for surface preparation and the application of paint systems on exterior substrates.

**1.3 DEFINITIONS**

- A. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- C. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

**1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product. Include preparation requirements and application instructions.

- B. Samples for Initial Selection: For each type of topcoat product.
- C. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
  - 1. Submit Samples on rigid backing, 8 inches (200 mm) square.
  - 2. Label each coat of each Sample.
- D. Product List: For each product indicated, include the following:
  - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
  - 2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.
  - 3. VOC content.

## **1.5 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
  - 1. Maintain containers in clean condition, free of foreign materials and residue.
  - 2. Remove rags and waste from storage areas daily.

## **1.7 FIELD CONDITIONS**

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Provide the manufacturers listed in Part 3, Paragraph 3.7 "Interior Paint Schedule for Existing Substrates". No substitutions.

- B. Products: Subject to compliance with requirements, listed in other Part 3 articles for the paint category indicated.

## 2.2 PAINT, GENERAL

- A. Material Compatibility:
1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
  2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- B. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
1. Flat Paints and Coatings: 50 g/L.
  2. Nonflat Paints and Coatings: 150 g/L.
  3. Dry-Fog Coatings: 400 g/L.
  4. Primers, Sealers, and Undercoaters: 200 g/L.
  5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
  6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
  7. Pretreatment Wash Primers: 420 g/L.
  8. Floor Coatings: 100 g/L.
  9. Shellacs, Clear: 730 g/L.
  10. Shellacs, Pigmented: 550 g/L.
- C. Colors: As selected by Architect from manufacturer's full range.

## 2.3 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
  2. Testing agency will perform tests for compliance with product requirements.
  3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
  - 1. Concrete: 12 percent.
  - 2. Masonry (CMU): 12 percent.
  - 3. Gypsum Board: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
  - 1. Application of coating indicates acceptance of surfaces and conditions.

### **3.2 PREPARATION**

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and **incompatible paints** and encapsulants.
  - 1. The type of paint used in the existing building is unknown (oil or latex). It is the responsibility of the Contractor to determine if the paint specified is compatible with the existing paint.
  - 2. Apply primer and finish paint coats to a test area. Allow paint to dry for one week for adhesion test.
  - 3. Remove incompatible primers and paints and reprime substrate with compatible primer as required to produce paint systems indicated.

- D. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.
- E. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.
- F. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
  - 1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

### **3.3 APPLICATION**

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
  - 1. Use applicators and techniques suited for paint and substrate indicated.
  - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
  - 3. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
  - 4. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

### **3.4 FIELD QUALITY CONTROL**

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
  - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
  - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

### **3.5 CLEANING AND PROTECTION**

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

### **3.6 CONSTRUCTION WASTE MANAGEMENT**

- A. Plan and coordinate the painting work to minimize the generation of waste.
- B. Separate and recycle waste materials in accordance with the Construction Waste Management Plan and place in designated areas.

### **3.7 INTERIOR PAINTING SCHEDULE FOR EXISTING SUBSTRATES**

- A. Masonry Substrates: 2 coats, with total DFT not less than 2.5 mils.
  - 1. First and Second Finish Coats: Interior Low-VOC Acrylic Semi Gloss Coating.
    - a. Benjamin Moore: Aura Interior Latex.
    - b. Sherwin-Williams: Harmony Interior Latex.
- B. Steel Substrates: 2 coats, with total DFT not less than 2.5 mils.
  - 1. Finish Coats: Alkyd High Gloss Enamel.
    - a. Benjamin Moore: Impervo Alkyd Enamel.
    - b. Sherwin-Williams: Pro Industrial Alkyd Enamel.

### **3.8 INTERIOR PAINTING SCHEDULE FOR NEW SUBSTRATES**

- A. Gypsum Board Ceiling Substrates: 2 coats over primer, with total DFT not less than 2.5 mils, excluding primer.
  - 1. Prime Coat: Low VOC Latex Primer.
    - a. Benjamin Moore: Fresh Start All Purpose Latex Primer.
    - b. Sherwin-Williams: Harmony Latex Primer.

