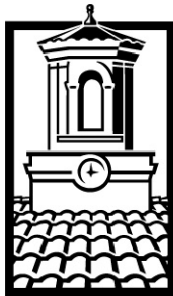


MEMORIAL STUDENT UNION BUILDING ONE STOP SHOP PHASE II

TAMU-K PROJECT NO. 121102



TEXAS A&M
UNIVERSITY
KINGSVILLE



615 N. Upper Broadway
Suite 1250
Corpus Christi, TX 78401-0750
T: 361 884-3295
F: 361 884-3298

www.clkarch.com



January 6, 2012

Set No. _____

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ONE STOP – PHASE II**

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DBR Engineering Consultants, Inc.
January 6, 2012

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REQUEST FOR BID PROPOSAL

Bid Number:

Name of Project: MSUB One Stop Shop – Phase II
PROJECT NO. - 121102

Bids, including a sealed Bid Proposal, for **Project Nos. -** for Texas A&M University-Kingsville shall be received in the office of Procurement & General Services, 955 University Blvd., Room 121 College Hall, Kingsville, Texas **on Thursday, January 26, 2012.** Closing time for the receipt of the sealed bid Proposals and the HUB Subcontracting Plan (HSP) is **2:00 PM.** Bids will be publicly opened and read aloud in room 121 at that time.

The Proposal form, Information to Bidders, Plans (drawings), Conditions of the Contract, Technical specification and other documents that constitute the contract may be examined at the office of **Jack Culbertson, Project Manager, Facilities Planning and Engineering, Texas A&M University – Kingsville, 1010 Retama Dr, Kingsville, Texas 78363, (361-593-2645), OR at CLK Architects & Associates, Inc. 615 N. Upper Broadway, Suite 1250, Corpus Christi, Texas 78401, 361-884-3295 OR they can be downloaded from the Electronic State Business Daily – (Contractor is responsible for frequently checking this website for updates).**

A Pre-Proposal Conference shall be held on Thursday, January **19, 2012 at 2:00pm at 1010 N. Retama Ave., Kingsville, TX 78363**

The Owner reserves the right to waive any formalities or to reject any or all Bids. Alteration or modification of the Bid Forms shall be cause for rejection of the Bid.

Each Bidder must deposit with the Bid, a Bid Security in the amount, form and subject to the conditions provided in the Information to Bidders.

No bidder may withdraw his bid within thirty (30) days after the actual date of the opening thereof.

Date: January, 2012

Name: Jack Culbertson

Project Manager

1010 Retama Dr.

Kingsville, TX., 78363

361.593.4770

UNIVERSITY OFFICIALS

2011

The Texas A&M University-Kingsville

* Administration

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Marilyn M. Fowlé	Vice President for Finance and Administration
Rex F. Gandy	Provost and Vice President for Academic Affairs
D. Scott Gines	Vice President for Institutional Advancement
J. Randy Hughes	Chief of Staff
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Ralph Stephens	Interim Executive Director of Support Services
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* Chancellor

Michael D. McKinney

* **A/E or Consultant**

Architectural - CLK Architects & Associates, Inc.
MEP – DBR Engineering Consultants

The Official Address for Texas A&M University-Kingsville is:
U.S. Mail: 700 University Blvd, MSC 212, Kingsville, TX 78363
Physical: 955 University Blvd, Room 121 College Hall, Kingsville, TX 78363

INSTRUCTIONS TO BIDDERS

1.0 RECEIPT OF BIDS:

- 1.1 Proposals will be received at the time, place and under conditions set for the in the published Request for Bid Proposals (RFBP).
- 1.2 Bidding documents are obtainable from the Architect/Engineer (A/E) under conditions set forth in the RFBP.

2.0 DISCREPANCIES AND INTERPRETATIONS:

- 2.1 Notify the Architect/Engineer (A/E), in writing, at least five (5) business days prior to the scheduled bid opening date, if discrepancies, ambiguities or omissions are found in the bidding documents, or if further information or interpretation is desired.
- 2.2 Answers will be given in writing to all bidders in addenda form. All provisions and requirements of such addenda will supersede or modify affected portions of the bidding documents. All addenda will be incorporated in and bound with the Contract Documents. No other explanation or interpretation will be considered binding.

3.0 SUBMITTAL PROCEDURE:

- 3.1 Submit the Proposal in a sealed unimailer envelope bearing the bidder identification information and the project name for which the Proposal is submitted.
- 3.2 Enclose the Proposal Guaranty in the small envelope affix to the outside of the unimailer envelope, containing the Proposal.
- 3.3 If the Proposal and Guaranty are submitted by mail then place the unimailer envelope in a mailing envelope and address it to the Owner's attention:

*Mr. Ralph Stephens
Director of Procurement and General Services
Room 121; College Hall
Texas A&M University-Kingsville
MSC 212
Kingsville, Texas 78363
361-593-3814
Fax: 361-593-2719*

Delivery of the Proposal and the Guaranty prior to the advertised time set for receipt of the Proposal is the responsibility of the Bidder. See section 4.5 for procedures regarding FAX or telegraphic modifications of Proposal prior to the closing time for their receipt. Such modifications shall be sent to the address shown in 3.3.

3.4. Historically Underutilized Business Plan (HSP) Submittal:

3.4.1. Refer to Article XVIII, Special Conditions, to determine if a HSP is required.

3.4.2. If an HSP is required, then submit one copy of all documents that are required for the HSP in a separate envelope, at the time and place set in the Advertisement for Bids, or in subsequent Addenda. The purpose of the HSP is to demonstrate bidder's compliance with HUB Policy requirements as detailed in Article XVIII, Supplementary Uniform General Conditions. The HSP should be organized in a professional manner.

3.4.3. If the HSP is to be submitted by mail, then place the Plan in a large envelope and address as specified in paragraph 3.2, Instruction to Bidders. Label the outside of the envelope to indicate the following information:

HSP

Bid Number _____

Project Name _____

Bidder's Name _____

Bidder's Address _____

3.4.4. Delivery of the HSP to the place specified, and prior to the advertised set time of receipt of the Proposal, is the responsibility of the Bidder.

3.4.5. A Bidder may modify an HSP by telegraphic or facsimile (FAX) communication provided such communication is received at the place and time set for receipt of the Proposal. However, written confirmation of the modification must be received within two working days following the actual bid opening, or else no consideration will be given to the modification. No modifications will be allowed after the bid opening.

4.0 PROPOSALS:

4.1 The Proposal must be based on conditions at the project site, the bidding documents and addenda issued.

4.2 The Proposal shall be authoritatively executed **in ink** and submitted on the Proposal form furnished by the A/E.

4.3 A Proposal showing omissions, alterations, conditions, or carrying riders or qualifications, which modify the Proposal form will be rejected as irregular.

4.4 Only one Proposal shall be submitted. If two or more Proposals are submitted by a bidder, either in one envelope or in separate envelopes, then such multiple Proposals may be subject to rejection. The blank Proposal form bound in the bidding documents is for the bidder's information only.

4.5 The bidder may modify a Proposal by telegraphic or facsimile (FAX) communication using company letterhead and executed by a company officer provided such communication is received by the presiding official at the location of the bid opening prior to the closing time set for receipt of the Proposals as published in the RFPB. The communication must not reveal the Proposal price but should identify the addition or subtraction or other modification(s) so that the final prices will not be known until the sealed Proposal is opened. If original, written confirmation of the modification is not received within two (2) working days after the date of the bid opening, then the Proposal modifications will be ignored and the total Proposal may be rejected.

- 4.6 If an HSP is required, then the presiding official shall make a preliminary examination of the bidder's HSP, before publicly opening the Proposals, to determine if an apparent good faith effort has been made and for apparent acceptability. If an error or omission is discovered and classified by the presiding official as a technicality that the Owner has reserved the right to waive, the bidder's representative may be permitted to make the appropriate correction. If no HSP is submitted, or if the submitted HSP is not complete and can not be made complete under this procedures, or if the submittal is not indicative of a good faith effort as defined in Article XVIII, Supplementary Uniform General Conditions and Special Conditions, then the presiding official will publicly this to those in attendance at the opening, reject and return the submitted Proposal to the bidder unopened. Within five working days after the HSP receipt, the Owner shall examine the bidder's HSP in detail. If from this detail examination of the HSP, the Owner determines that the Plan is incomplete and/or that a good faith effort has not been made, the proposal shall be declared non-responsive and will be rejected. The bidder will be notified of this action in writing and the submittal proposal shall be returned to the bidder.
- 4.7 Proposal amounts may not be amended or modified in any manner after the time set for receipt of Proposals in the published RFBP. However, after all Bids are publicly opened, but before they are read aloud, they will be examined by the presiding official to determine if they are in proper form and properly signed. If an error or omission is discovered and classified by the presiding official as a technicality, which the Owner had reserved the right to waive, the bidder's representative may be permitted to make the appropriate correction. Any such correction will be announced and explained to the others present at the bid opening. A Proposal that cannot be made eligible for consideration under this procedure will not be read, nor will the Proposal prices be revealed.
- 4.8 Proposals, and HSP's, if required, received after the advertised time for receipt of Proposals will be Ineligible and returned unopened.
- 4.9 The Owner reserves the right to reject any or all Proposals.

5.0 PROPOSAL GUARANTY:

- 5.1 A certified or cashier's check on a State or National Bank in the State of Texas, or a bid bond on The Texas A&M University-Kingsville (TAMUK) Form C-2, Bid/Proposal Bond, from a Surety authorized to transact business in the State of Texas, or as listed in the Department of Treasury's list of companies holding Certificated of Authority as acceptable Sureties on federal bonds and as acceptable reinsuring companies, in the amount of not less than five percent (5%) of the greatest total amount bidder's Proposal, payable without recourse to the order of Texas A&M University-Kingsville, must accompany the Bid Proposal as a guarantee that, if awarded the Contract, the bidder will promptly execute the Agreement, Performance and Payment Bonds (Bonds) on the forms provided.
- 5.2 The Bid/Proposal Bond must be accompanied by an executed Power of Attorney with a live Surety seal on each document. Failure to do so will constitute an irregular bid, which may be rejected. Use of a Surety bid bond form will not be acceptable and will cause the Proposal to be rejected.
- 5.3 Should the successful bidder fail to execute the Contract and Bonds within fifteen (15) working days after the date of transmittal of the Contract Documents for his execution, this Proposal Guaranty becomes the property of the Owner, not as a penalty, but as liquidated damages.
- 5.4 Proposal Guaranties of all bidders shall be retained until after the Contract and Bonds have been executed.

6.0 QUALIFICATIONS OF BIDDER:

- 6.1 The Owner may make such investigations as necessary to determine the ability of the bidder to perform the Work, and the bidder shall furnish any requested information and data including an audited financial statement within 5 days of the Bid Opening. The Owner reserves the right to reject any Proposal if the evidence submitted by, or investigation of, such bidder fails to satisfy the Owner that such bidder is properly qualified to complete the Work.
- 6.2 Each bidder submitting a Proposal must be prepared to furnish the firm's State Comptroller's Vendor Identification Number, or the date on which an application was submitted. Contract payments to the successful bidder are contingent on submittal of this identification number.
- 6.3 Corporate bidders must submit a State Comptroller "Certificate of Good Standing" with the Proposal.
- 6.4 As required by Chapter 231 Texas Family Code, a bid for a contract to be paid from state funds must include the name and social security number of the individual or sole proprietor and each partner, shareholder or owner with an ownership interest of a least 25 percent of the business entity submitting the Proposal.
- 6.5 The Texas Family Code requires each Proposal to include the following statement: "Under Section 231.006, Family Code, the vendor or applicant certifies that the individual or business entity named in this contract bid or application, is not ineligible to receive the specified grant, loan or payment and acknowledges that this contract may be terminated and payment may be withheld if this certification is inaccurate." Bidder agrees with this certification statement upon submittal of a properly executed proposal.
- 6.6 Out of State corporate bidders must submit a Certificate of Good Standing or a Certificate of Authority with the Proposal. These certificates may be applied for through the office of the Texas Secretary of State.

7.0 SITE INVESTIGATION:

- 7.1 It is the responsibility of each bidder to examine the project site, existing improvements and adjacent property and be familiar with existing conditions before submission of a Proposal.
- 7.2 After investigating the project site and comparing the Drawings and Specifications with the existing conditions, the bidder should immediately notify the A/E, in accordance with paragraph 2.0 of this Instructions to Bidders, of any conditions for which requirements are not clear, or about which there is any question regarding the extent of the Work involved.
- 7.3 Should the successful bidder fail to make the required investigation and should a question arise later as to the extent of the Work involved in any particular case, after receiving recommendation from the A/E, the Owner will make the proper interpretation of the Contract Documents.

8.0 CONTRACT AWARD:

- 8.1 The Owner agrees that should the Contract be awarded, it will be awarded to the lowest responsible bidder and the award will be made within thirty (30) days of the bid opening date, unless otherwise stated.
- 8.2 Immediately following action by the awarding authority, the successful bidder will be notified of the award by telegraphic or facsimile message.
- 8.3 The Owner reserves the right to accept or reject any or all alternates or to accept any combination of alternates considered advantageous.

Proposal of: _____

(Legal Firm Name)

PROPOSAL
to
TEXAS A&M UNIVERSITY-KINGSVILLE
FOR THE FOLLOWING WORK

MEMORIAL STUDENT UNION BUILDING – ONE STOP SHOP – PHASE II
CONSTRUCTION DOCUMENTS AND SPECIFICATIONS
DATED JANUARY 6, 2011 - PROJECT NO. 121102

The undersigned, as bidder, declares that the only person or parties interested in this Proposal as principals are those named herein; that this Proposal is made, without collusion with any other person, firm or corporation; that he has carefully examined the form of Contract, Instructions to Bidders, Addenda, Specifications and the Drawings therein referred to and that he has carefully examined the locations, conditions, and the classes of materials of the proposed Work; and agrees that he will provide all the necessary machinery, tools, apparatus and other means of construction and will do all the Work and furnish all the materials called for in the Contract Documents in the manner therein prescribed.

It is further agreed that the quantities of Work to be done and materials to be furnished may be increased or decreased as may be necessary, in the opinion of the Owner’s Representative, to complete the Work as planned and contemplated. Adjustment for changes to Work will be in accordance with Article VI of the General Provisions.

It is understood that the funds for payments of the Work contemplated by the Proposal are to be derived from an appropriation heretofore made or to be made by Texas A&M University-Kingsville and that payments on the Contract will be by bank checks or State of Texas treasury warrants, cashable at face value.

Proposal amounts shall be shown in both words and figures. In case of discrepancy, the amount shown in words shall govern.

The bidder acknowledges receipt and incorporation into this bid of the following addenda:

No: _____

Dated: _____

IF A BIDDER’S BOND IS FURNISHED, and not a Certified or Cashier’s Check, it is understood that the bond will be executed on the Texas A&M University-Kingsville BID BOND FORM, provided with the Proposal form. Failure to do so will constitute an irregular bid which will be rejected. Use of Surety Company’s Bid Bond form will NOT be acceptable. Bidder acknowledgment -- (check) _____.

If BIDDER IS A CORPORATION, the following applies:
Corporate bidder must submit with the Proposal, a Certificate of Good Standing by the Texas State Comptroller.

Bidder Acknowledgment:

Bidder is not a corporation: _____.

Bidder is a corporation and Certificate of Good Standing is attached: _____.

Failure to complete applicable portions of this page may cause the total Proposal to be rejected.

A “nonresident bidder” as defined hereafter may be awarded a Contract in accordance with Act of May 8, 1985, Ch. 83 1, 1985 Tex. Sess. Law Serv. 330 (Vernon) to be codified at Tex. Rev. Civ. Stat. Ann. art. 601g, 1,2 (Vernon) as partially quoted below:

“Section 1.(a)(1)***

(2) “Nonresident bidder” means a bidder whose principal place of business is not in this state, but excludes a contractor whose ultimate parent company or majority owner has its principal place of business in this state.

(3) “Texas resident bidder” means a bidder whose principal place of business is in this state, and includes a contractor whose ultimate parent company or majority owner has its principal place of business in this state.

(b) The state or a governmental agency of the state may not award a contract for general construction, improvements, services or public works projects or purchases of supplies, materials, or equipment to a nonresident bidder unless the nonresident’s bid is lower than the lowest bid submitted by a responsible Texas resident bidder by the same amount that a Texas resident would be required to underbid a nonresident bidder to obtain a comparable contract in the state which the nonresident’s principal place of business is located.

(c) This section does not apply to a contract involving federal funds.”

Each Bidder shall write on this page of this Proposal the bidder’s address of principal place of business and if applicable, the name and address of the bidder’s ultimate parent company or majority owner. Additionally, if the bidder is a “nonresident bidder” as defined above, the bidder shall furnish this OWNER a copy of the relevant current statute of the state which the bidder has its principal place of business for purposes of allowing the OWNER to calculate the bidder’s nonresident bid differential.

Bidder’s name and address of principal place of business:

Ultimate parent company or majority owner’s name and address of principal place of business:

Copies of nonresident State statutes and other material attached:

Yes _____ No _____

The bidding General Contractor shall, in accordance with the laws of the State of Texas, make a good faith effort to award at least 30 percent of the total value of this Contract for the acquisition of supplies, materials, services, and equipment from a HUB (historically underutilized business), and will be required to demonstrate by documentation after award of a contract that such an effort has been made. A HUB is defined as a business formed for the purpose of making a profit in which at least 51 percent of all classes of the shares of stock or other equitable securities are owned or controlled by one or more persons who are socially disadvantaged because of their identification as members of certain groups, including women, black Americans, Hispanic Americans, Asian Pacific Americans or Native Americans. A list of certified HUBs may be obtained from the Small Business Programs of the Texas General Services Commission, (512)463-3612.

The bidder agrees that the percentage of work to be performed on the site by its own organization in compliance with the requirements set forth by Paragraph 5.3.3, Item 5.3.4 of the General Conditions.

The undersigned agrees and pledges himself to complete the Work in the following specified number of calendar days: **90**

BASE PROPOSAL: Bidder agrees to perform all of the labor, supervision, supplies, materials, and other work described in the specifications and shown on the plans, for the sum of:

_____ (\$ _____).

(Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words shall govern.)

ALTERNATES:

Additive Alternate No. 1:

Provide and install carpet tile flooring as specified in Section 09686 and as scheduled below:

Rooms 120, 121, 122, 125, 128, 132, 133, 135, 137, 138, 150, 157: Install carpet over existing VCT. Prepare VCT surface to receive carpet. Existing resilient base, scheduled to remain, is to be replaced with new resilient base. Add painted quarter round trim to existing wood base scheduled to remain.

Rooms 123, 127, 134, 140, 153, 154, 155: Replace existing carpet with new carpet. Prepare surface to receive carpet. Existing resilient base, scheduled to remain, is to be replaced with new resilient base. Add painted quarter round trim to existing wood base scheduled to remain.

Rooms 151, 152, 156: Replace existing carpet with new carpet in lieu of new VCT. Prepare surface to receive carpet.