2. First and Second Finish Coats: Interior Low-VOC Latex Flat Coating.
  - a. Benjamin Moore: Aura Interior Latex.
  - b. Sherwin-Williams: Harmony Interior Latex.

**END OF SECTION**

**142400****HYDRAULIC ELEVATORS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes hydraulic passenger elevators.
- B. Related Requirements:
  - 1. Section 033000 "Cast-in-Place Concrete" for setting sleeves, inserts, and anchoring devices in concrete.
  - 2. Section 042000 "Unit Masonry" for setting sleeves, inserts, and anchoring devices in masonry and for grouting elevator entrance frames installed in masonry walls.
  - 3. Section 055000 "Metal Fabrications" for the following:
    - a. Hoist beams.
    - b. Pit ladders.

**1.3 DEFINITIONS**

- A. Definitions in ASME A17.1/CSA B44 apply to work of this Section.

**1.4 ACTION SUBMITTALS**

- A. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information. Include product data for car enclosures, hoistway entrances, and operation, control, and signal systems.
- B. Initial Shop Drawings:
  - 1. Include plans, elevations, sections, and large-scale details indicating service at each landing, machine room layout, coordination with building structure, relationships with other construction, and locations of equipment.
  - 2. Include large-scale layout of car-control station.
  - 3. Indicate maximum dynamic and static loads imposed on building structure at points of support, and maximum and average power demands.

- C. Samples for Initial Selection: For finishes involving color selection.
- D. Post Demolition Shop Drawings:
  - 1. Upon completion of the demolition of the existing elevator shaft and evaluation of the existing jack hole, provide revised shop drawings noting any changes to the support of the cab or modifications to the in ground jack hole, due to the location and condition to the existing jack hole.

### **1.5 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer.
- B. Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway, pit, and machine room layout and dimensions, as shown on Drawings, and electrical service as shown and specified, are adequate for elevator system being provided.
- C. Sample Warranty: For special warranty.

### **1.6 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: For elevators to include in emergency, operation, and maintenance manuals.
- B. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.

### **1.7 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Approved manufacturer with minimum ten years' experience in manufacturing elevators of the type required for this project.
  - 1. The major parts of the elevator equipment shall be manufactured in the United States of America.
  - 2. The manufacturer shall have a documented, on-going quality assurance program.
- B. Installer Qualifications: Elevator manufacturer or an authorized agent of the manufacturer with not less than ten years of satisfactory experience installing elevators equal in character and performance to the project elevators.
- C. Inspection and Testing: Elevator installer shall obtain and pay for all required tests, permits and fees for the elevator installation.

**1.8 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, and handle materials, components and equipment in manufacturer's protective packaging. Store materials, components, and equipment off of ground, under cover, and in a dry location.

**1.9 COORDINATION**

- A. Coordinate installation of sleeves, block outs, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, sleeves, elevator equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.
- B. Furnish well casing and coordinate delivery with related excavation work.
- C. Coordinate locations and dimensions of other work relating to hydraulic elevators including pit ladders; sumps and floor drains in pits; entrance subsills; electrical service; and electrical outlets, lights, and switches in hoistways, pits, and machine rooms.

**1.10 WARRANTY**

- A. Manufacturer's Special Warranty: Manufacturer agrees to repair, restore, or replace elevator work that fails in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.
  - 2. Warranty Period: Two years from date of Substantial Completion.

**1.11 MAINTENANCE**

- A. Furnish maintenance and call back service for a period of 12 months from the date of Substantial Completion, during normal working hours, excluding callbacks. Service shall consist of monthly examination of equipment, adjustment, lubrication, cleaning, supplies and parts to keep the elevator in proper operation.
  - 1. Manufacturer shall have a service office and full time service personnel within a 100 mile radius of the project site.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Controller Manufacturer: Subject to compliance with requirements, provide the following:
  - 1. Motion Control Engineering.
- B. Cab Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following or equal:
  - 1. Columbia.
  - 2. Gunderlin.
  - 3. Tyler.
- C. Fixture Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following or equal:
  - 1. Innovation Industries.
  - 2. PTL.
- D. Hoistway Equipment Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, the following or equal:
  - 1. Hollister Whitney.
- E. Door Operator Equipment Manufacturer: Subject to compliance with requirements, provide the following:
  - 1. GAL.

### **2.2 PERFORMANCE REQUIREMENTS**

- A. Regulatory Requirements: Comply with ASME A17.1/CSA B44.
- B. Accessibility Requirements: Comply with Section 407 in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and with ICC A117.1.
- C. Building Code: Virginia Uniform Statewide Building Code.
- D. NFPA 70-2011 National Electric Code.
- E. NFPA 80 Fire Doors and Windows.

## 2.3 ELEVATORS

- A. Elevator System, General: Manufacturer's standard elevator systems. Unless otherwise indicated, manufacturers' standard components shall be used, as included in standard elevator systems and as required for complete system.
- B. Elevator Description:
1. Elevator Number: E-1.
  2. Type: Under-the-Car Single Cylinder.
  3. Rated Load: 3500 lb (1589 kg).
  4. Rated Speed: 150 fpm (0.76 m/s).
  5. Operation System: Single automatic.
  6. Car Enclosures:
    - a. Inside Width: 80 inches (2032 mm) from side wall to side wall.
    - b. Inside Depth: 65 inches (1651 mm) from back wall to front wall (return panels).
    - c. Inside Height: 95 inches (2413 mm) to underside of ceiling.
    - d. Front Walls (Return Panels): Satin stainless steel, No. 4 finish with integral car door frames.
    - e. Car Fixtures: Satin stainless steel, No. 4 finish.
    - f. Side and Rear Wall Panels: Plastic laminate.
    - g. Reveals: Satin stainless steel, No. 4 finish.
    - h. Doors: Horizontal sliding car doors reinforced with steel for panel rigidity. Hang doors on sheave type hangers with polyurethane times that roll on a polished steel track and are guided at the bottom by non-metallic sliding guides.
    - i. Door Faces (Interior): Satin stainless steel, No. 4 finish.
    - j. Door Sills: Aluminum, mill finish.
    - k. Canopy: Cold-rolled steel with hinged exit.
    - l. Ceiling: Luminous ceiling.
    - m. Handrails: 1-1/2 inches (38 mm) round satin stainless steel, No. 4 finish sides and rear of car.
    - n. Floor: Manufacturer's standard carpet.
  7. Hoistway Entrances:
    - a. Frames: Existing hoistway frames to be reused.
    - b. Doors: Existing hoistway doors to reused.
    - c. Sills: Existing hoistway sills to be reused
  8. Hall Stations: Tamper resistant buttons and fire department key access with recessed type Satin stainless steel, No. 4 finish cover plate.
  9. Additional Requirements:
    - a. Provide inspection certificate in each car, mounted under acrylic cover with frame made from satin stainless steel, No. 4 finish.
    - b. Provide hooks for protective pads and a complete set of full-height protective pads.