Add the Sum of: _____ (\$ _____).

Unit Cost of: (\$ _____ per _____).

Additive Alternate No. 2:

Provide and install FM-200 Fire Suppression System as specified in Section 15365 (all components included - turnkey system).

Add the Sum of: _____ (\$ _____).

Unit Cost of: (\$ _____ per _____).

Additive Alternate No. 3:

Demolish portion of existing chase wall at fire hose cabinet. Re-route existing fire cabinet plumbing lines if required.

Add the Sum of: _____ (\$ _____).

Unit Cost of: (\$ _____ per _____).

The Performance and Payment Bonds, as required by the Specifications and the laws of Texas, will be submitted with the executed Contract if this Proposal is accepted.

Accompanying this Proposal is a certified or cashier's check on a State or National Bank of the State of Texas or a Bidder's Bond in the amount of not less than five percent (5%) of the greatest total amount of this Proposal payable without recourse to the order of Texas A&M University-Kingsville. Said check or bond to be returned to the bidder, unless, in case of the acceptance of the Proposal it shall fail to execute a Contract and furnish Performance and Payment Bonds (and provide an acceptable financial statement if required) within fifteen (15) days after the date of transmittal of the Contract Documents. In this case, the check or bond shall become the property of said Owner and shall be considered as payment for damages due to delay and other inconveniences suffered by said Owner because of failure of the bidder to execute the Contract Documents. It is understood that the Owner reserves the right to reject any or all bids, to accept or reject any or all alternates, or to accept a combination of alternates considered advantageous.

The Work proposed to be done shall be accepted when completed as set forth in Article X of the General Conditions.

The bidder agrees that he will not withdraw this proposal for a period of **Sixty (60)** days from the bid opening.

The bidder further agrees to pay as Liquidated Damages the sum of **One-Hundred dollars (\$100.00)** per calendar day for failure to complete the work on time as set forth in Article VIII of the General Provisions.

Bidder: _____
(Legal Firm Name)

By: _____
(Must be authoritatively signed in INK)

Title: _____

Address: _____

Phone No. _____ Fax No. _____

THE TEXAS A&M UNIVERSITY SYSTEM
BID/PROPOSAL BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____
(Name and Address of Bidder/Proposer)

hereinafter called the Principal, and _____

a corporation or firm duly authorized to transact surety business in the State of Texas or as listed in the current notice of the Department of Treasury list of companies holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies, hereinafter called the Surety, are held and firmly bound unto the Board of Regents of The Texas A&M University System, College Station, Texas 77843, hereinafter called the Obligee, in the sum of not less than five percent (5%) of the greatest total amount of the bid or proposal, as a guarantee, the payment of which sum will and truly be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid or proposal for: Project Number _____

(Full name and location of project)

NOW, THEREFORE, if the Obligee shall award the Contract to the Principal and the Principal shall enter into the Contract in writing with the Obligee in accordance with terms of such bid or proposal, and furnish such bonds and other instruments as may be specified in the Contract Documents with good and sufficient Surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, then this bond shall be null and void. If in the event of failure of the Principal to execute such Contract and furnish such bonds and other instruments required by the Contract Documents within fifteen (15) days after the date of transmittal of the Contract Documents to the Principal for execution, this bond shall become the property of the Obligee, without recourse of the Principal and/or the Surety, not as a penalty, but as liquidated damages.

Signed this _____ DAY of _____ A.D., 20_____.

By: _____
(Principal)

(Signature and Title)

* By: _____
(Surety)

(Attorney-in-Fact)

*Attach Power of Attorney for Surety's for Attorney-in-Fact with "live seal".

Surety Seal

DISCLOSURE OF GUARANTY FUND NONPARTICIPATION

In the event the Surety is unable to fulfill its contractual obligation under this bond, the Obligee is not protected by an insurance guaranty fund or other solvency protection arrangement.

PAYMENT BOND

STATE OF TEXAS

COUNTY OF _____ KNOW ALL MEN BY THESE PRESENTS

That we, _____, as Principal

And _____, as surety are hereby held and firmly bound unto the State of Texas in the penal sum of:

_____ and No/100 Dollars \$ _____ for the payment whereof, the said Principal and Surety bind themselves, their heirs, executors, administrators and successors, jointly and severally firmly by these presents.

The conditions of this obligation are such that, whereas the Principal entered into a certain contract, hereto attached and made a part hereof, with the State of Texas or as listed in the current notice of the Department of Treasury list of companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies, acting by and through the Board of Regents of The Texas A&M University System, as Obligee,

Dated _____ 200_, for the _____

Now, if the Principal shall promptly make payments to all claimants, as defined in Chapter 2253, Texas Government Code, supplying labor and materials in the prosecution of the work provided for in said Contract Documents, this obligation shall be null and void, otherwise it shall remain in full force and effect. This Bond is made and entered into solely for the protection of all claimants supplying labor and material in the prosecution of the Work provided for in said Contract Documents, and all such claimants shall have a direct right of action under the Bond as provided in Chapter 2253, Texas Government Code. The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract Documents or to the Work to be performed thereunder shall in any way affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract Documents or to the Work to be performed thereunder.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several

seals this _____ day of _____, 200_, the name and corporate seal of each corporate party being hereto affixed, and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

_____, Principal

(PRINCIPAL'S SEAL
if a corporation)

By _____

Title: _____

_____, Surety

(SURETY'S SEAL)

By _____

Attorney-in-Fact

PERFORMANCE BOND

STATE OF TEXAS

COUNTY OF _____ KNOW ALL MEN BY THESE PRESENTS

That we, _____, as Principal,
and _____
as Surety, are hereby held and firmly bound unto the State of Texas in the penal sum of:

_____ and No/100 Dollars \$ _____
for the payment whereof, the said Principal and Surety bind themselves, their heirs, executors, administrators and successors, jointly and severally firmly by these presents.

The conditions of this obligation are such that, whereas the Principal entered into a certain contract, hereto attached and made a part hereof, with the State of Texas or as listed in the current notice of the Department of Treasury list of companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies, acting by and through the Board of Regents of The Texas A&M University System, as Obligee,

Dated _____ 200_, for the _____

Now, if the Principal shall faithfully perform the Contract in accordance with the Contract Documents, and shall fully indemnify and save harmless the State of Texas from all costs of damage which the State of Texas may suffer by reason of the Principal's default or failure to perform and shall fully reimburse and repay the State of Texas all outlay and expense which the State of Texas may incur in making good any such default, then this obligation shall be null and void, otherwise it shall remain in full force and effect.

In the event Principal is in default under the Contract Documents, Surety will within fifteen (15) days of the determination of such default take over and assume completion of such Contract and become entitled to the payment of the balance of the Contract price, or the Surety shall make other arrangements satisfactory with the Obligee for the completion of the defaulted Work but in no event shall the Surety's liability exceed the penalty of this Bond.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder or to the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the Work or to the Specifications.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several

seals this _____ day of _____, 200_, the name and corporate seal of each party being hereto affixed, and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

_____, Principal

(PRINCIPAL'S SEAL
if a corporation)

By _____

Title _____

_____, Surety

(SURETY'S SEAL)

By _____
Attorney-in-Fact

**UNIFORM GENERAL CONDITIONS
FOR
STATE BUILDING CONSTRUCTION CONTRACTS**

***NOTICE:** This set of Uniform General Conditions is made a part of the Contract pursuant to Government Code § 2166.305. The set contains those contract conditions adopted by the Texas Building and Procurement Commission in the Spring of 2000. The Texas A&M University System has made modifications to the originally approved document that were deemed necessary for clarity and convenience and to expand upon and describe the standard procedures and requirements for the administration of contracts issued by The Texas A&M University System*

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Article I - General Contract Definitions

Unless the context clearly requires another meaning, the following terms shall have the meaning assigned herein:

- 1.1 *Agreed Change Order* means a Change Order jointly executed by the Owner, the Contractor and the A/E, in which each agrees to all of the terms of the Change Order
- 1.2 *Architect/Engineer (A/E)* means a person registered as an architect pursuant to Article 249a, Tex. Civ. Stat. Ann.; as a landscape architect pursuant to Article 249c, Tex. Civ. Stat. Ann.; and/or a person licensed as a professional engineer pursuant to Article 3271a, Tex. Civ. Stat. Ann.; or a firm employed by the Owner to provide professional architectural or engineering services and exercising overall responsibility for the design of a Project or a significant portion thereof, and performing certain contract administration responsibilities as set forth in the Contract.
- 1.3 *Change Order Authorization (COA)* means a Change Order Proposal (COP) which has been marked "Accepted" by the Owner's Designated Representative (ODR) and, upon receipt of the COA by the Contractor, constitutes a notice to proceed with the changed Work described therein. All COAs will be included in the next Change Order.
- 1.4 *Change Order* means a written modification of the Contract between the Owner and the Contractor, signed by the Owner, the Contractor and the A/E.
- 1.5 *Change Order Proposal (COP)* means a Contractor-generated document in response to a Change Order Request (COR) which states the adjustments necessary to the Contract Sum and Time, if any, in response to a change in the Work described in the Change Order Request (COR).
- 1.6 *Change Order Request (COR)* means an Owner-generated document which describes a change in the Work, including a description and Drawings and Specifications, as necessary, to inform the Contractor of the nature of the change.
- 1.7 *Close-out Documents* means the standard product brochures, product/equipment maintenance and operations instructions, manuals, etc., and other materials as may be further defined or identified and required by the Contract Documents.
- 1.8 *Contract* means the agreement between the Owner and the Contractor.
- 1.9 *Contract Date* is the date the Owner-Contractor agreement is effective between the Owner and the Contractor.
- 1.10 *Contract Documents* means the Owner-Contractor agreement, the conditions of the Contract (general, supplementary general and special conditions), the Drawings, the Specifications, the bidding documents, advertisement, invitation to bidders/proposers,

instruction to bidders/proposers, Contractor's proposal, post proposal amendment, all addenda issued prior to and any Request for Information (RFI), Architect's Supplemental Instruction and Change Orders issued after execution of the Contract.

- 1.11 *Contractor* means the individual, corporation, company, partnership, firm or other organization that has contracted with the Owner to perform the Work under the Contract.
- 1.12 *Contract Sum* means the total compensation payable to the Contractor for completion of the Work in accordance with the Contract Documents as originally contracted for and as subsequently adjusted by Change Order.
- 1.13 *Contract Time* means the period between Date of Commencement and the date scheduled for Substantial Completion in the Contract Documents, as may be amended by Change Order.
- 1.14 *Date of Commencement* means the date designated in the Notice-to-Proceed that Contract Time shall begin.
- 1.15 *Day* means a calendar day, unless otherwise specifically stipulated.
- 1.16 *Drawings* mean the work product of the A/E which graphically, depicts the character location and quantity of elements of the Work.
- 1.17 *Final Completion Date* means the date established by the A/E and ODR in a certificate when the Contract is fully performed according to the Contract Documents and is acceptable to the Owner.
- 1.18 *Interim Change Authorization (ICA)* means an Owner generated document which authorizes the Contractor to proceed with changes in the Work before submitting a COP. An ICA is required when Work must proceed in order to prevent damage to Work in place, to prevent significant delay in the Project schedule or to maintain safety.
- 1.19 *Notice-to-Proceed* means the Written Notice provided to the Contractor by the Owner which establishes the Date of Commencement of Contract Time.
- 1.20 *Owner* means the State of Texas acting through any responsible instrumentality of the State of Texas, which is identified in the Contract as the Owner. For purposes of this Contract, the Owner is defined as The Texas A&M University System.
- 1.21 *Owner's Designated Representative (ODR)* means the individual appointed or assigned by the Owner to be its on-site representative during the Project, to exercise certain power on behalf of the Owner and to undertake certain contract administration activities as specifically outlined in the Contract. For purposes of this Contract, the ODR is the Executive Director, Facilities Planning and Construction or other individual appointed by the Executive Director.

- 1.22 *Project* means the Work as described by the Contract Documents.
- 1.23 *Quality Assurance* is the laboratory testing services performed for the benefit of and paid for by the Owner to confirm that performance and quality of the Work is in conformance with the Contract Documents.
- 1.24 *Quality Control* means all actions taken and laboratory design and certification testing performed on the Work and its components for the benefit of and paid for by the Contractor.
- 1.25 *Record Documents* means the operating and maintenance manuals, contract warranties and guaranties, Manual of Materials and Finishes, Listing of all Subcontractors, suppliers and vendors, updated and annotated Specification, updated and annotated “red lined” drawings, all ASIs, RFIs, Shop Drawings and other documents specifically required by the ODR.
- 1.26 *Samples* means the physical examples of materials, equipment or workmanship, that are representative of some portion of the Work and which establish standards by which the Work will be judged.
- 1.27 *Schedule of Values* means the detailed breakdown of the cost of the materials and labor necessary to accomplish the Work as described in the Contract Documents, submitted by the Contractor for approval by the ODR and A/E.
- 1.28 *Shop Drawings* means the drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are prepared by the Contractor or any Subcontractor, manufacturer, supplier or distributor, and which illustrate some portion of the Work.
- 1.29 *Site* means the geographical area at the location where the Work is to be performed.
- 1.30 *Special Conditions* means the documents containing terms and conditions, which relate to a specific project and are peculiar to it. Special Conditions, when used, are a part of the Contract Documents and supercede the Uniform General Conditions and the Supplemental General Conditions to the extent of conflict.
- 1.31 *Specifications* mean the A/E’s work product which establishes the quality of the materials and processes to be used to produce the Work.
- 1.32 *Subcontractor* means a person or organization who, as an independent contractor, contracts directly or indirectly with the Contractor to perform part or all of the Contract between the Owner and the Contractor. The term does not include the A/E.
- 1.33 *Substantial Completion Date* means the date certified by the ODR and A/E when the Work or a designated portion thereof, is so sufficiently complete, in accordance with the Contract Documents, as to be fully operational in all its components and suitable for the use for which it is intended.

- 1.34 *Supplementary General Conditions* means the standard procedures and contract administration requirements of an individual State contracting agency that alter or expand upon matters covered in the Uniform General Conditions. Supplementary General Conditions, when used, are a part of the Contract Documents and supercede the Uniform General Conditions to the extent of conflict.
- 1.35 *Surety* means a corporate body authorized to do business in the State of Texas and bound with the Contractor by means of the Performance and Payment Bonds for the faithful performance of the Work and for the payment of due and unpaid claims.
- 1.36 *Unit Price Work* means Work to be paid for on the basis of unit prices.
- 1.37 *Unilateral Change Order (ULCO)* means a Change Order issued by the Owner without the agreement of the Contractor.
- 1.38 *Work* means all labor, plant, materials, facilities, and all other things, including the construction and services necessary or incidental to fulfill the Contractor's obligations for the Project in conformance with the Contract Documents.
- 1.39 *Work Progress Schedule (WPS)* is an accurate and reliable representation of the progress of the Work and of the Contractor's plans for its completion.
- 1.40 *Written Notice* is considered to have been duly given if a document is delivered in person to the individual or member of the firm or to an officer of the corporation for whom it is intended; if delivered or sent by registered or certified mail to the last business address known to the one who gives the notice; or transmitted by fax machine, with a receipt retained to prove delivery. Notice is deemed effective when given rather than when received.

Article II - General Laws Governing Construction

- 2.1 Compliance with Laws. In the execution of the Contract Documents and the Work, the Contractor shall comply with all applicable State and Federal laws including, but not limited to, laws governing labor, equal employment opportunity, safety, environmental protection and prevailing wage rates. The Contractor shall make itself familiar with and at all times shall observe and comply with all Federal, State and Local laws, ordinances and regulations which in any manner affect the conduct of the Work. The Contractor shall indemnify and hold harmless the State and its official representatives against any claim arising from violation of any such law, ordinance or regulation by the Contractor, and/or its Subcontractors. Except where expressly required otherwise by applicable laws and regulations, neither the Owner nor the A/E shall be responsible for monitoring the Contractor's compliance with any laws or regulations.
- 2.1.1 The Contractor shall cooperate with city or other governmental officials at all times where their jurisdiction applies. The Contractor shall make application, pay all fees and provide supporting documentation necessary

to secure permits, which are required for the performance of the Contract Documents and the Work. The Contractor has a continuing obligation throughout the term of the Contract to conduct its' operations under duly issued permits and, in the event the Contractor loses or has a necessary permit revoked, the Contractor must take immediate steps to apply for and receive another permit.

- 2.2 State Sales and Use Taxes. The Owner qualifies for exemption from State and Local Sales and Use Taxes pursuant to the provisions of Chapter 151, Texas Tax Code (Limited Sales, Excise and Use Tax). The Contractor may claim exemption from payment of applicable State sales taxes by complying with such procedures as may be prescribed by the State Comptroller of Public Accounts.
- 2.3 Antitrust Claims. The Contractor hereby assigns to the Owner any and all claims for overcharges associated with this Contract which arise under the antitrust laws of the United States, 15 U.S.C.A. Sec. 1 et seq.
- 2.4 Venue for Suits. The venue for any suit brought for breach of Contract for this Project shall be in a court of competent jurisdiction in Travis County, Texas.
- 2.5 Licensing of Trades. The Contractor shall comply with all applicable provisions of State law related to required licensing of skilled tradesmen, contractors, material men, suppliers and/or laborers, as necessary to accomplish the Work.
- 2.5.1 In the event the Contractor or one of its Subcontractors loses its license for any reason during the term of performance of the Contract, the Contractor shall promptly hire or contract with a licensed provider of the service at no additional cost to the Owner.
- 2.6 Patents and Copyrights. The Contractor shall be responsible at all times for compliance with applicable patents or copyrights encompassing, in whole or in part, any design, device, material, or process utilized, directly or indirectly, in the performance of the Work.
- 2.6.1 Whether or not the Owner has specified the use of a particular design, device, material or process, the Contractor shall pay all royalties and license fees and shall provide, prior to commencement of the Work hereunder, and at all times during the performance of same, for the lawful use of any design, device, material or process covered by letters, patent or copyright by suitable legal agreement with patentee, copyright holder or their duly authorized representative.
- 2.6.2 The Contractor shall defend all suits or claims for infringement of any patent or copyright and shall save the Owner harmless from loss or liability, direct or indirect, arising with respect to the Contractor's process in the formulation of its bid or performance of the Work or otherwise arising in connection therewith. The Owner reserves the right to provide its own defense to any suit or claim of infringement of any patent or

copyright, in which event the Contractor shall indemnify and hold harmless the Owner from all costs and expenses, including reasonable attorney's fees and judgments, arising from such defense.