## 2.4 POWER UNIT

- A. Power Unit (Oil Pumping and Control Mechanism): A self-contained unit consisting of the following items:
1. Oil reservoir with tank cover.
  2. Oil hydraulic pump.
  3. Electric motor.
  4. Oil control valve.
- B. Hydraulic Pump: Positive-displacement type with a maximum of 10 percent variation between no load and full load and with minimum pulsations.
1. Pump shall be submersible type with submersible squirrel-cage induction motor, and shall be suspended inside oil tank from vibration isolation mounts.
- C. Hydraulic Silencers: System shall have hydraulic silencer containing pulsation-absorbing material in blowout-proof housing at pump unit.
- D. Motor: Standard manufacture motor specifically designed for oil-hydraulic elevator service. Duty rating shall be selected for speed and load.
1. Motor shall have solid-state "Soft" starting.
- E. Oil Control Unit: The following components shall be built into a single housing. Welded manifolds with separate valves to accomplish each function are not acceptable. Adjustments shall be accessible and be made without removing the assembly from the oil line.
1. Relief valve shall be externally adjustable and be capable of bypassing the total oil flow without increasing back pressure more than 10 percent above that required to barely open the valve.
  2. Up start and stop valve shall be adjustable and designed to bypass oil flow during start and stop of motor pump assembly. Valve shall close slowly, gradually diverting oil to or from the jack unit, ensuring smooth up starts and up stops.
  3. Check valve shall be designed to close quietly without permitting any perceptible reverse flow.
  4. Lowering valve and leveling valve shall be adjustable for down start speed, lowering speed, leveling speed and stopping speed to ensure smooth "down" starts and stops. The leveling valve shall be designed to level the car to the floor in the direction the car is traveling after slowdown is initiated.
- F. Piping: Size, type, and weight of piping as recommended by elevator manufacturer, with flexible connectors to minimize sound and vibration transmissions from power unit.
1. Cylinder units shall be connected with dielectric couplings.
  2. Casing for Underground Piping: Schedule 40 PVC pipe complying with ASTM D 1785, joined with PVC fittings complying with ASTM D 2466 and solvent cement complying with ASTM D 2564.

- G. Hydraulic Fluid: Provide proper grade hydraulic oil as specified by the manufacturer of the power unit.

## 2.5 OPERATION SYSTEMS

- A. General: Provide non-proprietary microprocessor operation system as required to provide type of operation indicated and be protected from environmental extremes and excessive vibrations in a NEMA 1 enclosure.
- B. Auxiliary Operations: In addition to primary operation system features, provide the following operational features for elevators where indicated:
  - 1. Single-Car Battery-Powered Lowering: If power fails and car is at a floor, it remains at that floor, opens its doors, and shuts down. If car is between floors, it is lowered to a preselected floor, opens its doors, and shuts down. If car is below the preselected floor, it is lowered to the next lower floor, opens its doors, and shuts down. System includes rechargeable battery and automatic recharging system.
- C. Automatic Light and Fan Shut Down: The operating system shall evaluate the system activity and automatically turn off the cab lighting and ventilation fan during periods of inactivity. The settings shall be field programmable.

## 2.6 HOISTWAY EQUIPMENT

- A. Platform: Fabricated frame of formed or structural steel shapes, gusseted and rigidly welded with a wood subfloor. Underside of the platform shall be fireproofed. The car platform shall be designed and fabricated to support one-piece loads weighing up to 25% of the rated capacity.
- B. Sling: Steel stiles affixed to a steel crosshead and bolstered with bracing members to remove strain from the car enclosure.
- C. Guide Shoes: Roller guides shall be mounted on top and bottom of the car.
- D. Buffers: Provide substantial buffers in the elevator pit. Mount buffers on a steel template that is fastened to the pit floor or continuous channels fastened to the elevator guide rail or securely anchored to the pit. Provide extensions if required by project conditions.
- E. Jack: Jack unit shall be of sufficient size to lift the gross load the height specified. Factory test jack to insure adequate strength and freedom from leakage. Brittle material, such as gray cast iron, is prohibited in the jack construction. Provide the following jack type: Twin post holeless telescopic 2 stage. Two jacks piped together, mounted one on each side of the car with each having two telescopic sections designed to extend in a synchronized manner when oil is pumped into the assembly. Each jack section will be guided from within the casing or the plunger assembly used to house the section. Each plunger shall have a high pressure sealing system which will not allow for seal movement or displacement during the course of operation. Each jack

assembly shall have a check valve built into the assembly to allow for automatically re-synching the two plunger sections by moving the jack to its fully contracted position. The jack shall be designed to be mounted on the pit floor or in a recess in the pit floor. Each jack section shall have a bleeder valve to discharge any air trapped in the section.

- F. Automatic Self-Leveling: Provide each elevator car with a self-leveling feature to automatically bring the car to the landings and correct for over-travel or under-travel. Self-leveling shall, within its zone, be automatic and independent of the operating device. The car shall be maintained approximately level with the landing irrespective of its load.
- G. Inserts: Furnish required concrete and masonry inserts and similar anchorage devices for installing guide rails, machinery, and other components of elevator work. Device installation is specified in another Section.