- 2.7 Environmental Regulations. At all times, the Contractor shall conduct its activities in compliance with applicable laws and regulations relating to the environment, and its protection. The Contractor covenants to conduct its operations consistent with stormwater run-off permit conditions. The Contractor shall be responsible for any hazardous materials brought to the site by the Contractor, Subcontractor, suppliers or anyone else for whom the Contractor is responsible.
- 2.8 Antiquities. The Contractor shall take precaution to avoid disturbing items of primitive records and antiquities of archaeological, paleontological or historical significance. No objects of this nature shall be disturbed without the written permission of the Owner and the Texas Historical Commission. When such objects are uncovered unexpectedly, the Contractor shall stop all Work in close proximity to such objects and notify the ODR and the Texas Historical Commission of their presence and shall not disturb them until written permission and a permit to do so is granted. All primitive rights and antiquities, as defined in Chapter 191, Texas Natural Resource Code, discovered on the Owner's property shall remain property of State of Texas, Texas Historical Commission. If it is determined by the Owner, in consultation with the Texas Historical Commission, that exploration or excavation of primitive records or antiquities on the Project Site is necessary to avoid loss, the Contractor shall cooperate in salvage work attendant to preservation. If the Work stoppage or salvage work causes an increase in the Contractor's cost of, or time required for, performance of the Work, the Contractor may file with the ODR a Notice of Claim as described in § 21.2.3 (Notice of Claim for Type II Change Orders).

Article III- Compliance with and Enforcement of Prevailing Wage Laws

- 3.1 Duty to Pay Prevailing Wage Rates. The Contractor shall pay not less than the wage scale of the various classes of labor as shown on the Prevailing Wage Schedule provided by the Owner in the Contract Documents. The specified wage rates are minimum rates only. The Owner will not consider any claims for additional compensation made by the Contractor because the Contractor pays wages in excess of the applicable minimum rate contained in the Contract. The "Prevailing Wage Schedule" is not a representation that adequate quantities of qualified labor to perform the Work may be found locally at the specified wage rates.
- 3.2 Prevailing Wage Schedule. The Prevailing Wage Schedule shall be determined by the Owner in compliance with Chapter 2258, Texas Government Code (Prevailing Wage Rates). Should the Contractor at any time become aware that a particular skill or trade not reflected on the Owner's Prevailing Wage Schedule will be or is being employed in the Work, whether by the Contractor or by a Subcontractor, the Contractor shall promptly inform the ODR, and the Owner shall specify a wage rate for that skill or trade, which shall bind the Contractor.

3.3 Penalty for Violation. The Contractor and any Subcontractor shall pay to the State a penalty of sixty dollars (\$60.00) for each worker(s) employed for each calendar Day, or portion thereof, that the worker is paid less than the wage rate stipulated in the Prevailing Wage Schedule or any supplement thereto pursuant to §3.2 (Prevailing Wage Schedule). The Contractor and each Subcontractor shall keep, or cause to be kept, an accurate record showing the names and occupations of all workers employed in connection with the Work, and showing the actual per diem wages paid to each worker. These records shall be available at all reasonable hours for the inspection by the ODR or shall be provided to the ODR upon request.

3.4 Complaints of Violations of Prevailing Wage Rates.

3.4.1. Owner's Determination of Good Cause. Before the 31st day after receipt of information concerning a violation of Chapter 2258, Texas Government Code (Prevailing Wage Rates), the ODR shall make an initial determination as to whether good cause exists to believe a violation occurred. The ODR's decision on the initial determination shall be reduced to writing and sent to the Contractor and/or Subcontractor against whom the violation was alleged, and to the affected worker(s). When a good cause finding is made, the ODR shall retain the full amounts claimed by the claimant(s) as the difference between wages paid and wages due under the Prevailing Wage Schedule and any supplements thereto, together with the applicable penalties, such amounts being subtracted from successive progress payments pending a final decision on the violation.

3.4.2. Arbitration Required if Violation not Resolved. After the ODR makes its initial determination, the affected Contractor and/or Subcontractor and the worker(s) have 14 days in which to resolve the issue of whether a violation occurred, including the amount that should be retained by the Owner or paid to the affected worker(s). If the Contractor and/or Subcontractor and the affected worker reach an agreement concerning the worker's claim, the Contractor shall promptly notify the ODR in a written document signed by the worker. If the Contractor and/or Subcontractor and the affected worker(s) do not agree before the 15th day after the ODR's determination, the Contractor and/or Subcontractor and the affected worker(s) must participate in binding arbitration in accordance with the Texas General Arbitration Act, Chapter 171, Tex. Civ. Prac. & Rev. Code. The parties to the arbitration have 10 days after the expiration of the 14 days referred to above, to agree on an arbitrator. If by the 11th day there is no agreement to an arbitrator, a district court shall appoint an arbitrator on the petition of any of the parties to the arbitration.

3.4.3. Arbitration Award. If an arbitrator determines that a violation has occurred, the arbitrator shall assess and award against the Contractor or Subcontractor the amount of penalty as provided in §3.3 (Penalty for Violation) hereof and the amount owed the worker. The Owner may use any amounts retained under §3.4.1 (Owner's Determination of Good

Cause) hereof to pay the worker the amount as designated in the arbitration award. If the ODR has not retained enough from the Contractor to pay the worker in accordance with the arbitration award, the worker has a right of action against the Contractor and/or Subcontractor as appropriate, and the surety of either to receive the amount owed, attorney's fees and court costs. The Contractor shall promptly furnish a copy of the arbitration award to the ODR.

- 3.5 Prevailing Wage Retainage. Money retained pursuant to §3.4 (Arbitration Award) shall be used to pay the claimant or claimants the difference between the amount the worker(s) received in wages for labor on the Project at the rate paid by the Contractor or Subcontractor and the amount the worker(s) would have received at the prevailing wage rate as provided by the agreement between the claimant and the Contractor and/or Subcontractor affected, or in the arbitrator's award. The full statutory penalty of \$60.00 per day of violation per worker shall be retained by the Owner to offset its administrative costs, pursuant to Texas Government Code §2258.023 (Prevailing Wage Rates). Any retained funds in excess of these amounts shall be paid to the Contractor on the earlier of the next progress payment or final payment. Provided, however, that the Owner shall have no duty to release any funds to either the claimant or the Contractor until it has received the notices of agreement or the arbitration award as provided under §§3.4.2 (Arbitrator Required if Violation not Resolved) and 3.4.3 (Arbitration Award).
- 3.6 No Extension of Time. If the Owner determines that good cause exists to believe a violation has occurred, the Contractor shall not be entitled to an extension of time for any delay arising directly or indirectly from the procedures set forth in §3.4 (Complaints of Violations of Prevailing Wage Rates).

Article IV - Drawings and Specifications

- 4.1 Ownership of Drawings and Specifications. All Drawings, Specifications and copies thereof produced and furnished by the A/E are, and shall remain, its property. They are not to be used on any other project and, with the exception of one set for each party to the Contract, are to be returned to the A/E, upon request, following completion of the Work.
- 4.2 Copies Furnished. The Contractor will be furnished, free of charge, the number of complete sets of the Contract Drawings and Specifications as provided in the Supplementary General Conditions or Special Conditions. Additional complete sets of Drawings and Specifications, if requested, will be furnished at reproduction cost to the party requesting such additional sets.
- 4.3 Interrelation of Documents. The Drawings graphically depict the character, location and quantity of elements of the Work. The specifications indicate quality of materials and the process(es) to be used in the execution of the Work. All documents are intended to be complimentary to produce the Work.

4.4 Resolution of Conflicts in Documents.

- 4.4.1 In the event of conflict between Drawings and Specifications, the Specifications shall prevail. In the event of conflict among provisions of Specifications using the Construction Specifications Institute MasterFormat, what is called for in the division of the predominant discipline will govern over inconsistent provisions found elsewhere.
- 4.4.2. In the event of conflict among the drawings, the large scale and more detailed drawings prevail over the small scale drawings and “not-to-scale” diagrams and schematics.

4.5 Contractor's Duty to Review Contract Documents. In order to facilitate its responsibilities for completion of the Work in accordance with and as reasonably inferable from the Contract Documents, prior to commencing the Work, the Contractor shall examine and compare: the Contract Documents; information furnished by the Owner pursuant to §4.7 (Other Information Provided to Contractor); relevant field measurements made by the Contractor; and any visible conditions at the Site affecting the Work.

4.6 Discrepancies and Omissions in Drawings and Specifications.

- 4.6.1 If in the course of the performance of the obligations in § 4.5 (Contractor’s Duty to Review Contract Documents), the Contractor discovers any errors, omissions or inconsistencies in the Contract Documents, the Contractor shall promptly report them to the Owner. It is recognized, however, that the Contractor is not acting in the capacity of a licensed design professional, and that the Contractor's examination is to facilitate construction and does not create an affirmative responsibility to detect errors, omissions or inconsistencies or to ascertain compliance with applicable laws, building codes or regulations.
- 4.6.2 The Contractor has no liability for errors, omissions, or inconsistencies described in §§ 4.5 (Contractor’s Duty to Review Contract Documents) and 4.6.1 (Discrepancies and Omissions in Drawings and Specifications) unless the Contractor knowingly failed to report a recognized problem to the Owner. If, however, the Contractor fails to perform the examination and reporting obligations of these provisions, the Contractor shall be responsible for any avoidable costs or direct damages.
- 4.6.3 The Owner shall develop a solution and provide it to the Contractor. If the solution prompts changes to the Contract Sum or Contract Time, the contract shall be adjusted under Article XX (Change Orders).

4.7 Other Information Provided to Contractor.

- 4.7.1 The Owner may provide the Contractor with information, reports, pictures or other items which are not contained within the Contract Documents ,

but which the Contractor should review and use pursuant to § 4.5 (Contractor's Duty to Review Contract Documents).

Article V - Construction Bonds

- 5.1 Performance and Payment Bonds. The Contractor is required to tender to the Owner, prior to commencing the Work, Performance and Payment Bonds, as required by Chapter 2253, Texas Government Code (Public Works Performance and Payment Bonds).
- 5.1.1 A Performance Bond is required if the Contract Price is in excess of \$100,000. The Performance Bond is solely for the protection of the Owner, and shall be in the full amount of the Contract and conditioned on the faithful performance of the Work in accordance with the Contract Documents. The form of the bond shall be approved by the Attorney General of Texas.
- 5.1.2 A Payment Bond is required if the Contract Price is in excess of \$25,000. A Payment Bond is payable to the Owner, in the full amount of the Contract and solely for the protection and use of Payment Bond beneficiaries who have a direct contractual relationship with the Contractor or a Subcontractor to furnish required materials, labor or equipment on the Contract. The form of bond shall be approved by the Attorney General of Texas.
- 5.1.3 Corporate Sureties authorized to issue bonds shall be qualified and comply with relevant provisions of the Texas Insurance Code.
- 5.1.4 Each bond shall be executed and contain an embossed seal by a Surety(ies) on forms approved by the Attorney General of Texas. If any Surety upon any bond furnished in connection with the contract becomes insolvent, or otherwise not authorized to do business in the State of Texas, the Contractor shall promptly furnish equivalent security to protect the interests of the State and of persons supplying labor, materials and/or equipment in the performance of the Work.
- 5.2 The process of requiring and accepting bonds and making claims thereunder shall be conducted in compliance with Chapter 2253, Texas Government Code (Public Works Performance and Payment Bonds). If for any reason a statutory Payment or Performance Bond is not honored by the Surety, the Contractor shall fully indemnify and hold the Owner harmless of and from any costs, losses, obligations or liabilities it incurs as a result.
- 5.3 The Owner shall furnish certified copies of a Payment Bond and the related Contract to any qualified person seeking copies who complies with §2253.026, Texas Government Code (Public Works Performance and Payment Bonds).

- 5.4 Claims on Payment Bonds. Claims on Payment Bonds must be sent directly to the Contractor and the Surety in accordance with §2253.041, Texas Government Code (Public Works Performance and Payment Bonds). All Payment Bond claimants are cautioned that no lien exists on the funds unpaid to the Contractor on this Contract, and that reliance on notices sent to the Owner may result in loss of their rights against the Contractor and/or the Surety. The Owner is not responsible in any manner to a claimant for collection of unpaid bills, and accepts no such responsibility because of any representation by any agent or employee.
- 5.5 Payment Claims when Payment Bond not Required. When the value of the Contract between the Owner and the Contractor is \$25,000.00 or less, claimants and their rights are governed by Texas Property Code, §§53.231 – 53.239 (Mechanic’s, Contractor’s or Materialmen’s Leins). These provisions set out the requirements for filing a valid lien on funds unpaid to the Contractor as of the time of filing the claim, and the actions necessary to release the lien and satisfaction of such claims.

Article VI - Insurance Requirements

6.1 Insurance Requirements.

6.1.1 The Contractor shall carry insurance in the types and amounts indicated in this Article for the duration of the Contract, and this coverage shall include items owned by the Owner in the care, custody and control of the Contractor prior to, during construction and during the warranty period. In this circumstance, the Owner will provide in the Special Conditions a listing of such equipment and its value. The Contractor must also complete and file the declaration pages from the insurance policies with the Owner whenever a previously furnished policy period expires during the term of the Contract, as proof of continuing coverage. Acceptance of the insurance policy declaration pages by the Owner shall not relieve or decrease the liability of the Contractor.

6.1.2 Unless otherwise provided for in the Supplementary General Conditions or Special Conditions, the Contractor shall provide and maintain, until the Work covered in this Contract is completed and a report of final acceptance is issued by the Owner, the insurance coverages in the minimum amounts as described below. Coverage shall be written on an occurrence basis by companies authorized and admitted to do business in the State of Texas and rated A- or better by A.M. Best Company, or otherwise acceptable to the Owner.

<u>Type of Coverage</u>	<u>Limits of Liability</u>
a. Worker's Compensation	Statutory
b. Employer's Liability Bodily Injury by Accident	\$500,000 Ea. Accident

Bodily Injury by Disease \$500,000 Ea. Employee
Bodily Injury by Disease \$500,000 Policy Limit

- c. Commercial General Liability, including coverage of Combined Single Limit of Bodily Injury and Property Damage of \$1,000,000 per occurrence or its equivalent for the following:
 - 1) Premises Operations
 - 2) Independent Contractors
 - 3) Products/Completed Operations
 - 4) Personal Injury
 - 5) Contractual Liability
 - 6) Explosion, Collapse, Underground
 - 7) Broad form property damage, to include fire legal liability
- d. Business Automobile Liability owned/leased, owned, hired Combined single limit for Non-Bodily Injury and Property Damage of \$1,000,000 Per Occurrence or its Equivalent
- e. Owner's Protective Liability Insurance Policy, naming the State of Texas, its employees, The Texas A&M University System and its employees and the A/E as insured with the following limits:

Bodily Injury \$1,000,000 Each Occurrence
\$1,000,000 Aggregate

- f. Builder's Risk Insurance
An all risk policy including workmanship acceptable to the Owner, in the amount equal at all times to 100% of the insurable value of materials delivered and labor performed. The policy shall be issued in the name of the Contractor and shall name the Subcontractors as additional insureds. The Owner shall be named as a loss payee on the policy. The builders risk policy shall have endorsements as follow:
 - 1. This insurance shall be specific as to coverage and not considered as contributing insurance with any permanent insurance maintained on the present premises. If off site storage is permitted, coverage shall include transit and storage in an amount sufficient to protect property being transported or stored.
 - 2. For renovation projects and or Work, the Owner waives subrogation for damage by fire to existing building structure(s), if building structure(s) is in care, custody or control of the Contractor.
 - 3. Builder's Risk Policy shall be endorsed to include coverage for existing building structure(s).

- g. Flood insurance is required when specified in the Supplementary General Conditions or the Special Conditions.
- h. Umbrella coverage is required when specified in the Supplementary General Conditions or the Special Conditions.

6.1.3 Policies must include the following clauses, as applicable.

- a. “This insurance shall not be canceled, limited in scope or coverage, or non-renewed until after thirty (30) days prior written notice, or ten (10) days for non-payment of premium, has been given to the Owner.”
- b. “It is agreed that the Contractor’s insurance shall be deemed primary with respect to any insurance or self insurance carried by the State agency for liability arising out of operations under the Contract with the Owner.”
- c. “The Owner, its officials, directors, employees, representatives, and volunteers are added as additional insured as respects operations and activities of, or on behalf of the named insured performed under contract with the Owner.” This is not applicable to the workers’ compensation policy.
- d. “The workers’ compensation and employers’ liability policy will provide a waiver of subrogation in favor of the Owner.”

6.1.4 The workers’ compensation insurance coverage must include the responsibility of the Contractor to provide coverage for every worker either under the Contractor's policy or under the policy provided by a Subcontractor. The Contractor's policy shall provide that, in the event that a Subcontractor's policy fails to provide worker's compensation coverage of a worker, such insurance coverage is provided by the Contractor's policy. The Contractor shall obtain certificates of coverage from Subcontractors carrying their own policies, prior to any Subcontractor providing services to the Project.

6.1.4.1 By signing the Contract or providing or causing to be provided a certificate of coverage, the Contractor is representing to the Owner that all employees of the Contractor who will provide services on the Project will be covered by workers’ compensation coverage for the duration of the Project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier, or in the case of self-insured, with the Texas Workers' Compensation

Commission. Providing false or misleading information may subject the Contractor to administrative penalties, criminal penalties, civil penalties or other civil actions.

- 6.1.5 If insurance policies are not written for the amounts specified in 6.1.2 (Insurance Requirements), the Contractor shall carry Umbrella or Excess Liability Insurance for any differences in amounts specified. If Excess Liability Insurance is provided, it shall follow the form of the primary coverage.
- 6.2 The furnishing of the above listed insurance coverage, as may be modified by the Supplementary General Conditions or Special Conditions, must be tendered prior to performance of the Contract, and in no event later than ten (10) days from the date of the Notice-to-Proceed. Failure to provide the insurance in a timely fashion may result in loss of the Contractor's bid security.
- 6.3 The Owner shall be entitled, upon request and without expense, to receive copies of the policies and all endorsements as they apply to the limits set out in §6.1.2 (Insurance Requirements).

Article VII - General Responsibilities of the Owner and the Contractor

- 7.1 Owner's General Responsibilities.
- 7.1.1 The Owner is the entity identified as such in §1.19 (General Contract Definitions) and is referred to throughout the Contract Documents as if singular in number.
- 7.1.2 Preconstruction Conference. In conjunction with the issuance of the Notice-to-Proceed, a conference will be held and attended by the Owner, the Contractor, the A/E and appropriate Subcontractors, to establish a working understanding among the parties as to the Work, schedules, procedures for handling Shop Drawings and other submittals, processing applications for payment, maintaining required records and all other matters of importance to the Project and effective communications on Site.
- 7.1.3 Owner's Designated Representative. The Owner's Designated Representative (ODR) for The Texas A&M University System projects shall be the Executive Director for Facilities Planning and Construction. Acting on behalf of the Executive Director for Facilities Planning and Construction in day-to-day construction contract administration activities shall be the Director, Facilities Construction Division or designee. Each of these individuals shall have expressed authority to act and bind the Owner to the extent and for the purposes described in the various Articles of the Contract, including responsibilities for general administration of the Contract. Unless otherwise specifically provided for, the ODR is the single point of contact between the Owner and the Contractor. Notice to the

ODR, constitutes notice to the Owner under the Contract.