## **2.7 HOISTWAY ENTRANCES**

- A. Hoistway Entrance Assemblies: The existing doors and frames shall be reused. Remove doors and frames as required to install new elevator equipment. Paint doors and frames as per Section 099123 "Interior Painting".
- B. Interlocks: Replace each hoistway entrance with interlock of same type currently installed, tested as required by code. Provide door restriction devices as required by code.
- C. Door Hanger and Tracks: Replace with same type as existing.
- D. Hoistway Sills: Retain existing, replace gibs on door panels and add fire stops as necessary.

## **2.8 DOOR REOPENING DEVICES**

- A. Infrared Array: Provide door reopening device with uniform array of 150 or more microprocessor-controlled, infrared light beams projecting across car entrance. Interruption of one or more light beams shall cause doors to stop and reopen.
- B. Nudging Feature: After car doors are prevented from closing for predetermined adjustable time, through activating door reopening device, a loud buzzer shall sound and doors shall begin to close at reduced kinetic energy.
- C. Limited Door Reversal: If the doors are closing and the infra-red beam(s) is interrupted, the door will reverse and reopen partially. After the obstruction is cleared, the doors will begin to close.
- D. Door Open Watchdog: If the doors are opening, but do not fully open after a field adjustable time, the doors will recycle closed then attempt to open four times to try and correct the fault.

- E. Door Close Watchdog: If the doors are closing, but do not fully close after a field adjustable time, the doors will recycle open the attempt to close four times to try to correct the fault.

## 2.9 CAR ENCLOSURES

- A. General: Provide steel-framed car enclosures with nonremovable wall panels, with removable car roof, access doors, power door operators, and ventilation.
  - 1. Provide standard railings complying with ASME A17.1/CSA B44 on car tops where required by ASME A17.1/CSA B44.
- B. Materials and Finishes: Manufacturer's standards, but not less than the following:
  - 1. Subfloor: Exterior, underlayment grade plywood, not less than 5/8-inch (15.9-mm) nominal thickness.
  - 2. Floor Finish: Elevator manufacturer's standard level-loop nylon carpet; color as selected by Architect from manufacturer's full range.
  - 3. Plastic-Laminate Side and Rear Wall Panels: Plastic laminate adhesively applied to manufacturer's standard honeycomb core with plastic-laminate panel backing and manufacturer's standard protective edge trim. Panels have a flame-spread index of 25 or less, when tested according to ASTM E 84. Plastic-laminate color, texture, and pattern as selected by Architect from plastic-laminate manufacturer's full range.
  - 4. Fabricate car with recesses and cutouts for signal equipment.
  - 5. Fabricate car door frame integrally with front wall of car.
  - 6. Stainless-Steel Doors: Flush, hollow-metal construction; fabricated from stainless-steel sheet.
  - 7. Sight Guards: Provide sight guards on car doors.
  - 8. Sills: Extruded metal, with grooved surface, 1/4 inch (6.4 mm) thick.
  - 9. Luminous Ceiling: Fluorescent light fixtures and ceiling panels of translucent acrylic or other permanent rigid plastic.
  - 10. Handrails: Manufacturer's standard handrails, of shape, metal, and finish indicated.
  - 11. Ventilation: Manufacturer's standard exhaust fan, mounted on the car top.
- C. Car Top Inspection: Provide a car top inspection station with an "Auto-Inspection" switch, an "Emergency Stop" switch, and constant pressure "up and down" direction and safety buttons to make the normal operating devices inoperative. Provide all code required equipment in one separate fixture/box.

## 2.10 SIGNAL EQUIPMENT

- A. General: Provide hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. All call registered lights shall be LED type.
- B. Car-Control Stations: Provide manufacturer's standard recessed car-control stations. Mount in return panel adjacent to car door unless otherwise indicated. The operating panel shall include pushbuttons that illuminate using LED's and shall be included for

each floor served, and emergency buttons and switches shall be provided per the building code. Switches for the car light and accessories shall be provided.