7.1.4 The Owner shall furnish all surveys describing the physical characteristics, legal description and limitations, site utility locations and other information under the Owner's control which is necessary to the Contractor. Necessary actions of the Owner, including processing of payments to the Contractor, shall be accomplished with reasonable promptness and subject to Article XIII (Contract Payments) hereof. The Owner shall pay for all testing of materials agreed by the Owner and the A/E to be required by the Contract Documents. Retesting of materials failing the initial test shall be paid for by the Contractor.

7.1.5 Owner Supplied Materials and Information. Materials, information, equipment and/or services under the Owner's control shall be furnished by the Owner to the Contractor with reasonable promptness to avoid delay in the orderly progress of the Work.

7.1.6 Availability of Lands. The Owner shall furnish, as indicated in the Contract Documents, all required rights to use the lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for use by the Contractor. The Owner shall identify any encumbrances or restrictions specifically related to the use of lands so furnished and with which the Contractor will have to comply. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by the Owner, unless otherwise provided in the Contract Documents. If the Owner fails to furnish these lands, rights of way or easements in a timely manner and under the conditions set forth in the Contract Documents, the Contractor may make a claim under Article XXI (Administration of Change Order Requests).

7.1.7 The foregoing listing is in addition to the specific duties and authority of the Owner and the ODR found in other Articles of the Contract.

7.2 Limitation on the Owner's Duties. The Owner will not supervise, direct, control or have authority over or be responsible for the Contractor's means, methods, technologies, sequences, procedures of construction or the safety precautions and programs incident thereto. The Owner is not responsible for any failure of the Contractor to comply with laws and regulations applicable to furnishing or performing the Work. The Owner is not responsible for the failure of the Contractor to perform or furnish the Work in accordance with the Contract Documents. The Owner is not responsible for the acts or omissions of the Contractor, or of any Subcontractor, any supplier, or of any other person or organization performing or furnishing any of the Work.

7.3 Role of the Architect/Engineer.

- 7.3.1 In General. Unless otherwise provided for in the Contract Documents, the A/E will perform the duties of the A/E as described in this Contract during construction and until conclusion of the one (1) year warranty period, including advising the ODR on matters where the A/E's assistance is needed. The assignment of any authority, duties or responsibilities to the A/E under these Contract Documents, or under any agreement between the Owner and A/E, or any performance thereof by the A/E is for the exclusive benefit of the Owner and not for the benefit of the Contractor, any Subcontractors, suppliers or their respective employees or Sureties.
- 7.3.2 The A/E has the authority to act on behalf of the Owner to the extent provided for in the Contract Documents, unless otherwise modified by written instrument which will be furnished to the Contractor. The A/E will advise and consult with the Owner, and the Owner's instructions to the Contractor can be issued through the A/E, and the Owner reserves the right to issue instructions directly to the Contractor.
- 7.3.3 All instructions affecting the Contract Sum, Contract Time or Contract interpretation, shall be confirmed by Change Order. No instruction affecting the A/E's design liability shall be issued without the A/E's prior written consent.
- 7.3.4 The A/E shall have the authority to recommend to the Owner the rejection of Work performed by the Contractor which, in the opinion of the A/E, does not meet the requirements of the Contract Documents. The A/E shall communicate with the ODR upon discovery of non-compliant Work and shall provide a recommendation upon request for review by the ODR. The ODR shall order in writing that such non-compliant Work be removed and replaced in accordance with Article XII (Inspection of the Project During Construction).
- 7.3.5 Visits to Site. The A/E will make visits to the Site at intervals appropriate to the various stages of construction as the A/E and Owner deem necessary or as provided in the A/E's contract with the Owner, in order to observe, as an experienced and qualified design professional, the progress that has been made and the quality of the various aspects of the Contractor's executed Work. Based on information obtained during such visits and observations, the A/E will determine, in general, if the Work is proceeding in accordance with the Contract Documents. The A/E will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work, unless otherwise noted. The A/E's efforts will be directed toward providing the Owner a greater degree of confidence that the completed Work will conform to the Contract Documents. On the basis of such visits and on-site observations, the A/E will keep the Owner informed of the progress of the Work and will endeavor to guard the Owner against defective Work. The A/E visits and on-site observations are subject to all the limitations on the A/E's

authority and responsibility set forth in § 7.4 (Limitations on the A/E Authority).

7.3.6 Clarifications and Interpretations. The A/E may determine that written clarifications or interpretations of the requirements of the Contract Documents (in the form of drawings or otherwise) are necessary. Such written clarifications or interpretations will be consistent with the intent of and are reasonably inferable from the Contract Documents, and will be issued with reasonable promptness by the A/E with the concurrence of the Owner and are binding on the Contractor. If the Owner or Contractor believes that a written clarification or interpretation justifies an adjustment in the Contract Sum or the Contract Time, the Owner and/or the Contractor may make a claim therefore as provided in Articles XX (Change Orders) and XXI(Administration of Change Order Requests).

7.3.7 The duties listed above are in addition to other duties, responsibilities and actions to be undertaken by the A/E as specified in other Articles of the Contract Documents.

7.4 Limitations on the Architect/Engineer's Authority. The A/E will not supervise, direct, control or have authority over or be responsible for the Contractor's means, methods, techniques, sequences, procedures of construction, or the safety precautions and programs incident thereto. The A/E is not responsible for any failure of the Contractor to comply with laws and regulations applicable to the performance of the Work. The A/E is not responsible for the Contractor's failure to perform the Work in accordance with the Contract Documents. The A/E is not responsible for the acts or omissions of the Contractor, or of any Subcontractor, any supplier, or of any other person or organization performing any of the Work.

7.5 Contractor's General Responsibilities.

7.5.1 The Contractor is the person or entity identified as such in §1.10 (General Contract Definitions) of the Contract and is referred to throughout the Contract Documents as if singular in number. The Contractor shall supervise and direct the Work using the best skill and attention. The Contractor shall be solely responsible for all construction means, methods, techniques, safety, sequences and procedures, and for coordinating all portions of the Work under the Contract. The Contractor shall be responsible to see that the completed Work complies with the Contract Documents.

7.5.2 Contractor's Superintendent. The Contractor shall employ a competent resident superintendent who shall be in attendance at the Project Site during the progress of the Work. The superintendent shall be satisfactory to the Owner, and shall not be changed except with the written approval of the Owner unless the individual leaves the employment of the Contractor. The replacement superintendent must be approved by the Owner. The superintendent shall represent the Contractor at the Site and shall have full

authority to act on behalf of the Contractor. All communications given to the superintendent shall be binding on the Contractor. All oral communications affecting Contract Time, Contract Sum and contract interpretation will be confirmed in writing by the Owner and included in a Change Order.

- 7.5.3 Labor. The Contractor shall provide competent and qualified personnel to survey, lay out, and construct the Work as required by the Contract Documents. The Contractor shall at all times maintain good discipline and order at the Site.
- 7.5.4 Services, Materials, and Equipment. Unless otherwise specified in the Supplementary General Conditions or Special Conditions, the Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.
- 7.5.5 No Substitutions Without Approval. After issuance of the Notice-to-Proceed, the Contractor may make substitutions only with the consent of the Owner, after the evaluation and recommendation by the A/E.
- 7.5.6 Documents and Samples at the Site. The Contractor shall maintain at the Site, for the Owner, one record copy of the Drawings, Specifications, addenda, Change Orders and other modifications, in good order and currently marked to record field changes and selections made during construction, and one record copy of approved Shop Drawings, Samples and similar required submittals. These documents shall be available to the A/E and shall be delivered to the A/E for submittal to the Owner upon completion of the Work.
- 7.5.7 Non-Compliant Work. Should Work be identified by either the A/E and/or the ODR as not being in compliance with the Contract Documents, the ODR shall communicate the finding to the Contractor and such Work shall be corrected by the Contractor at its expense. The approval of Work by the ODR does not relieve the Contractor from compliance with all requirements of the Contract Documents where such requirements are not judged at the time of observation of the Work due to work sequences by the Contractor or the lack of time to judge the performance characteristics of the particular Work item.
- 7.5.8 Subcontractors. The Contractor shall not employ any Subcontractor, supplier or other person or organization, whether initially or as a substitute, against whom the Owner may have a reasonable objection. The Owner will communicate such objection(s) in writing. If a rejection causes a change to the Contract Sum, the Contractor may file a

Contractor-initiated Type I claim under Article XX. The Contractor shall not be required to employ any Subcontractor, supplier or other person or organization to furnish any of the work to whom the Contractor has reasonable objection. The Contractor will not substitute Subcontractors without the approval of the Owner. Any such substitutions will be made in compliance with the Article XVIII (Historically Underutilized Businesses) and recorded in a Change Order.

7.5.8.1 The Contractor shall enter into written agreements with all Subcontractors and suppliers which specifically binds the Subcontractors and suppliers to the applicable terms and conditions of the Contract Documents for the benefit of the Owner and the A/E. The Owner reserves the right to specify that certain requirements shall be adhered to by all Subcontractors and sub-subcontractors as indicated in other portions of the Contract Documents and these requirements shall be made a part of the agreement between the Contractor and Subcontractor(s) or supplier(s).

7.5.8.2 The Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with the Contractor. The Contractor shall require all Subcontractors, suppliers and such other persons and organizations performing or furnishing any of the Work to communicate with the Owner through the Contractor.

7.5.9 Continuing the Work. The Contractor shall continue the Work and adhere to the Work Progress Schedule during all disputes, disagreements or alternative resolution processes with the Owner. No Work shall be delayed or postponed pending resolution of any disputes, disagreements or processes, except as the Owner and Contractor may agree in writing.

7.5.10 Cleaning. The Contractor shall at all times keep the Site and the Work clean and free from accumulation of waste materials or rubbish caused by the construction activities under the Contract. Upon completion of the Project, and prior to the final inspection, the Contractor shall have the Work in a neat and clean condition.

7.5.11 Acts and Omissions of the Contractor, its Subcontractors and their employees. The Contractor shall be responsible for the acts and omissions of its employees and its Subcontractors, their agents and employees.

7.5.12 Indemnification of the Owner. The Contractor covenants and agrees to FULLY INDEMNIFY and HOLD HARMLESS, the Owner and the elected officials, employees, officers, directors, volunteers, and representatives of the Owner, individually or collectively, from and

against any and all costs, claims, liens, damages, losses, expenses, fees, fines, penalties, proceedings, actions, demands, causes of action, liability and suits of any kind and nature, including but not limited to, personal or bodily injury, death and property damage, made upon the Owner directly or indirectly and arising out of, resulting from or related to the Contractor's activities under this Contract, including any acts or omissions of the Contractor, any agent, officer, director, representative, employee, consultant or Subcontractor of the Contractor, and their respective officers, agents, employees, directors and representatives while in the exercise of performance of the rights or duties under this Contract. The indemnity provided for in this paragraph shall not apply to any liability resulting from the negligence of the Owner, its officers or employees, separate contractors or assigned contractors, in instances where such negligence causes personal injury, death, or property damage. In the event the Contractor and the Owner are found jointly liable by a court of competent jurisdiction, the liability shall be apportioned comparatively in accordance with the laws of The State of Texas without, however, waiving any governmental immunity available to the State under Texas Law and without waiving any defenses of the parties under Texas Law.

7.5.12.1 The provisions of this Indemnification are solely for the benefit of the parties hereto and not intended to create or grant any rights, contractual or otherwise, to any other person or entity.

7.5.12.2 The Contractor shall promptly advise the Owner in writing of any claim or demand against the Owner or other contractor related to or arising out of the Contractor's activities under this Contract.

7.5.13 The duties listed above are in addition to the duties, responsibilities and activities to be undertaken by the Contractor as specified throughout the Articles of this Contract.

Article VIII - Additional Contractor Responsibilities when the Owner Awards Separate Contracts

8.1 Separate Contracts. The Owner reserves the right to award other contracts in connection with other portions of the Project under these or similar contract conditions. The Owner also reserves the right to perform operations related to the Project with the Owner's own forces.

8.1.1 When separate contracts are awarded for different portions of the Project, the "contractor" in the contract documents in each case shall be the contractor who signs each separate contract. This Contractor shall cooperate with the separate contractors and the Owner's own forces. This Contractor shall properly connect and coordinate its Work with the work

of the separate contractors as defined in these Contract Documents.

If any part of this Contractor's Work depends, for proper execution or proper results, on the work of any of the separate contractors, this Contractor shall inspect and promptly report in writing to the ODR any visually apparent discrepancies or defects found in such other work that render it unsuitable for such proper execution and results. Failure of this Contractor to inspect and report the visually apparent discrepancies or defects shall constitute an acceptance of the separate contractor's work as fit and proper to receive this Contractor's Work, except as to defects which may develop in the separate contractor's work after the execution of this Contractor's Work.

8.1.2 Should this Contractor cause damage to the work or property of any separate contractor on the Project, this Contractor shall, upon due written notice, endeavor to settle with the separate contractor by agreement. If such separate contractor does not settle with this Contractor, the Owner shall initiate a dispute resolution process and each party to the dispute shall be financially accountable for any damages or loss based on their proportionate fault determined by the Dispute Resolution process.

8.1.3 This Contractor shall afford the Owner, the A/E, the separate contractors and the Owner's own forces, as necessary, the reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work.

8.2 The Owner shall provide for coordination of the activities of the Owner's own forces and each separate contractor with the Work of this Contractor, who shall cooperate with them. This Contractor shall participate with other separate contractors and the Owner in reviewing the respective construction schedules, when directed to do so. This Contractor shall make any revisions to its construction schedule as necessary, after receiving the Owner's instructions.

8.3 The Owner shall be reimbursed by the Contractor for costs incurred by the Owner which are payable to a separate contractor because of delays, improperly timed activities damage to the Work or defective construction by the Contractor. The Owner shall be responsible to the Contractor for costs incurred by the Contractor because of delays, improperly timed activities, damage to the Work or defective construction by a separate contractor. The Contractor may make claim for such amounts as outlined in Articles XX (Chance Orders), and XXI(Administration of Change Order Request).

Article IX - The Contractor's Responsibility for Jobsite Safety

9.1 Unless otherwise specified in the Supplementary General Conditions or the Special Conditions, the Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. It shall

be the duty and responsibility of the Contractor and all Subcontractors to be familiar and comply with all requirements of Public Law 91-596, 29 U.S.C. §§ 651 et. seq., the Occupational Safety and Health Act of 1970, (OSHA) and all amendments thereto, and to enforce and comply with all of the provisions of that law. The Contractor shall comply with all applicable laws and regulations of any public body having jurisdiction for safety of persons or property to protect them from damage, injury or loss and shall install and maintain all necessary safeguards for such safety and protection.

9.1.1 The Contractor shall notify the owners of adjacent property, underground facilities and utilities when prosecution of the Work may affect them or their facilities, and shall cooperate with them in the protection, removal, relocation and replacement of their facilities and/or utilities.

9.2 In any emergency affecting the safety of persons or property, the Contractor shall act reasonably to prevent damage, injury or loss. The Contractor shall give the ODR and the A/E prompt notice if the Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused by its emergency response. Any additional compensation or extension of time claimed by the Contractor resulting from the emergency work shall be considered in accordance with Articles XX (Chance Orders), and XXI(Administration of Change Order Request).

9.2.1 Authorized agents of the Contractor shall respond immediately to call-out at any time of day or night when circumstances warrant the presence of the Contractor to protect the Work or adjacent property from damage, restriction or limitation or to take such action pertaining to the Work as may be necessary to provide for the safety of the public. Should the Contractor fail to respond, the Owner is authorized to direct other forces to take action as necessary and the Owner may deduct any cost of remedial action from the funds due the Contractor under the Contract by issuance of a deductive Change Order.

9.3 In the event of an accident involving a lost time injury to an individual on or near the Work, the Contractor shall notify the ODR within 24 hours of the event. The Contractor shall record the location of the event and the circumstances surrounding the event, by using photography or other means, and shall gather witness statements and other documentation which describe the event. The Contractor shall supply the ODR and the A/E with a set of such documents no later than 36 hours after the occurrence of the event.

9.4 Environmental Safety and Control. Upon encountering any previously unknown potentially hazardous materials, the Contractor shall immediately stop Work in and secure the affected area, and notify the ODR. All Subcontracts shall expressly bind Subcontractors to the same duty. Upon receiving such notice, the ODR shall promptly engage qualified experts to make such investigations and conduct such tests as may be reasonably necessary to determine the existence or the extent of any environmental hazard. As soon as possible after completion of this investigation, the ODR shall issue a written report to the Contractor identifying the material(s) found and

indicating any necessary steps to be taken to treat, handle, transport or dispose of the material(s). The Owner may hire third-party contractors to perform any or all such steps. Should compliance with the ODR's instructions result in an increase in the Contractor's cost of performance, or delay execution of the Work, an adjustment in the contract price and/or time may be claimed by the Contractor pursuant to the provisions of Articles XX (Change Orders), XXI (Change Order Request), XXII (Change Order Work) and XXIII (Construction Schedule). The Contractor shall fully indemnify, save and hold harmless the Owner from any costs, losses, damages or liabilities resulting from its failure, or the failure of its Subcontractors, to strictly comply with these provisions.

9.4.1 The Contractor shall be responsible for coordinating the exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the site in connection with laws and regulations.

Article X - Materials and Workmanship; Licensing and Testing

10.1 Materials and Workmanship. The Contractor warrants and guarantees that all Work shall be executed in a good and workmanlike manner in accordance with the Contract Documents, complete in all parts and in accordance with generally accepted industry standards and practices. Unless otherwise specified, all materials and equipment incorporated into the Work under the Contract shall be new.

10.2 Contractor's Warranty of Workmanship.

10.2.1 Limits on Warranty. The Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

- a. Abuse, modification or improper maintenance or operation by persons other than the Contractor, Subcontractors, suppliers or any other individual or entity for whom the Contractor is responsible, or
- b. Normal wear and tear under normal usage.

10.2.2 Events Not Affecting Warranty. The Contractor's obligation to perform and complete the Work in a good and workmanlike manner in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of the Contractor's obligation to perform the Work in accordance with the Contract Documents:

- a. Observation by the Owner and/or the A/E;
- b. Recommendation to pay any progress or final payment by the A/E;

- c. The issuance of a Certificate of Substantial Completion or any payment by the Owner to the Contractor under the Contract Documents;
- d. Use or occupancy of the Work or any part thereof by the Owner;
- e. Any acceptance by the Owner or any failure to do so;
- f. Any review of a Shop Drawing or sample submittal; or
- g. Any inspection, test or approval by others.

10.3 Routine Testing. If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any Work to be inspected, tested or approved, the Contractor shall give the ODR and the A/E timely notice of its readiness and the date arranged so the ODR and/or the A/E may observe such inspection, testing or approval. Should the material or Work fail to comply with the requirements of the Contract Documents, the Contractor shall bear all costs of re-testing, re-inspection or approval as well as the cost of replacement of unsatisfactory material or Work as provided by Article XII (Inspection of the Project during Construction).