1. Mark buttons and switches for required use or function. Use both tactile symbols and Braille.
- C. Emergency Communication System: Integral phone system with all code required features to be included in car station.
- D. Hall Push-Button Stations: Provide one hall push-button station at each landing. Vandal resistant buttons with center jewels which illuminate to indicate that a call has been registered at that floor for the indicated direction. Each button shall be provided with an automatic stop to prevent damage of the switches that register the call. Provide fire service key switch, instructions for hall station at the lower level. Provide IN CASE OF FIRE signage as prescribed by Code in both hall stations.
- E. Column Mounted Car Riding Lantern: A car riding lantern shall be installed in the elevator cab. The lantern, when illuminated, will indicate the intended direction of travel. The lantern will illuminate and a signal will sound when the car arrives at a floor where it will stop. The lantern shall remain illuminated until the door(s) begin to close.
- F. Floor Identification Pads: Provide door jamb pads at each floor. Jamb pads shall comply with the Americans with Disabilities Act (ADA) requirements.

## **2.11 FINISH MATERIALS**

- A. General: Provide the following materials for exposed parts of elevator car enclosures, car doors, hoistway entrance doors and frames, and signal equipment as indicated.
- B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, commercial steel, Type B, exposed, matte finish.
- C. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, commercial steel, Type B, pickled.
- D. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304.
- E. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063.
- F. Plastic Laminate: High-pressure type complying with NEMA LD 3, Type HGS for flat applications and Type BKV for panel backing.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine elevator areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work. Verify critical dimensions and examine supporting structure and other conditions under which elevator work is to be installed.

- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION**

- A. Excavation for Cylinder: Existing hole to be reused and modified to accommodate installation of a new cylinder.
- B. Install cylinder in protective casing within well hole. Before installing protective casing, remove water and debris from well hole .
  - 1. Fill void space between protective casing and cylinder with corrosion-protective filler.
  - 2. Align cylinders and fill space around protective casing with fine sand.
- C. Install cylinder plumb and accurately centered for elevator car position and travel. Anchor securely in place, supported at pit floor. Seal between protective casing and pit floor with 4 inches (100 mm) of nonshrink, nonmetallic grout.
- D. Welded Construction: Provide welded connections for installing elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of worn parts. Comply with AWS workmanship and welding operator qualification standards.
- E. Sound Isolation: Mount rotating and vibrating equipment on vibration-isolating mounts to minimize vibration transmission to structure and structure-borne noise due to elevator system.
- F. Lubricate operating parts of systems as recommended by manufacturers.
- G. Leveling Tolerance: 1/4 inch (6 mm), up or down, regardless of load and travel direction.
- H. Reinstall existing hoistway entrances plumb and level.

### **3.3 FIELD QUALITY CONTROL**

- A. Acceptance Testing: On completion of elevator installation and before permitting elevator use (either temporary or permanent), perform acceptance tests as required and recommended by ASME A17.1/CSA B44 and by governing regulations and agencies.
- B. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times that tests are to be performed on elevators.

**3.4 ADJUSTING**

- A. Make necessary adjustments of operating devices and equipment to ensure elevator operates smoothly and accurately.

**3.5 CLEANING**

- A. Before final acceptance, remove protection from finished surfaces and clean and polish surfaces in accordance with manufacturer's recommendations for type of material and finish provided. Stainless steel shall be cleaned with soap and water and dried with a non-abrasive surface. Stainless steel shall not be cleaned with bleached based cleansers.
- B. Clean trash and debris from equipment room and hoistway.

**3.6 PROTECTION**

- A. Provide suitable protective coverings, barriers, or other methods until Substantial Completion. Any damage to the elevator and associated equipment and enclosures is the responsibility of the Contractor until Owner acceptance.

**3.7 DEMONSTRATION**

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate, adjust, and maintain elevator.
- B. Check operation of elevator with Owner's personnel present before date of Substantial Completion and again not more than one month before end of warranty period. Determine that operation systems and devices are functioning properly.