10.3.1 The costs of routine testing shall be borne by the Owner, but the Contractor shall be responsible for the cost of material tested. When directed by the ODR, demonstration of a material's compliance with the Specifications shall be made by one of the following:

- a. Manufacturer's certificate of compliance;
- b. Mill certificate;
- c. Testing laboratory certification; and
- d. Report of actual laboratory test from the Owner's laboratory or from a laboratory satisfactory to the Owner. Samples tested shall be selected by or in the presence of the Owner and the method of testing shall comply with the appropriate professional societies' standard specifications.

10.3.2 Materials incorporated into the Work will be subject to routine tests as required to insure their compliance with the Specifications. Materials to be tested include, but are not limited to, the following:

- a. Concrete - Primary mix design, slump tests and cylinder compression tests.
- b. Steel - Tensile tests, field inspection and X-ray of welds.
- c. Soils - Physical analysis and compaction tests.
- d. Pavement - Physical analysis and compaction tests.
- e. Roofing - Samples cut from in-place roof.

Any other materials, for which standard laboratory test procedures have been established, may also be included if doubt as to their quality should

arise. Any testing, as described above, will be done at the discretion of the Owner who will bear all costs. The Contractor shall be held responsible for providing samples of sufficient size for test purposes and for cooperating with the Owner or its representative in obtaining and preparing samples for tests. All tests will be in accordance with standard test procedures and will be performed by a laboratory selected by the Owner. Results of all tests will be provided to the Owner, the A/E and the Contractor.

10.3.2.1 Not included in tests provided by the Owner are:

- a. Any test of material or fabricated equipment offered as a substitute for a specified item on which a test may be required in order to prove its compliance with the Specifications, which testing shall be paid for by the Contractor.
- b. Tests on mechanical systems required to insure their proper installation and operation, which, if undertaken, shall be paid for by the Contractor.

10.3.3 Should any of the routine tests indicate that a material does not comply with the Contract Documents, the burden of proof of compliance shall be with the Contractor, subject to the following conditions:

- a. The Contractor may select the laboratory for further testing, but selection must be approved by the Owner.
- b. The quality and nature of tests will be determined by the Owner.
- c. All tests shall be taken in the presence of the ODR.
- d. If tests prove that the material complies with Specifications, the testing fees will be paid by the Owner. If noncompliance is proved, the testing fees will be paid by the Contractor.
- e. Proof of noncompliance will make the Contractor liable for any corrective action which the Owner feels is prudent, including complete removal and replacement of the defective material.

10.3.3.1. All subsequent tests on original or replaced materials conducted as a result of prior failure shall be paid by the Contractor.

10.3.4 Special Testing. The Owner or the A/E may require special inspection, testing or approval of material or Work for compliance with requirements of the Contract Documents. Upon direction by the ODR, the Contractor shall promptly arrange for such special testing, inspection or approval procedure. The costs of special testing shall be at the Owner's expense, except if the materials fail, the Contractor shall reimburse the Owner for the expense.

- 10.4 If any Work that is to be inspected, tested or approved is covered by the Contractor without written concurrence of the ODR, or if any Work is covered contrary to the written direction of the ODR or A/E, the covered Work must, if requested by the Owner, be uncovered and re-covered at the Contractor's expense, except as set forth in § 12.2.3 (Inspection of the Project during Construction).
- 10.5 Contractor's Testing. Nothing contained herein is intended to imply that the Contractor does not have the right to have tests performed on any material at any time for his own information and job control so long as the Owner is not charged for costs or forced to rely upon such tests when appraising the quality of materials. Any modification of, or elaboration on, test procedures which may be included for specific materials under the respective sections of the Specifications shall take precedence over the procedures performed for the Contractor.

Article XI - Shop Drawings and Submittals

- 11.1 Contractor's Submittals. The Contractor shall submit, with reasonable promptness consistent with the WPS and in orderly sequence, all Shop Drawings, Samples or other information required by the Contract Documents, or subsequently required by the A/E as governed by Change Orders. The Contractor shall review each submittal for compliance with Contract Documents and shall certify that it has done so by stamp, or otherwise, affixed to each copy thereof. Submittal data presented without the Contractor's certification will be returned without review or comment, and any delay resulting therefrom will be the Contractor's responsibility.
- 11.1.1 Shop Drawings, Samples or other required information shall be properly identified, as specified or as the ODR and/or the A/E may require. At the time of submission, the Contractor shall inform the ODR and the A/E in writing of any deviation in the Shop Drawings or Samples from the requirements of the Contract Documents.
- 11.1.2 By submitting Shop Drawings, Samples or other required information, the Contractor thereby represents that it has determined and verified all field measurements, field construction criteria, materials, catalog numbers and similar data, or will do so, and that it has checked and coordinated each Shop Drawing and Sample with the requirements of the Contract Documents and shall so certify as required by § 11.1.
- 11.2 Nature and Effect of Review. The A/E will review and approve all submittals with reasonable promptness in accordance with Supplemental General Conditions, Special Conditions and Division 1, but only for conformance with the design concept of the Project and with the information in the Contract Documents. Such approval will be indicated in writing. The approval of a separate item shall not indicate approval of an assembly in which the item functions. The approval of the Shop Drawings or Samples shall not relieve the Contractor of the responsibility for any deviation from the requirements of the Contract Documents unless the Contractor has informed the Owner and the A/E in writing of such deviation at the time of submission and the ODR or the A/E has not objected to the specified deviation. The approval shall not

relieve the Contractor from the responsibility for errors or omissions in the Shop Drawings or Samples.

- 11.3 Correction and Resubmission. The Contractor shall make any corrections required to a submittal and shall resubmit, until approved, the required number of corrected copies of the submittals promptly so as to avoid delay. The Contractor shall direct attention in writing to the A/E and the ODR, to any new revisions other than the corrections required on previous submissions.
- 11.4 Limits on Shop Drawing Approvals. No Work requiring a Shop Drawing or Sample submission shall be commenced until the submission has been approved. All such Work shall be in accordance with approved Shop Drawings and Samples. Approvals of Shop Drawings and Samples is not authorization to the Contractor to perform extra work or changed work unless the procedures of Articles XX (Change Orders) and XXI (Administration of Change Order Requests) are followed. The A/E's approval does not relieve the Contractor from responsibility for defects in the Work resulting from errors or omissions of any kind on the approved Shop Drawing or Sample.
- 11.5 The Owner may establish routine review procedures and schedules for submittals at the preconstruction conference.
- 11.6 Intent of Contract Documents. It is the intent of the Contract Documents to not limit materials, equipment or fixtures to products of any particular manufacturer. Where definite materials, equipment and/or fixtures have been specified by name, manufacturer or catalog number, it has been done to set a definite standard and a reference for comparison as to quality, application, physical conformity, and other characteristics. It is the Owner's or A/E's intention to not discriminate against or prevent any dealer, jobber or manufacturer from furnishing materials, equipment, and/or fixtures which meet or exceed the characteristics of the specified items. Substitution of materials shall not be made without the prior written approval from the A/E.
- 11.7 Unauthorized Substitutions at Contractor's Risk. All proposed substitutions of materials, equipment or fixtures shall be presented through the submittal process. The Contractor shall be responsible for any additional costs or delays resulting from using materials, equipment or fixtures other than those specified, and shall reimburse the Owner for any increased design or contract administration costs resulting from such unauthorized substitutions.

Article XII - Inspection of the Project During Construction

- 12.1 Contractor Quality Control. The Contractor is responsible for controlling the quality of the Work as set forth in the Contract Documents.
- 12.2 Owner Quality Assurance.
- 12.2.1 The ODR will make periodic visits to the site to familiarize itself with the

progress and quality of the Work, conduct inspections and tests and to determine if the Work is proceeding in accordance with the Contract Documents. The Contractor shall provide sufficient, safe and proper facilities at all reasonable times for observation and/or inspection of the Work by the ODR.

12.2.2 The Contractor shall not cover up any Work with finishing materials or other building components prior to an inspection of the Work by the ODR. Should corrections of the Work be required for approval, cover-up shall be delayed until another inspection can be made and approval is granted.

12.2.3 The Contractor shall be responsible for providing notification of at least fourteen (14) working days, to the ODR of the anticipated need for a cover-up inspection. Should the ODR fail to make the necessary inspection within the fourteen (14) working days, the Contractor may proceed to cover up the Work.

12.3. Condemnation and Removal of Defective Work.

12.3.1 The ODR has the authority to reject and condemn Work which does not meet the requirements of the Contract and to order such Work removed and replaced in accordance with §12.3.2. The approval of a Work item by the ODR does not relieve the Contractor from compliance with the requirements of the Contract Documents.

12.3.2 If any materials or Work furnished under this Contract are condemned by the ODR, the Contractor shall, after notice from the ODR, proceed to remove the materials, whether worked or unworked, and to take down all portions of the condemned Work. The Contractor shall make good all Work damaged or destroyed by the removal and replacement process without additional cost to the Owner.

12.3.3 Upon notice of condemnation, the Contractor may request to prove to the ODR, at the Contractor's sole cost, that the Work should be accepted because it meets performance, and other relevant standards. The ODR shall respond in writing to the Contractor's effort to show proof.

Article XIII - Contract Payments

13.1 Prior to the first pay request the Contractor shall provide a one-time breakdown of the original Contract Sum into the required asset categories. Each line item on the breakdown shall be coded with one of the category codes which are outlined section 01290.

13.2 Schedule of Values. After issuance of the Notice to Proceed, the Contractor shall submit to the ODR and the A/E, a Schedule of Values (SOV) for approval, accurately

itemizing material and labor for the various classifications of the Work. The approved Schedule of Values will be used as the basis for the progress payments under the Contract. No payments will be made to the Contractor until the ODR and A/E have approved the SOV.

13.3 Progress Payments. Periodic progress payments will be made to the Contractor for Work performed, and materials suitably stored and protected on site or as otherwise agreed to by the ODR and the Contractor. Payment shall not become due in accordance with Chapter 2251, Government Code until receipt by the ODR, of a correct and complete periodic invoice, certified by the A/E.

13.3.1 Preliminary Pay Worksheet. Each month, or other period agreed to by the Contractor and the ODR, the Contractor shall submit a preliminary pay worksheet to the A/E and the ODR for review. The worksheet shall consist of the following items:

- a. The approved Schedule of Values with the amount complete shown for each Work category listing and compiled to indicate the total amount due to date;
- b. An updated Work Progress Schedule;
- c. The monthly HUB Subcontracting Plan progress report and;
- d. Any additional documentation that the ODR may require and specified in the Supplementary General Conditions or Special Conditions.
- e. Contractor Daily Reports.

13.3.2 On the basis of the review of the preliminary pay worksheet, the ODR and the A/E may require modifications and additional documentation prior to submitting it as a periodic invoice.

13.3.3 Contractor's Periodic Invoice. As soon as practicable, but in no event later than seven (7) days after receipt of the preliminary pay worksheet, the A/E and ODR shall meet at the Project Site with the Contractor for the monthly progress meeting (MPM) to review the periodic invoice and to observe the condition of the Work. At the MPM, the Contractor shall submit a periodic invoice reflecting the required modifications and additional documentation required by the ODR and the A/E. No periodic invoice shall be complete unless it fully reflects all required modifications, and all required documentation including the Contractor's affidavit are attached.

13.3.4 Certification by Architect/Engineer. As soon as practicable, but in no event later than five (5) days following the A/E's receipt of the Contractor's periodic invoice, the A/E shall review the same for completeness, and shall forward the periodic invoice to the ODR, together with the A/E's certificate that the application is complete and payable, or that it is incomplete, stating in particular what is missing. If the periodic invoice is incomplete, the Contractor shall make the required corrections

and resubmit the periodic invoice for processing in accordance with this §13.3.4. Should the A/E fail to certify and forward a complete periodic invoice to the ODR within the time specified, the periodic invoice shall be deemed approved by the A/E, and the Contractor shall be entitled to submit the periodic invoice directly to the ODR with an affidavit certifying the expiration of the A/E review period and providing such supporting documentation to confirm the expiration of the review period. Upon receipt of a periodic invoice, the Owner shall make payment as though the periodic invoice had been certified for payment by the A/E.

13.4 Owner's Duty to Pay. The Owner shall have no duty to pay the Contractor except upon receipt of:

- a. a periodic invoice executed by the Contractor, and certified by the A/E or
- b. receipt of a periodic invoice executed by the Contractor and accompanied by the contractor's signature certifying the failure of the A/E to timely certify a periodic invoice, pursuant to §13.3 (Progress Payments).

13.5 Retainage. The Owner shall withhold from each progress payment, as retainage, the amount authorized by law. Retainage so withheld shall be managed in conformance with Subchapter B, Chapter 2252, Texas Government Code.

13.5.1 TAMUS Retainage Policy. The Texas A&M University System, as the Owner, shall withhold an amount equal to 5% of the Work completed to date and materials suitably stored in accordance with §13.3 (Progress Payments).

13.6 Reduction to Cover Loss. The Owner may reduce any periodic invoice prior to payment to the extent necessary to protect the Owner from loss on account of actions of the Contractor, including, but not limited to:

- a. Defective Work not remedied;
- b. Damage to the work of a separate contractor;
- c. Failure to maintain scheduled progress;
- d. Failure to comply with the requirements of Texas Government Code, Chapter 2258 (Prevailing Wage Rates); or
- e. For Contracts with a value of less than \$25,000 for which no payment bond is required, receipt of written notice by the Owner of unpaid bills, filed in conformance with § 53.232, Texas Property Code. Any funds so withheld shall be released to the Contractor if he furnishes a bond for release of lien as provided in § 53.236, Texas Property Code or the unpaid debt is satisfied.

13.7 Title to all material and Work covered by progress payments transfers to the Owner upon payment. Transfer of title to the Owner does not relieve the Contractor of the responsibility for the care and protection of materials and Work upon which payments have been made, or the restoration of any damaged Work, or waive the right of the Owner to require the fulfillment of all the terms of the Contract.

13.8 Progress payments to the Contractor shall not release the Contractor or its surety from

any obligations under this Contract.

Article XIV - Closing Inspections

- 14.1 Substantial Completion Inspection. When the Contractor considers the entire Work Substantially Complete, the Contractor shall so notify the ODR and the A/E in writing that the Work will be ready for Substantial Completion inspection on a specific date. The Contractor shall include, with this notice, a list of items to be completed or corrected prior to the final inspection. On the date indicated by the Contractor, or as soon thereafter as is practicable, the ODR, the A/E, and the Contractor shall inspect the Work and if the A/E and the ODR determine that the Work is Substantially Complete, a Certificate of Substantial Completion shall be issued by the ODR to the Contractor, establishing the date of Substantial Completion. The A/E and the ODR shall submit with this certificate, a list of items (the pre-final punchlist) to be completed prior to final inspection. This list may include additional items not included on the Contractor's list, which are deemed necessary by the A/E and/or the ODR to correct or complete prior to final inspection.
- 14.2 Final Inspection The Contractor shall fully complete the list of items listed on the prefinal punchlist prior to the Final Inspection. Unless otherwise specified in Special Conditions, or otherwise agreed in writing by the parties, the Contractor shall make a good effort to complete this Work within thirty (30) days of the date of Substantial Completion. When the Contractor has completed the prefinal punchlist, Written Notice shall be given to the ODR and A/E that the Work will be ready for Final Inspection on a specific date. On this date, or as soon thereafter as practicable, the ODR, the A/E and the Contractor shall inspect the Work and the A/E and ODR shall submit to the Contractor the final punchlist which the ODR and the A/E have determined requires correction or completion before the Work will be accepted.
- 14.3 The Contractor shall correct or complete all items on the final punchlist before acceptance and final payment. Unless otherwise specified in the Special Conditions, or otherwise agreed to in writing by the parties, the Contractor shall complete this work within seven (7) days of receiving the final punchlist. Upon completion of the final punchlist, the Contractor shall notify the A/E and ODR, and they shall promptly inspect the completed items. When the final punchlist has been completed, the Contract is fully performed according to the Contract Documents and is acceptable to the ODR, a certificate establishing the date of Final Completion shall be issued. Final Completion shall be a condition precedent to the Contractor's right to receive final payment.
- 14.4 Annotation. Any Certificate issued under this Article may be annotated to indicate that it is not applicable to specified portions of the Work.
- 14.5 Purpose of Inspection. Inspection by the Owner and the A/E is for the purpose of determining the completion of the Work, and does not relieve the Contractor of its responsibility for completing the Work in a good and workmanlike fashion, in compliance with the Contract Documents. Failure of the Owner or the A/E to

identify Work that is not in compliance with the Contract Documents, or which is defective in operation or workmanship, or acceptance of the Work with punchlist items left incomplete, does not constitute a waiver of such a defect or of the Owner's rights under the Contract Documents or relieve the Contractor of warranties contained in Article XVII (Contract Warranty and Guarantee).

14.6 Additional Inspections.

14.6.1 If, on the basis of the Substantial Completion inspection, the A/E and the ODR determine that the Work is not Substantially Complete, they shall give the Contractor Written Notice thereof, and shall inform the Contractor what Work was found to be incomplete, out of compliance with the Contract Documents, or defective in operation or workmanship, and setting a time in which incomplete or defective Work is to be completed or corrected. The Contractor shall complete or correct all Work so designated prior to requesting a second Substantial Completion inspection.

14.6.2 If, on the basis of the final inspection, the A/E and the ODR determine that the Work is not complete according to the Contract Documents, or that the Work required by the prefinal punchlist had not been performed, the A/E and the ODR shall give the Contractor Written Notice thereof, and shall inform the Contractor what Work was found to be incomplete, out of compliance with the Contract Documents or defective in operation or workmanship, and setting a time in which incomplete or defective Work is to be completed or corrected. The Contractor shall complete or correct all Work so designated prior to requesting a second final inspection.

14.6.3 This Contract identifies three closing inspections: the Substantial Completion inspection, the final completion inspection, and the inspection of completed final punchlist items. The cost to the Owner, of any and all additional inspections deemed necessary by the A/E and the ODR because the Work was not ready for one or more of these inspections, shall be borne by the Contractor, and the Owner may issue a Change Order, including a Unilateral Change Order, deducting these costs from the Contract amount. Upon the Contractor's written request, the Owner shall furnish documentation of all costs so deducted. Work added to the Contract by Change Order after final inspection shall not be considered as corrective work for purposes of determining timely completion or assessing the cost of additional inspections.

14.7 Phased Completion. The Contract Documents may provide that designated elements or parts of the Work shall be completed in phases. When phased completion is required, the provisions of Articles XIV (Closing Inspections) and Article XV (Early Occupancy) shall apply independently to each designated element or part of the Project. For all other purposes, unless otherwise agreed to in writing by the contracting parties, Substantial Completion of the Work as a whole shall be the date on which the last element or part of the Work to be completed is certified as

Substantially Complete, and final completion of the Work as a whole shall be the date on which the last element or part of the Work is certified as complete.

Article XV - Early Occupancy

- 15.1 Right of Occupancy. The Owner may occupy or use all or any portion of the Work following Substantial Completion, or at any earlier stage of completion, provided that such occupancy or use is consented to by any and all insurers of the Work. Should the Owner wish to use or occupy the Work, or a portion(s) thereof, prior to final completion, the ODR shall so notify the Contractor and the A/E in writing. Work performed on the premises by third parties on the Owner's behalf does not constitute occupation or use of the Work by the Owner for purposes of this Article.
- 15.2 Occupancy of Substantially Completed Work. If the Owner wishes to occupy all or a portion(s) of the Work that has been Substantially Completed, it shall so notify the Contractor and the A/E prior to the Substantial Completion inspection, and the A/E shall annotate the Certificate of Substantial Completion to set out, pursuant to §§ 14.4 (Annotation), 14.6 (Additional Inspections) or the parties' written agreement, the responsibilities of the Owner and the Contractor for maintenance, heat, utilities, operation of permanent equipment, and insurance. The Certificate of Substantial Completion shall be submitted to the ODR and the Contractor for their written acceptance of the responsibilities assigned to each of them in the Certificate. The executed Certificate shall have the effect of a Change Order. See Article XX (Change Orders).
- 15.3 Occupancy of Work Prior to Substantial Completion.
- 15.3.1. Notice and Early Occupancy Proposal. If the Owner determines that substantial hardship will result if it is unable to occupy all or some portion(s) of the Work prior to Substantial Completion, it shall so inform the A/E and the Contractor no less than thirty (30) days before the date the Owner wishes to occupy the Work, and designate those portions of the Work to be occupied and the uses to be made of the occupied premises. As soon as practical, but not less than five (5) working days after receiving this notice, the Contractor shall make the designated portions of the Work available to the A/E and the ODR for inspection. The A/E and the ODR shall inspect the Work jointly with the Contractor. As soon as practical, but not later than the third day next following the date of the inspection, an early occupancy proposal shall be prepared and submitted by the Contractor to the A/E and the ODR. The early occupancy proposal shall specify any Work that must be completed or corrected as well as any operation and maintenance manuals or other documentation necessary for the Work to be occupied by the Owner and used for the purposes designated by the ODR in its notice. The early occupancy proposal shall set out the responsibilities of the Owner and the Contractor for utilities, security, maintenance, insurance and liability for damage to the Work or damage arising from the condition of the Work. The early occupancy proposal shall also specify whether the area to be occupied must be

Substantially Complete before occupation, and shall specify the date for Substantial Completion of the Work to be occupied if other than the date previously specified by the Contract Documents.

- 15.3.2. Early Occupancy Implemented by Change Order. The early occupancy proposal shall be implemented by an Interim Change Authorization pursuant to the provisions of § 21.5 (Interim Change Authorization), except that the Contractor shall submit a COP as soon as possible, but not later than the seventh (7th) day next following receipt of the early occupancy proposal. All cost adjustments, including any increased costs of insurance, related to the early occupancy proposal, shall be stated in the COP; any such relief not so requested shall be deemed waived by the Contractor. If the early occupancy proposal requires early Substantial Completion, the Contractor shall be entitled to an equitable cost adjustment for acceleration and impact costs, to be submitted pursuant to §22.2 (Type II Changes). If an early Substantial Completion date is not required, the Contractor shall submit any claim for time extension as a Type I change in the Work and Interim Change Authorization. If, by the date designated by the Owner as the proposed date of occupancy, the ODR and the Contractor have not reached an agreement concerning the adjustment of time and/or cost, or the division of responsibility for the occupied portions of the Work, the ODR may issue a ULCO.
- 15.3.3. Project Completion with Early Occupancy. When, under the provisions of this Article, the Contract Time is modified for any part of the Work due to early occupancy, then the provisions of §14.6 (Additional Inspections) shall apply. All required documentation shall be furnished by the Contractor to the ODR on or before the date of early occupation by the Owner.
- 15.3.4. Non-waiver of Timely Completion. Early occupancy of any portion of the Work does not waive the Contractor's duty to complete the remaining Work within the Contract Time as specified in the Contract Documents or as subsequently modified by Change Order.

Article. XVI - Contract Final Acceptance and Payment

- 16.1 Prerequisite to Final Payment. Prior to being eligible for final payment, the Contractor shall submit to the Owner all project close-out documentation, including the maintenance and operating instructions and manuals, guarantees and warranties, certificates, record documents and all other items required by the Contract Documents. In addition, the Contractor shall submit the red-line marked construction drawings to the A/E for preparation of record drawings.
- 16.2 Initiation of Final Payment. At such time that all Work has been completed and accepted by the Owner, all documentation required by the Contract Documents has

been submitted to the Owner, the redline construction drawings submitted to the A/E, and a final Change Order has been approved by all parties, the ODR shall initiate the final payment process.

16.2.1 The final payment shall be determined by the final Contract Sum for the Contract less all previous payments to the Contractor on the Contract.

16.2.2 The Contractor shall include, with the final payment documents, a letter certifying that all payrolls, bills for materials and equipment, subcontracted work and other indebtedness connected with the Work have been paid or will be paid or otherwise satisfied within the period of time required by Chapter 2251, Texas Government Code (Payment for Goods and Services). If required by the ODR, the Contractor shall furnish documentation 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 ODR. The Owner is entitled to rely upon this certification for the purposes of making final payment.

16.2.3 The Contractor may not submit a claim on behalf of a Subcontractor or supplier, if that claim has not been noted as an exception in the letter of certification for payment of Contract obligations associated with the final payment process.

16.3 Architect/Engineer Approval. The A/E shall review a submitted application for final payment promptly, but in no event later than ten (10) days after its receipt. Prior to the expiration of this deadline, the A/E shall either:

(1) return the application for final payment to the Contractor with corrections for action and resubmission; and

(2) accept it, indicate approval and send to the Owner. Should the A/E fail to take action by the deadline specified, the application for final payment shall be deemed approved by the A/E. The Contractor shall be entitled to submit the application for final payment directly to the ODR with an affidavit certifying the passage of the A/E review deadline and providing such supporting documentation as to prove the passage of the deadline.

16.4 Offsets and Deductions: If the Certificate of Final Completion notes any Work remaining incomplete or defects not remedied, the Owner may deduct the reasonable cost of remedying such deficiencies from the final payment and issue a deductive Type I Change Order. If such deductions are made, the Owner shall identify each deduction made and the reason(s) therefore, and furnish the Contractor with an explanation of the deduction and the amount deducted by Change Order on or by the twenty-first (21st) day after the Owner's receipt of an approved, or deemed approved application for final payment.

16.5 Final Payment Due. Final payment shall become due and payable by the Owner,

subject to all Change Orders and payments to date, on the thirty (30th) day next following the receipt of the approved or deemed approved Application for Final Payment. If the Contractor disputes any amount deducted by Change Order, the Contractor shall give notice of the dispute on or before the thirty (30th) day next following receipt of final payment; failure to do so will bar any subsequent claim for payment of amounts deducted.

16.6 Effect of Final Payment: Final payment shall constitute a waiver of all claims by the Owner relating to the condition of the Work except those arising from:

- a. faulty or defective Work appearing after Substantial Completion;
- b. failure of the Work to comply with the requirements of the Contract Documents;
- c. terms of any special warranties required by the Contract Documents, and
- d. claims arising from personal injury or property damage to third parties. Final payment shall constitute a waiver of all claims by the Contractor except those specifically enumerated at the time of final payment. Provided, however, that the Contract shall not be deemed fully performed and closed until the expiration of all periods provided under the Contract Documents for the Contractor to submit a claim or protest a ULCO.

Article XVII - Contract Warranty and Guarantee

17.1 Contractor's General Warranty and Guarantee. The Contractor warrants to the Owner that all Work has been executed in accordance with the Contract Documents, complete in all parts and in accordance with generally accepted standards and practices, and with the best finish and workmanship. Unless otherwise specified, all materials and equipment incorporated in the Work under the Contract shall be new. The Owner may, at its option, agree in writing to waive any failure of the Work to conform to the Contract Documents, and to accept a reduction in the Contract Price for the cost of repair or diminution in value of the Work by reason of such defect. Absent such a written agreement, however, the Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute and is not waived by any inspection or observation by the Owner, the A/E or others, or by making any progress payment or the final payment, except as provided in §16.6 (Effect of Final Payment), or by the use or occupancy of the Work or any portion thereof by the Owner, at any time, or by any repair or correction of any defect made by the Owner.

17.2 Warranty Period. Except as otherwise specified, the Contractor shall repair all defects in materials, equipment or workmanship appearing within one year from the date of Substantial Completion of the Work as a whole. Upon Written Notice from the Owner regarding the discovery of any defects, the Contractor shall promptly, and at its own cost, remedy the defect(s) and replace any property damaged therefrom. In case of emergency, where delay would cause serious risk of loss or damage to the

Owner, or if the Contractor, after being notified, fails to proceed promptly to remedy within 30 days, or within another period of time which has been agreed to in writing, in compliance with the terms of the warranty and guarantee, the Owner may have the defect(s) corrected and the Contractor and the Surety shall be liable for all expenses incurred.

17.2.1 One Year Warranty Inspection Prior to the expiration of the warranty the ODR will initiate an inspection of the project with the Contractor and the A/E for the purpose of identifying any defect(s) or items not in accordance with the Contract Documents.

17.3 Separate Warranties. Where a particular piece of equipment or component of the Work for which a separate warranty is required under the Contract Documents is placed in continuous service before Substantial Completion, the date of service commencement shall be certified by the A/E and the ODR and the warranty period for that equipment or component shall run from the date so certified. In addition to the Contractor's warranty and duty to repair, as set forth in §17.1 (Contractor's General Guaranty and Warranty) and §17.2 (Warranty Period), the Contractor expressly assumes all warranty obligations required under the Contract Documents for specific building components, systems and equipment. The Contractor may satisfy any such obligation by obtaining and assigning to the Owner a complying warranty from a manufacturer, supplier, or Subcontractor. When an assigned warranty is tendered and accepted by the Owner which does not fully comply with the requirements of the Contract Documents, the Contractor shall remain liable to the Owner for all elements of the required warranty that are not provided by the assigned warranty.

Article XVIII - Good Faith Effort Subcontracting Program (HUBs)

18.1 General Program Description. State agencies are required by statute to make a good faith effort to assist Historically Underutilized Businesses (HUBs) in participating in contract awards issued by the State. The Texas Building and Procurement Commission rules, 1 TAC 111.11-111.28, outline the state's policy to encourage outreach to and potential utilization of HUBs in state contracting opportunities through race, ethnic, and gender neutral means. The goal of this program is to promote full and equal business opportunity for all businesses in state contracting in accordance with the goals specified in the State of Texas Disparity Study.

A Contractor, who contracts with the State for an amount in excess of \$100,000, shall be required to make a good faith effort to award subcontracts to HUBs in accordance with TAC Rule 111.14. The Contractor shall submit a HUB Subcontracting Plan (HSP) at the time of bidding, and if the HSP is acceptable to the Owner and a contract awarded the Contractor shall comply with the HSP for the duration of the Contract. The annual program goal for building construction contracts that an agency expects to award in a fiscal year is 25.1% for Black Americans, Hispanic Americans, and American Women, and 1.0% for Asian Pacific Americans and Native Americans. The Commodity purchase goal is 12.6% of annual purchases. The goal for heavy construction (non-building) is 11.9% of annual purchases. These good faith effort

goals do not prevent any business group from participating in contracting opportunities with the State of Texas.

- 18.2 Compliance with Accepted HUB Subcontracting Plan. The Contractor, having been awarded this Contract in part by complying with the HUB Program statute and rules, hereby covenants to continue to comply with the HUB Program as follows.

The Contractor shall:

- a. Prior to substituting a Subcontractor, promptly notify the Owner in the event a change is required, for any reason, to the accepted HUB Subcontracting Plan;
- b. Conduct the good faith effort activities required and provide the Owner with necessary documentation to justify approval of a change to the accepted HUB Subcontracting Plan;
- c. Cooperate in the execution of a Change Order or such other approval of a change in the HUB Subcontracting Plan as the Contractor and the Owner may agree to;
- d. Maintain and make available to the Owner, upon request, business records documenting compliance with the accepted HUB Subcontracting Plan;
- e. Upon receipt of payment for performance of Work, the Contractor shall submit to the Owner a compliance report, in the format required by the Owner, that demonstrates the Contractor's performance of the HUB Subcontracting Plan;
- f. Promptly and accurately explain and provide supplemental information to the Owner to assist in the Owner's investigation of the Contractor's good faith effort to fulfill the HUB Subcontracting Plan and the requirements of TAC 111.14 (Subcontracts).

- 18.3 Failure to Demonstrate Good Faith Effort. Upon a determination by the Owner that the Contractor has failed to demonstrate a good faith effort to fulfill the Subcontracting Plan or any Contract covenant detailed above, the Owner may, in addition to all other remedies available to it, report the failure to perform to the Texas Building and Procurement Commission Vendor Performance and Debarment Program.

Article XIX - Concealed Site Conditions

- 19.1 The Contractor is responsible for having visited the Site and having ascertained pertinent local conditions such as location, accessibility, and general character of the Site or building, the character and extent of existing work within and adjacent to the Site, and any other work being performed thereon at the time of the submission of its proposal. Any failure to do so will not relieve the Contractor from responsibility for successfully performing the Work without additional expense to the Owner.
- 19.2 If, in the performance of the Contract, subsurface, latent or concealed conditions at the Site are found to be materially different from the information included in the Contract Documents, or if unknown conditions of an unusual nature are discovered differing materially from the conditions usually inherent in work of the character

shown and specified, the Contractor shall notify the ODR in writing of such conditions before proceeding with the Work. If necessary, the A/E and/or Owner shall develop a solution and provide it to the Contractor. If the solution prompts changes to the Contract Amount and/or Time, the Contract shall be adjusted under Article XX (Change Orders).

19.3 For environmental matters, see § 9.4 (Environmental Safety and Control).

Article XX - Change Orders

20.1 Change Order Defined. A Change Order is a written modification of the Contract between the Owner and the Contractor, signed by the Owner, the Contractor and the A/E.

20.2 Effect of a Change Order. A Change Order authorizes a modification in the scope of the Work or an adjustment in the Contract Sum or the Contract Time. Work performed under a Change Order is subject to all provisions of the Contract Documents.

20.3 Modifications for which a Change Order is Required. All changes in the scope of Work, the Contract Sum and the Contract Time shall be documented by a Change Order. Change Orders are the exclusive method for modifying the scope of Work, The HUB Plan, the Contract Sum or Contract Time. Neither the A/E nor the ODR may change the scope of the Work, the Contract Sum or the Contract Time by any method, expressed or implied, other than a Change Order.

20.4 Agreed Change Order and Unilateral Change Order. A Change Order may be either an Agreed Change Order or a Unilateral Change Order.

20.4.1 Agreed Change Orders. An Agreed Change Order is a Change Order jointly executed by the Owner, the Contractor and the A/E, in which each agrees to all of the terms of the Change Order.

20.4.2 Effect of An Agreed Change Order. The execution of an Agreed Change Order constitutes the full, final and complete settlement of all claims with regard to the modifications contained in the Change Order for foreseeable impacts on the Contract Sum or the Contract Time; provided, however, that an Agreed Change Order may be reformed by a written modification signed by the Contractor and the ODR, for the limited purpose of correcting an error in computation. A corrected Change Order will be issued to document such actions, when deemed necessary by the ODR.

20.4.3 Unilateral Change Order (ULCO). A Unilateral Change Order is a Change Order issued by the Owner without the agreement of the Contractor.

- 20.4.4 Effect of a Unilateral Change Order; Conversion to an Agreed Change Order. The issuance of a Unilateral Change Order does not prejudice any of the Contractor's rights to relief otherwise available under the Contract Documents. The Contractor may preserve such rights by submitting a written objection to the Unilateral Change Order within 30 days of receipt of the Unilateral Change Order. If the Contractor does not submit a written objection within that time, the Contractor shall be deemed to have accepted the terms of the Unilateral Change Order and the Unilateral Change Order shall have the full force and effect of an Agreed Change Order.
- 20.5 Who May Request Change Orders. Change Order Requests may be initiated by the Owner or by the Contractor as provided in §§20.6 and 20.7 (Type I, Type II Change Orders).
- 20.6 Type I Change Orders. A Type I Change Order adjusts the Contract Sum and/or Contract Time because of an actual or constructive change in the scope or character of the Work, which originates from the Owner or the A/E. Type I Change Orders are initiated in one of two ways:
- 20.6.1 Owner-Initiated Changes. The Owner, without invalidating the Contract, may order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions.
- 20.6.2 Contractor-Initiated Changes. If the Contractor claims that it will incur additional cost or time because of any document containing an interpretation of the Contract Documents, or instruction concerning the execution of the Work, issued by the Owner or the A/E, and constituting a constructive change in the scope or character of the Work, the Contractor may request a Change Order pursuant to this Article and, if appropriate, a Time Extension Request as provided by Article XXIV (Modification of the Contract Time).
- 20.6.3 Commencement of Work. The Contractor shall not commence work on a Type I Change Order prior to the receipt of a Change Authorization, or an Interim Change Authorization, as set out in §§ 21.3.3 (Change Order Authorization) and 21.5 (Interim Change Authorization), respectively.
- 20.7 Type II Change Orders. A Type II Change Order adjusts the Contract Sum and/or Contract Time because of a change in the conditions of performance of the Work that changes the cost and/or time required for performance without changing the scope of the Work to be performed under the Contract Documents. The Contractor may request a Type II Change Order under the following circumstances only:

- a. The occurrence of excusable, compensable delays as designated in § 24.1.3 (Non-weather Excusable Compensable Delay);
- b. Unanticipated physical conditions at the Site, pursuant to §19.2 (Concealed Site Conditions), which the A/E addresses by means of changes in the Drawings and Specifications, or unanticipated conditions at the Site as described in §§2.7 (Environmental Regulations) and 2.8 (Antiquities);
- c. The existence of errors, omissions and imperfections in the design documents which the A/E corrects by means of changes in the Drawings and Specifications;
- d. The failure of the Owner and/or the A/E to take timely actions required under the Contract Documents or to provide information required by the Contractor to proceed with the Work;
- e. The failure of the Owner to provide reasonable access to the Site;
- f. The failure of the Owner to timely provide materials which are to be furnished by the Owner under the Contract Documents;
- g. Detrimental or obstructive actions by the Owner or by separate contractors employed by the Owner; and
- h. The failure of the Owner to grant a meritorious request for time extension pursuant to Art XXIV (Constructive Acceleration).

20.8 Contractor's Risk of Performance. Except as expressly provided in this Article XX (Change Orders), the Contractor shall not be entitled to an increase in the Contract Sum or the Contract Time and shall bear full responsibility for all risks affecting the Contractor's cost of performance.