**END OF SECTION**

**313116****TERMITE CONTROL****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Soil treatment with termiticide.

**1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of termite control product.
  - 1. Include the EPA-Registered Label for termiticide products.

**1.4 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For qualified Installer.
- B. Product Certificates: For termite control products, from manufacturer.
- C. Soil Treatment Application Report: After application of termiticide is completed, submit report for Owner's records and include the following:
  - 1. Date and time of application.
  - 2. Moisture content of soil before application.
  - 3. Termiticide brand name and manufacturer.
  - 4. Quantity of undiluted termiticide used.
  - 5. Dilutions, methods, volumes used, and rates of application.
  - 6. Areas of application.
  - 7. Water source for application.
- D. Warranties: Sample of special warranties.

**1.5 QUALITY ASSURANCE**

- A. Installer Qualifications: A specialist who is licensed according to regulations of

- B. authorities having jurisdiction to apply termite control treatment and products in jurisdiction where Project is located, and who employs workers trained and approved by manufacturer to install manufacturer's products.
- C. Regulatory Requirements: Formulate and apply termiticides and termiticide devices according to the EPA-Registered Label.
- D. Source Limitations: Obtain termite control products from single source from single manufacturer.

## 1.6 PROJECT CONDITIONS

- A. Environmental Limitations: To ensure penetration, do not treat soil that is water saturated or frozen. Do not treat soil while precipitation is occurring. Comply with requirements of the EPA-Registered Label and requirements of authorities having jurisdiction.
- B. Coordinate soil treatment application with excavating, filling, grading, and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs before construction.

## 1.7 WARRANTY

- A. Soil Treatment Special Warranty: Manufacturer's standard form, signed by Applicator and Contractor, certifying that termite control work, consisting of applied soil termiticide treatment, will prevent infestation of subterranean termites. If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.

1. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 SOIL TREATMENT

- A. Termiticide: Provide an EPA-Registered termiticide, complying with requirements of authorities having jurisdiction, in an aqueous solution formulated to prevent termite infestation. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to product's EPA-Registered Label.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
  - a. BASF Corporation, Agricultural Products; Termidor.
  - b. Bayer Environmental Science; Premise 75.
  - c. FMC Corporation, Agricultural Products Group; Dagnet FT, Talstar or Prevail.

- d. Syngenta; Demon TC, Prelude or Probuild TC.
2. Service Life of Treatment: Soil treatment termiticide that is effective for not less than five years against infestation of subterranean termites.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of soil per termiticide label requirements, interfaces with earthwork, slab and foundation work, landscaping, utility installation, and other conditions affecting performance of termite control.
- B. Proceed with application only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's written instructions for preparation before beginning application of termite control treatment. Remove all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil within and around foundations.
- B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated. Loosen, rake, and level soil to be treated except previously compacted areas under slabs and footings. Termiticides may be applied before placing compacted fill under slabs if recommended in writing by termiticide manufacturer.
  1. Fit filling hose connected to water source at the site with a backflow preventer, complying with requirements of authorities having jurisdiction.