Article XXI - Administration of Change Order Requests

21.1 Time Extension Requests. All relief related to excusable and compensable delays, including monetary compensation for the delay itself, shall be governed by the provisions of Article XXIV (Modification of the Contract Time), and any time extension granted or compensation for delay shall be made pursuant to that Article. A single Change Order may be issued, adjusting both the Contract Time and the Contract Sum, where both arise from the same claim.

21.2 Requests for Cost Adjustment. All requests for adjustment in the Contract Sum shall be made as follows:

- 21.2.1. Owner-initiated Type I Change Orders. When the Owner wishes to order changes in the Work, the ODR shall submit to the Contractor a Change Order Request (COR), consisting of a description of the request, including such Drawings and Specifications as are reasonably necessary to inform the Contractor of the nature of the change. Within thirty (30) days of receipt of the Owner's COR, the Contractor shall submit a Change Order Proposal (COP) to the ODR, stating that the proposed change is a no-cost change, or proposing an adjustment in the Contract Sum, as provided under Article XXII (Pricing Change Order Work). When an Owner-

initiated change in the Work requires no increase in cost, the ODR shall issue a COA and the Owner and Contractor shall execute a Change Order.

- 21.2.2. Contractor-initiated Changes. When the Contractor considers that any written instruction or interpretation of the Contract Documents issued by the Owner and/or the A/E constitutes a change in the Work affecting the Contract Sum, the Contractor shall notify the Owner as soon as possible, but not later than fifteen (15) days after receipt of the instruction or interpretation, and shall submit a COP to the ODR as soon as possible thereafter, but not later than thirty (30) days after issuance of the notice. This COP shall contain a proposal for an adjustment in the Contract Sum, as provided under Article XXII (Pricing Change Order Work). The COP shall be accompanied by a copy of the document containing the instruction or interpretation, evidence of the date the Contractor received the document and an explanation of how the document creates the need for a Change Order.
- 21.2.3. Notice of Claim for Type II Change Orders. If the Contractor claims that additional cost is involved because of the occurrence of one or more of the circumstances set forth in §20.7 (Type II Change Orders), the Contractor shall give the ODR Written Notice of the intent to submit a claim and shall proceed immediately to document all increased costs actually incurred as a result. Such notice shall be given as soon as the Contractor becomes aware that such circumstances exist, but not later than thirty (30) calendar days after the onset of the circumstance giving rise to the claim. This notice shall identify:
- a. the circumstances giving rise to the additional cost;
 - b. the elements of cost affected; and
 - c. the claimed contractual basis for entitlement to relief. Such notices shall be accompanied by sufficient written evidence to document the occurrence of a cost impact, but the full amount of the claim need not be stated at the time the notice is given to the ODR. The Contractor and the Owner recognize and agree that it is beneficial to identify factors affecting the Contractor's cost of performance, and to take prompt action to control them. Therefore, it is agreed that the Contractor shall not be entitled to request a Type II Change Order cost adjustment unless the required notice is submitted timely.
- 21.2.4. Submission of Claim for Type II Change Orders. Claims for adjustment of the Contract Sum by Type II Change Orders shall be made in the form of a COP submitted to the ODR no later than ninety (90) calendar days after the cessation of the circumstances giving rise to the claim. The COP shall set forth the Contractor's proposed cost adjustment, computed pursuant to Article XXII (Pricing Change Order Work), together with the Contractor's documentation of costs incurred.
- 21.3 Processing Requests for Change Orders.

- 21.3.1 Response to COP. As soon as possible, but not more than thirty (30) days after receipt of any COP submitted by the Contractor, the ODR shall respond in writing by either:
- a. accepting the Contractor's proposal,
 - b. rejecting the same,
 - c. initiating negotiations with the Contractor concerning the proposed cost adjustment, or
 - d. requesting additional information.
- 21.3.2 Effect of Owner's Failure to Respond Timely. If the ODR, without justification, fails to respond to the Contractor in writing during the required time, the Contractor's COP shall be deemed accepted as proposed as of the thirty-first (31st) day next following the receipt of the COP by the ODR, and shall be administered as a COA and incorporated in the next Change Order.
- 21.3.3 Change Order Authorization. When agreement has been reached concerning the adjustment of cost, the ODR shall accept the Contractor's COP, or any subsequently revised COP issued pursuant to negotiation, by endorsing the COP "Accepted", dating, and returning it to the Contractor. A COP that has been accepted is a Change Order Authorization (COA). A COA is effective upon transmittal and to the Contractor it constitutes the Notice to Proceed for the changed Work and entitles the Contractor to submit the adjusted cost of the Work on succeeding pay applications, as it is completed. The COA will be incorporated into the next Change Order.
- 21.3.4 Execution of Change Order. Not more than forty-five (45) days following the date of acceptance noted on the COA, or the deemed effective date pursuant to §21.3.2 (Effect of Owners Failure to Respond Timely), but not later than the ninetieth (90th) day following the date of Substantial Completion, the ODR shall issue a Change Order, for execution by the Contractor, the Owner and the A/E, attaching a copy of the accepted COA and incorporating it fully by reference. The Contractor shall execute the Change Order within ten (10) days of receipt.

21.4 Unilateral Change Orders.

- 21.4.1 For any Type I or Type II change, the ODR may issue a Unilateral Change Order (ULCO), establishing such cost adjustment, if any, as the Owner deems fair and reasonable, under the following circumstances:
- a. If the Contractor fails to submit a COP within the time required under §§21.2.1 (Contractor-Initiated Type I Change Order) and 21.2.2 (Owner-Initiated Type II Change Order), or fails or refuses to execute an Change Order within the time required by §21.3.4 (Execution of Change Order);
 - b. If negotiations fail to achieve an agreed price; and

- c. If, in the Owner's judgment based on the Work Progress Schedule, the Contractor fails to proceed with a Type I Change Order which may adversely affect the timely completion of the Work.
- d. In addition to the above, the ODR shall issue a ULCO on any COP that remains unresolved ninety (90) days after Substantial Completion of the Project.

21.4.2 A ULCO is effective upon transmittal to the Contractor. The ULCO obligates the Contractor to perform the Work according to its terms, and authorizes the Contractor to submit the adjusted cost of the Work on succeeding pay applications.

21.4.3 The issuance of a ULCO does not prejudice any of the Contractor's rights to relief otherwise available under the Contract Documents. The Contractor may preserve such rights by submitting a written objection to the ULCO within thirty (30) days of receipt of the ULCO. If the Contractor does not submit a written objection within that time, the Contractor shall be deemed to have accepted the terms of the ULCO and the ULCO shall have the full force and effect of an Agreed Change Order.

21.5 Interim Change Authorization. If the Owner determines that an Owner-initiated Type I change in the Work, or a written instruction or interpretation of the Contract Documents for which the Contractor has given notice of its intent to initiate a Type I claim, may impact or damage the Work in place, or cause significant delay in the Project schedule or the need to maintain safety, the ODR may issue an Interim Change Authorization (ICA) directing the Contractor to proceed with the changed Work before submitting a COP. The ICA shall authorize the Contractor to bill for the changed Work completed on the basis of either:

- a. time and materials,
- b. cost not to exceed a specified amount or
- c. a combination of (1) and (2).

Upon receipt of an ICA, the Contractor shall proceed immediately to document all increased costs actually incurred as a result of the Work required under the ICA which shall be submitted to the ODR for verification. At any time prior to the completion of the changed Work, the Contractor may submit a COP containing a lump sum proposal for the cost of the changed Work, which shall be administered as a Type I Change Order; provided, however, that if the Work is completed prior to acceptance of the Contractor's COP by the ODR, the Contractor's adjustment of the cost shall be limited to the actual cost of the Work. If the ODR determines that a Contractor initiated Type I Change Order is without merit, the ODR shall notify the Contractor to proceed according to the subject written interpretation or instruction. Such a notice to proceed shall have the same effect as a Unilateral Change Order pursuant to §20.4.4 (Effects of an Unilateral Change Order, Conversion to an Agreed Change Order), and the Contractor's rights shall be as set forth in that subsection.

Article XXII - Pricing Change Order Work

22.1 Lump Sum Cost Proposals. All proposals for an adjustment in the Contract Sum shall be made on a lump sum basis, setting forth the Contractor's estimated or actual costs attributable to the changed Work only. The proposed lump sum cost adjustment shall consist of a base cost, reflecting the Contractor's actual or estimated cost of performing the changed Work, in the case of a Type I change, or the increased cost of performance in the case of a Type II change. If the Contractor believes that the mark-up is insufficient to cover actual or anticipated impact costs, the Contractor may submit a Type II change request for these additional costs. These lump sum cost provisions also apply to Work performed by or claims submitted by Subcontractors as part of the Contractor's COP.

22.1.1 Base Cost Computation for Type I Changes. The base cost computation includes the following elements only, as relevant:

- a. The total cost of materials and supplies, incorporated into the Work reflecting all available discounts, itemized by unit cost and quantity;
- b. The total cost of all labor for performing the additional Work, including supervision below the level of Project Superintendent, itemized to show manhours by trade and classification, burdened hourly rates, and total labor cost;
- c. The equipment cost calculated for each type of equipment used in performing the changed Work, based on hours of use, and multiplied by the most recent version of the Rental Rate Blue Book for Construction Equipment (published by Primedia Information, Inc.) to yield total cost. Mobilization costs will not be allowed except when the Contractor demonstrates that the need to mobilize a piece of equipment arose solely because of the changed Work;
- d. All transportation costs for delivery and handling of materials, equipment and supplies, and the removal of waste or debris; and
- e. All storage costs in excess of thirty (30) days for materials and supplies, if necessitated solely by the changed Work.
- f. The cost of small tools will not be allowed.
- g. The cost of per diem or travel will not be allowed.

22.1.2 Mark-up on Type I Changes.

The base cost of Type I changes may be marked up to cover the Contractor's profit, general conditions costs, scheduling costs, bonding and insurance costs, home office, and all other costs associated with the performance of the Work. The mark-up also covers all foreseeable impact costs on unchanged Work.

- a. The amounts that the Contractor and/or its Subcontractors may add to a Change Order for mark-up to the base cost, which is the sum of the cost of the changed Work identified as items a-f in §22.1.1 (Base Cost Computation for Type I Changes), are as follows:

1. For each Contractor or Subcontractor contractually above the performing Subcontractor, a sum equal to 8% of the total in 22.1.1 (Cost Computation for Type I Changes) may be added to the cost for markup.
 2. For work performed by the Contractor's or Subcontractor's own forces a sum equal to 20% may be added to the total in 22.1.1 if the sum is greater than \$3,000.00. If the sum is less than \$3,000.00 a sum equal to 25% may be added.
 3. A minimum of \$50.00 will be allowed for markup on any Type 1 Change.
- b. On changes involving both additions and deletions, percentages for mark-up will be allowed only on the net addition.

22.1.3 Unit Prices. Unit prices bid by the Contractor, or subsequently agreed upon, by the Contractor and the ODR shall include only those cost elements as those set out in §22.1.1 (Base Cost Computation for Type I Changes), §22.1.2 (Mark-up on Type I Changes).

22.2 Cost Computation for Type II Changes.

22.2.1 Costs and documentation. For a Type II change, the COP shall include a reasonably detailed narrative setting forth:

- a. the nature of the cost impact and its cause,
- b. the basis of the Contractor's claim for entitlement to a cost adjustment,
- c. description and documentation of steps taken by the Contractor to mitigate the claimed cost impact, and
- d. such other information that the Contractor considers necessary to justify its claim. The cost adjustment proposal for a Type II Change shall be based on itemized documented costs actually incurred. If, and only if, the actual cost claimed cannot be demonstrated with reasonable certainty, the Contractor may utilize mathematical formulas or models to compute the proposed cost adjustment, but no COP will be valid unless accompanied by documentation showing that the increased costs claimed, in fact, resulted from the alleged cause.

22.2.2 No Mark-up Authorized. No mark-up is authorized on the cost of a Type II claim.

22.2.3 Certification. On COPs for Type II changes, the Contractor shall certify in writing that all information contained in the COP is true and correct, and that the costs claimed were incurred as a result of the alleged cause, and were reasonably necessary for the performance of the Work. In the case of Subcontractor pass-through claims, the Contractor shall further certify that the claim stated by the Subcontractor constitutes a legitimate claim

against the Contractor, that it is not barred by the terms of the subcontract, and whether, and to what extent, the claim has been paid by the Contractor. The Contractor may not subsequently modify a claim that has been so certified except for the correction of errors. No Type II COP shall be considered valid that has not been so certified.

22.2.4 Cost Computations Under Interim Change Authorizations. When the Owner issues an ICA authorizing the Contractor to proceed on:

- a. a time and materials basis,
- b. a cost not to exceed basis, or
- c. a combination of (1) and (2),

The Contractor may submit the cost of the Work completed to date for payment, as authorized by the ICA, in succeeding pay applications. Any time after receipt of an ICA, the Contractor may submit a COP proposing a lump sum cost for the changed Work, which shall be processed as a Type I change under §22.1 (Lump Sum Cost Proposals).

Article XXIII - Time Allotted for Performance; Construction Schedules

23.1 Contract Time. The Contract Time will be measured from the date designated in the Notice to Proceed and shall be completed in the time specified in the Contract Documents, including any modification by Change Order. Failure to achieve Substantial Completion within the Contract Time will subject the Contractor to Liquidated Damages as provided in § 24.3.1 (Collection of Liquidated Damages). Unless otherwise specified in the Special Conditions or elsewhere in the Contract Documents, the date of Contract completion shall be the date on which the Work is certified as Substantially Complete, pursuant to Article XIV (Modification of the Contract Time).

23.2 Work Progress Schedule. Within sixty days of the Notice-to-Proceed, the Contractor shall submit, in duplicate, to the Owner and third copy to the A/E, for review and acceptance, a proposed Work Progress Schedule. The Work Progress Schedule shall show the dates for starting and completing the various component activities making up the Work, and the logical relationships between them, and shall be in a format and in sufficient detail to permit the Work to be competently managed and its progress monitored. Unless otherwise provided in the Supplementary General Conditions, Special Conditions or Division I of the Specifications, the schedule should utilize the Critical Path Method. The Work Progress Schedule shall take into account the time required for the preparation and review of required Shop Drawings and submittals. If required by the Supplementary General Conditions, Special Conditions or Division 1 of the Specifications, the Contractor shall also submit a separate submittal schedule, correlated with the Work Progress Schedule that shows the dates the Contractor intends to make the required submittals.

23.2.1 Schedule Requirements. The Work Progress Schedule should be an

accurate and reliable representation of the progress of the Work to date, and of the Contractor's actual plans for its completion. The Work Progress Schedule shall be capable of measuring completed events and forecasting the effect of delaying events on uncompleted activities. Submittal of a schedule, schedule revision or schedule update constitutes the Contractor's representation to the Owner and the A/E that the Contractor will follow the schedule as submitted in performing all Work not yet completed, and that all progress to date shown on the schedule is accurately depicted.

- 23.2.2 Schedule Updates. The Work Progress Schedule and submittal schedule, shall be updated periodically to reflect progress to date, and current plans for completing the Work. The form and contents of the updates, and the required update interval, shall be as specified the Supplementary General Conditions, the Special Conditions or Division I of the Specifications. The updated Work Progress Schedule shall be submitted to the Owner, and the A/E for acceptance, and the Owner shall have no duty to make progress payments until the updated Work Progress Schedule has been submitted. The Contractor shall show the anticipated date of completion reflecting all extensions of time granted as of the date of the update. The Contractor may revise the Work Progress Schedule at any time when, in the Contractor's judgment, it becomes necessary for the management of the Work. The Contractor shall submit any schedule revision to the Owner and the A/E for acceptance before it is implemented.
- 23.2.3 Effect of Schedule Submittal. Submittal of the Work Progress Schedule, and successive updates or revisions, are for the information of the Owner and the A/E, and to permit the coordination of their activities with those of the Contractor. The Owner and the A/E shall accept or reject the submittal of a Work Progress Schedule within the same period allowed for review of other submittals in accordance with Article XI (Shop Drawings and Submittals). Acceptance of a schedule, schedule update or revision constitutes the Owner's agreement to coordinate its' own activities with the Contractor's activities as shown on the schedule. Acceptance of a Work Progress Schedule, update or revision does not indicate the approval of the Contractor's proposed sequences and duration. Acceptance of a Work Progress Schedule update or revision indicating late completion does not constitute the Owner's consent to a late finish, or waive either the Contractor's responsibility for timely completion or the Owner's right to damages for the Contractor's failure to do so.
- 23.2.4 Ownership of Float. Float time contained in the Work Progress Schedule is not for the exclusive benefit of the Contractor or the Owner, but may be consumed by either as needed.

Article XXIV - Modification of the Contract Time

24.1 Delays and Extension of Time. When a delay, defined herein as excusable, prevents the Contractor from completing the Work within the Contract Time, the Contractor shall be entitled to an extension of time, as set forth in §24.1.3 (Non-Weather Excusable Compensable Delay), and in certain instances to compensation for the direct cost of delay. The Contract Time shall be extended by the number of working days lost by reason of the excusable delay, as measured by the Contractor's Work Progress Schedule (or current update). All extensions of time shall be given in Calendar Days. However, in no event will an extension of time be granted for delays that merely extend the duration of non-critical activities, or which consume only float without delaying the project completion date.

All adjustments to the Contract Time shall be by Change Order, as provided under Article XX (Change Orders).

24.1.1 Time Extensions for Weather Days. A "weather day" is a day on which the Contractor's current schedule indicates Work is to be done, on which inclement weather and related site conditions prevented the Contractor from performing seven hours of Work between the hours of 7:00 AM and 6:00 PM. Weather days are excusable noncompensable delays. At the end of each calendar month, the Contractor shall submit to the Owner and the A/E a list of weather days occurring in that month. The ODR and the A/E shall meet with the Contractor to discuss and resolve any disagreements concerning the number of weather days. If by the close of the seventh (7th) business day after the Owner's receipt of the Contractor's list, the Contractor and the Owner have not reached an agreement on the total number of days in the month in accordance with the rainfall table in the Special Conditions, and signed a memorandum to that effect, the Owner in its sole discretion shall determine the number of days it will allow, and the completion time shall be adjusted accordingly by Change Order. The Owner shall so notify the Contractor in writing by 5:00 PM on the next business day. Should the Owner fail to do so, the Contract Time shall be extended by the number of weather days claimed by the Contractor. The requirements of §24.2 (Time Extension Requests) concerning requests for time extension shall not apply to requests for extensions of time for weather days, which are governed by this section alone. The Contractor's only relief for delay for weather days will be a time extension.

24.1.2 Non-Weather Excusable Noncompensable Delay. The Contractor shall be entitled only to an extension of time for unforeseeable delays not within the control of or arising from the fault of either the Contractor or the Owner caused by the following:

- a. Unusual delay in the delivery of materials, components or equipment to be incorporated into the Work. Strikes and labor disputes (but not the availability of adequately skilled labor, unless such impact is caused solely by the conduct of the Owner);

- b. Physical damage to the Work caused by circumstances beyond the control of the Contractor;
- c. War, civil unrest or insurrection;
- d. Other unforeseeable causes beyond the control of either the Contractor or the Owner.