### **3.3 APPLICATION, GENERAL**

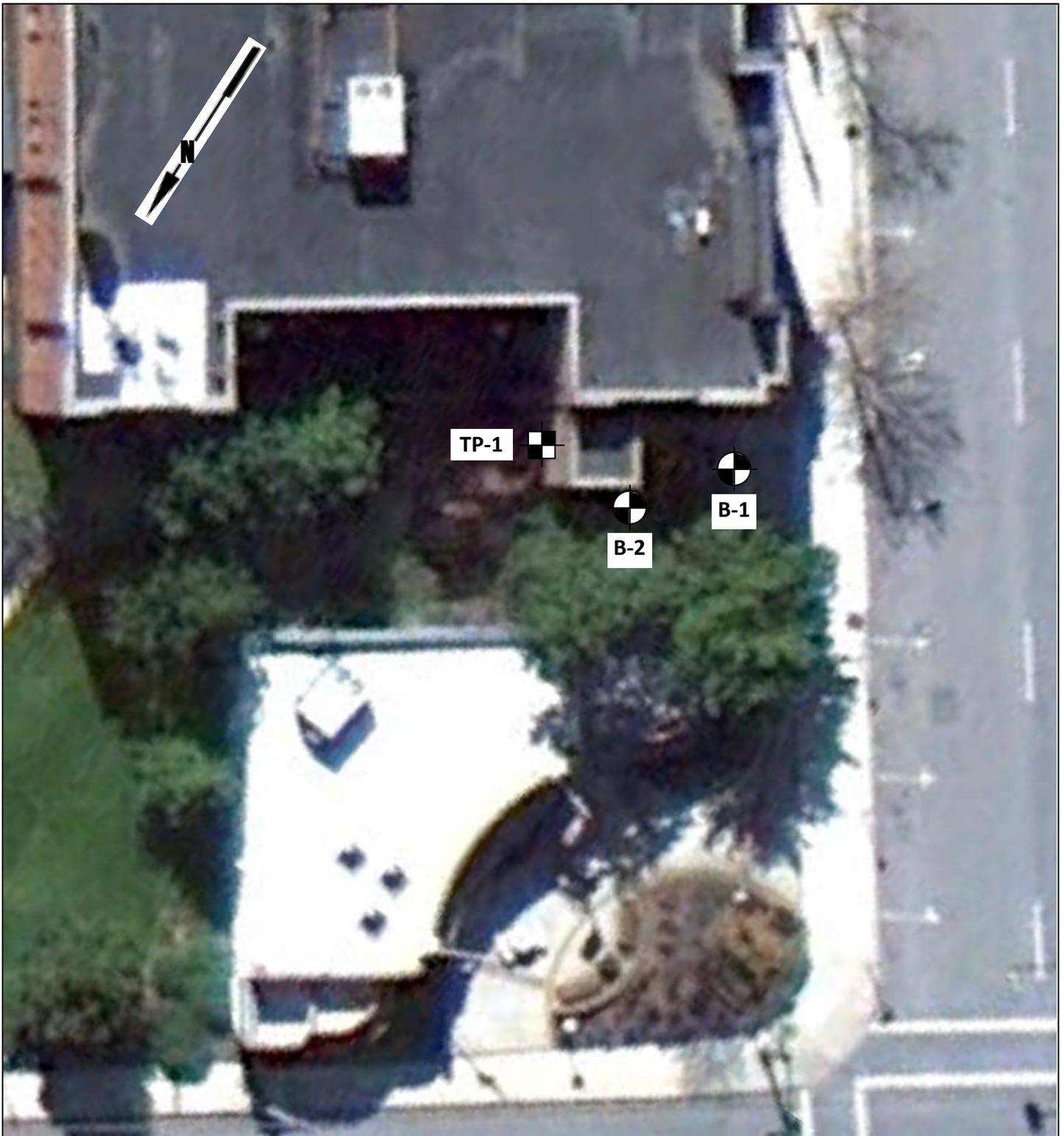
- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's EPA-Registered Label for products.

### **3.4 APPLYING SOIL TREATMENT**

- A. Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute treatment evenly.

1. Slabs-on-Grade: Under ground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
  2. Foundations: Adjacent soil, including soil along the entire inside perimeter of foundation walls; along both sides of interior partition walls; around plumbing pipes and electric conduit penetrating the slab; around interior column footers, piers, and chimney bases; and along the entire outside perimeter, from grade to bottom of footing. Avoid soil washout around footings.
  3. Masonry: Treat voids.
  4. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.
- B. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.
- C. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.
- D. Post warning signs in areas of application.
- E. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

**END OF SECTION**



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**DATE:** January 2013

**SCALE:** Not to Scale

**DRAWN:** BWS 62P0419

Master Engineers & Designers  
 Lynchburg City Armory Elevator Tower  
 Lynchburg, Virginia

BORING  
 LOCATION  
 PLAN

**DRAWING NO.**  
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