24.1.3 Non-Weather Excusable Compensable Delay. The Contractor shall be entitled to an equitable adjustment of cost, as well as a time extension for delays, caused by the following:

- a. Failure of the Owner or the A/E to take timely actions required under the Contract Documents, or to provide information required by the Contractor to proceed with the Work in a timely manner.
- b. Detrimental or obstructive actions by separate contractors employed by the Owner.
- c. Failure of the Owner to provide access to the Site of the Work.
- d. Failure of the Owner to provide materials, consistent with the Work Progress Schedule, which are to be furnished by the Owner under the Contract Documents.
- e. Errors, omissions and imperfections in the design which the A/E corrects by means of changes in the Drawings and Specifications.
- f. Unanticipated physical conditions at the Site which the A/E corrects by means of changes to the Drawings and Specifications.
- g. Changes in the Scope of Work ordered by the Owner or the A/E.
- h. Suspensions for cause under § 24.1.4 (Suspension of Work for Cause), which are determined not to have been within the control of the Contractor; or
- i. Suspensions for convenience under § 24.1.5 (Suspension of Work for Owner's Convenience), which prevents the Contractor from completing the Work within the Contract Time.

The Contractor's compensation in the event of such delays shall be the cost of extended general conditions for the period of delay. In the event that additional direct costs are incurred solely as a result of the delay, they shall be determined pursuant to Article XXII (Pricing Change Order Work).

24.1.4 Suspension of Work for Cause. The Owner may, at any time without prior notice, suspend all or any part of the Work, if, in the Owner's sole discretion, it is considered reasonably necessary to do so to prevent or correct, any condition of the Work, which constitutes an immediate safety hazard, or which may reasonably be expected to impair the integrity, usefulness or longevity of the Work when completed. The Owner shall give the Contractor a Written Notice of suspension for cause, setting forth the reason for the suspension and identifying the Work to be suspended. Upon receipt of such notice, the Contractor shall immediately stop the

Work so identified. As soon as practicable following the issuance of such a notice, the Owner, with the assistance of the A/E, shall initiate and complete an investigation of the circumstances giving rise to the suspension, and shall issue a written determination of their causes. The Contractor will not be entitled to an extension of time or compensation for delay resulting from a suspension if the Owner's investigation determines that the cause was within the control of the Contractor. If the cause is determined not to have been within the control of the Contractor, and the suspension prevents the Contractor from completing the Work within the Contract Time, the suspension is an Excusable Compensable Delay. Suspensions of work under this provision shall be no longer than is reasonably necessary to identify and remedy the conditions giving rise to the suspension.

- 24.1.5 Suspension of Work for Owner's Convenience. Upon seven (7) calendar days' prior written notice to the Contractor, the Owner may at any time without breach of the Contract suspend all or any portion of the Work for a period of up to thirty (30) days for its own convenience. The Owner shall give the Contractor a Written Notice of suspension for convenience, which shall set forth the number of days for which the Work, or any portion of it, will be suspended, and the date on which the suspension of Work shall cease. When such a suspension prevents the Contractor from completing the Work within the Contract Time, it is Excusable Compensable Delay. A notice of suspension for convenience may be modified by the Owner at any time upon seven (7) calendar days' prior Written Notice to the Contractor. If the Owner suspends the Work for its convenience for more than sixty (60) consecutive calendar days, the Contractor may elect to terminate the Contract pursuant to the provisions of Article XXV (Termination and Suspension of the Contract Prior to Completion).
- 24.1.6 Concurrent Delay. When the completion of the Work is simultaneously delayed by an excusable delay and a delay arising from a cause not designated as excusable under the Contract Documents, the Contractor shall be entitled only to a time extension, and not compensation, for the period of concurrent delay. When the completion of the Work is simultaneously delayed by an excusable compensable delay and an excusable non-compensable delay, the Contractor shall be entitled to a time extension and compensation, as provided under §24.1.3 (Non-Weather Excusable Compensation Delay).
- 24.1.7 Except as expressly provided in this § 24.1 (Delays and Extension of Time), the Contractor shall not be entitled to an extension of the Contract Time, and shall bear all responsibility for financial risks which may accrue from various causes of delay in the construction progress.

24.2 Time Extension Requests. If the Contractor believes that the completion of the Work has been delayed by a circumstance other than inclement weather designated as excusable under §24.1.3 (Delays and Extension of Time), Written Notice shall be given to the ODR, within thirty (30) calendar days after the onset of the event or circumstance giving rise to the excusable delay, stating the nature of the delay and the activities potentially affected. Such claims should be accompanied by sufficient written evidence to document the delay. In the case of a continuing cause of delay, only one claim is necessary. Claims for extensions of time shall be stated in numbers of whole or half calendar days. All requests for extensions of time not submitted in connection with proposed costs for changed or added work must be made in writing within thirty (30) calendar days after the cessation of the delay. Claims for the cost of Excusable Compensable Delays shall be submitted in writing within ninety (90) calendar days after the cessation of the cause of the delay. The Contractor and the ODR recognize and agree that it is beneficial to each to identify delays and make necessary schedule adjustments promptly, and that a Work Progress Schedule prepared and updated by the Contractor provides an effective tool for measuring and tracking the impact of delays. Therefore, it is agreed that no extension of time will be granted unless the required notice is submitted timely, and with sufficient documentation.

All changes to the Contract Time or Contract Sum made as a result of such claims shall be by Change Order, as provided under Article XX (Change Orders).

24.2.1 Contents of Time Extension Requests. Each time extension request shall be accompanied by a quantitative demonstration of the impact of the delay on Project completion time, based on the current Work Progress Schedule. Time extension requests shall include a reasonably detailed narrative setting forth:

- a. the nature of the delay and its cause,
- b. the basis of the Contractor's claim of entitlement to a time extension,
- c. documentation of the actual impacts of the claimed delay, and any concurrent delays,
- d. description and documentation of the steps taken by the Contractor to mitigate the effect of the claimed delay, including, when appropriate, the modification of the Work Progress Schedule, and
- e. such other information that the Contractor considers necessary to justify its claim for an extension of time. No time extensions shall be granted for delays that do not affect the Project completion time.

24.2.2 Owner's Response. The ODR shall respond to the time extension request by providing, to the Contractor, Written Notice of the number of days granted, and giving the reason(s) if this number differs from the number of days requested by the Contractor. Such an extension of time is effective on transmittal of the ODR's notice. A Change Order, reflecting

the extension of time, shall be executed by the parties in accordance with Article XX (Change Orders). The Owner will respond to each properly submitted time extension request within fifteen (15) calendar days following its receipt. If the ODR cannot reasonably make a determination about the Contractor's entitlement to a time extension within that time, the ODR shall so notify the Contractor in writing. Upon written concurrence from the Contractor, the ODR shall then have not more than thirty (30) additional calendar days to prepare a final response. If the Owner fails to respond within the agreed time, or in the absence of an agreement, within forty-five (45) calendar days from the date the time extension request was originally submitted, then the Contractor shall be entitled to a time extension in the amount requested.

24.3 Failure to Complete Work Within the Contract Time. Time is of the essence in this Contract. The Contractor's failure to complete the Work within the Contract Time will cause damage to the Owner. These damages shall be liquidated by agreement of the Contractor and the Owner, as set forth in the Special Conditions, the Proposal and the Contract.

24.3.1 Collection of Liquidated Damages. The Owner will collect Liquidated Damages due by reducing the Contract Sum by Change Order.

Article XXV - Termination and Suspension of the Contract Prior to Completion

25.1 Termination by Owner for Cause. The Owner may, without prejudice to any right or remedy, terminate the employment of the Contractor and take possession of the Site and of all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor, under the following circumstances:

- a. Persistent or repeated failure or refusal, except during complete or partial suspensions of Work authorized by the ODR under the Contract Documents, to supply enough properly skilled workmen or proper materials;
- b. Persistent disregard of laws, ordinances, rules, regulations or orders of any public authority having jurisdiction;
- c. Persistent failure to prosecute the Work in accordance with the Contract Documents, and to insure its completion within the time, or any extension thereof, specified in this contract;
- d. Failure to remedy defective Work condemned by the ODR pursuant to Article XII (Inspection of the Project During Construction);

- e. Failure to pay Subcontractors, laborers, materialmen and suppliers pursuant to Texas Government Code, Chapter 2251 Government Code;
- f. Persistent endangerment, by the Contractor or its Subcontractors or other vendors, and disregard of the safety of laborers or of the Work itself;
- g. Failure to supply or maintain statutory bonds, pursuant to Article V (Construction Bonds), or to supply or maintain required insurance, pursuant to Article VI (Insurance Requirements);or
- h. Any other material breach of the Contract.

The Owner reserves the right to terminate the employment of the Contractor at any time for any of the above listed causes. Failure to exercise the right to terminate in any instance or for any proper reason shall not be construed as a waiver of the right to do so in any other instance or for any other proper reason.

25.1.1 The ODR shall give the Contractor and its Surety thirty (30) days' prior Written Notice of its intent to terminate for any of the above reasons. If the Contractor or the Surety demonstrates, to the satisfaction of the Owner, that the condition or conditions upon which the notice of termination is based have been removed, corrected, or will not recur, then the ODR shall rescind the notice and the Contract shall continue unmodified, and the Contractor shall not be entitled an extension of time.

25.1.2. Should the Contractor or the Surety fail to so demonstrate within thirty (30) days following Written Notice, or fail to satisfy the Owner that the condition or conditions upon which the notice of termination is based have been removed, corrected, or will not recur, the Owner may arrange for completion of the Work and deduct the cost thereof from the unpaid Contract sum remaining, including the cost of additional A/E services made necessary by such default or neglect. In this event, no further payments shall be made to the Contractor by the Owner until all costs for completing the Work have been paid. If the unpaid balance of the Contract Sum exceeds the costs of finishing the Work, including compensation for the A/E's additional services made necessary thereby, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor or his Surety shall pay the difference to the Owner. This obligation for payment shall survive the termination of the Contract. The Owner reserves the right, when the Contract is terminated for cause, to take assignment of any and all contracts between the Contractor and its Subcontractors, and suppliers, and the ODR shall promptly notify the Contractor of the contracts that Owner elects to assume. Upon receipt of such notice, the Contractor shall promptly take all steps necessary to effect such assignment.

25.2 Termination for Convenience of Owner. The Owner reserves the right, without breach, to terminate the Contract prior to, or during the performance of the Work, for unforeseen causes not limited to court orders, loss of funding, acts of the federal government to discontinue the Work, etc., that may occur and render the Owner's continued performance of the Contract impossible or illegal. Upon such an occurrence, the following procedures will be adhered to:

- a. The Owner will immediately notify the A/E and the Contractor in writing, specifying the reason for and the effective date of Contract termination. Such notice shall also contain any instructions necessary for the protection, storage or decommissioning of incomplete Work or systems, and for safety.
- b. After receipt of the notice of termination, the Contractor shall immediately proceed with the following obligations, regardless of any delay in determining or adjusting any amounts due at that point in the Contract:
 1. Stop all work.
 2. Place no further subcontracts or orders for materials or services.
 3. Terminate all subcontracts.
 4. Cancel all materials and equipment orders, as applicable.
 5. Take actions necessary to protect and preserve all property related to this Contract which is in the possession of the Contractor.
- c. When the Contract is terminated for the Owner's convenience, the Contractor may recover payment from the Owner for all Work executed, including any additional Work required pursuant to the notice of termination, and for any provable loss and reasonable expenses attributable to the Work resulting from such termination.

25.3 Termination by Contractor. If the Work is stopped for a period of ninety (90) days under an order of any court or other public authority having jurisdiction, or as a result of an act of government, such as a declaration of a national emergency making materials unavailable, through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing any of the Work under a contract with the Contractor, then the Contractor may, upon thirty (30) additional days' Written Notice to the ODR, terminate the Contract and recover from the Owner payment for all Work executed and for any provable loss and reasonable expenses attributable to the Work resulting from such termination. If the cause of the work stoppage is removed prior to the end of the thirty (30) day notice period, the Contractor may not terminate the Contract.

25.4. Settlement on Termination. When the Contract is terminated for any reason, the Contractor shall, at any time within one hundred eighty (180) days of the effective date of termination, submit a final termination settlement proposal to the Owner

based upon recoverable costs as provided under §§25.1 (Termination by Owner for Cause), 25.2 (Termination for Convenience of Owner) or 25.3 (Termination by Contractor). If the Contractor fails to submit the proposal within the time allowed, the Owner may determine the amount due to the Contractor because of the termination and shall pay the determined amount to the Contractor. All settlements on termination shall be administered as Type I Change Orders as provided under Articles XX (Change Orders), XXI (Administration of Change Order Requests) and XXII (Pricing Change Order Work).

Article XXVI - Dispute Resolution

- 26.1 The dispute resolution process provided for in Chapter 2260 of the Texas Government Code shall be used, as further described herein, by the Owner and the Contractor to attempt to resolve any claim for breach of contract made by the Contractor.
- a) A Contractor's claim, for breach of this Contract, that the parties cannot resolve in the ordinary course of business shall be submitted to the negotiation process provided in Chapter 2260, Subchapter B, of the Texas Government Code. To initiate the process, the Contractor shall submit Written Notice, as required by Subchapter B, to the ODR. Said notice shall specifically state that the provisions of Chapter 2260, Subchapter B, are being invoked. A copy of the notice shall also be given to all other representatives of the Owner and the Contractor otherwise entitled to notice under the parties' Contract. Compliance by the Contractor with Subchapter B is a condition precedent to the filing of a contested case proceeding under Chapter 2260, Subchapter C, of the Texas Government Code.
 - b) The contested case process provided in Chapter 2260, Subchapter C, of the Texas Government Code is the Contractor's sole and exclusive process for seeking a remedy for any and all alleged breaches of contract by the Owner, if the parties are unable to resolve their disputes under subparagraph (a) of this article.
 - c) Compliance with the contested case process provided in Subchapter C is a condition precedent to seeking consent to sue from the Legislature under Chapter 107 of the Texas Civil Practices and Remedies Code.
- 26.2 The submission, processing and resolution of the Contractor's claim is governed by the published rules adopted by the State of Texas Attorney General pursuant to Chapter 2260, as currently effective, hereafter enacted or subsequently amended. These rules are found at (TAC §155).

- 26.3 Neither the occurrence of an event nor the pendency of a claim constitutes grounds for the suspension of performance by the Contractor, in whole or in part.

Article XXVII - Miscellaneous

- 27.1 Written Notice. Written notice shall be considered to have been duly given if a document is delivered in person to the individual or member of the firm or to an officer of the corporation for whom it is intended; if delivered or sent by registered or certified mail to the last business address known to the one who gives the notice; or transmitted by fax machine, with a receipt retained to prove delivery. Notice is deemed effective when given rather than when received.
- 27.2 Supplemental General and Special Conditions When the Work contemplated by the Owner is of such a character that these Uniform General Conditions of the Contract cannot adequately cover necessary and additional contractual relationships, the Contract may include Supplemental General and Special Conditions as described below:
- 27.2.1 Supplemental General Conditions may describe the standard procedures and requirements of contract administration followed by a contracting agency of the State. Supplemental General Conditions may expand upon matters covered by the Uniform General Conditions, where necessary, provided the expansion does not weaken the character or intent of the Uniform General Conditions. Supplemental General Conditions are of such a character that it is anticipated that a contracting agency of the State will normally use the same, or similar, conditions to supplement each of its several projects.
- 27.2.2 Special Conditions shall relate to a particular project and are peculiar to that project but shall not weaken the character or intent of the Uniform General Conditions.
- 27.3 Federally Funded Projects. If this project is federally funded, the Special Conditions will indicate that fact and will contain any modifications of these Uniform General Conditions required as a condition of obtaining federal funding.
- 27.4 Computation of Time. Other than in reference to the Notice to Proceed letter, in computing any time period set forth in this Contract, the first day of the period shall not be included, but the last day shall be.
- 27.5 Survival of Obligations. All representations, indemnifications, warranties and guarantees made in accordance with the Contract Documents will survive final payment, completion and acceptance of the Work, as well as termination for any reason. All duties imposed upon the Contractor by reason of termination, including

without limitation, the duty to assign subcontracts and contracts with vendors and suppliers, shall likewise survive the termination of the Contract.

- 27.6 No Waiver of Performance. The failure of either party in any instance to insist on the performance of any of the terms, covenants or conditions of the Contract Documents, or to exercise any of the rights granted thereunder, shall not be construed as waiver of any such term, covenant, condition or right with respect to further performance.
- 27.7 Governing Law. This Contract shall be governed by the laws of the State of Texas.
- 27.8 Captions and Catchlines. The captions and catchlines used throughout the Uniform General Conditions are for ease of reference only and have no effect on the meaning of the terms and conditions set forth herein.
- 27.9 Independent Contractor Status. The Contract Documents create an independent contractor relationship between the Owner and the Contractor and neither party's employees or contractors shall be considered employees, contractors, partners or agents of the other party.
- 27.10 No Third Party Beneficiaries. The parties to this Contract do not intend, nor shall any clause be interpreted to create in any third party, any obligations to, or right of benefit by, such third party under these Contract Documents from either the Owner or the Contractor.
- 27.11 Entire Agreement. These Contract Documents supercede, in full, all prior discussions and agreements (oral and written) between the parties relating to the subject matter hereof and constitutes the entire agreement.
- 27.12 Assignment. This Contract may not be assigned by either party without the prior written consent of the other, except either party may, upon Notice to the other party but without the other party's consent, assign this Contract to a present or future affiliate or successor, provided that any such assignment by the Contractor shall be contingent on the Owner's determination that the assignee is qualified to perform the Work, is in good standing with the State of Texas and otherwise eligible to so business with the State of Texas.
- 27.13 Severability. If any provision, sentence, clause or article of this Contract is found to be invalid or unenforceable for any reason, the remaining provisions shall continue in effect as if the invalid or unenforceable provision were not in the Contract. All provisions, sentences, clauses and articles of this Contract are severable for this purpose.
- 27.14 Parties Bound. Execution of this Contract by each party binds the entity represented as well as its employees, agents, successors and assigns to its faithful performance.

27.15 No Waiver of Sovereign Immunity. Nothing herein shall be construed as a waiver of the State's sovereign immunity.

SUPPLEMENTARY UNIFORM GENERAL CONDITIONS

NOTICE

The following **Supplements** modify, change, delete from or add to the “Uniform General Conditions”. Where any Article of the UGC is modified or any paragraph or clause thereof is modified or deleted by these supplements, the unaltered condition of the Article, paragraph, subparagraph or clause shall remain in effect. These conditions, as well as the technical provisions for the Work to be executed and the Specifications bound herein, shall be subject to all of the requirements and are complementary to the provisions of the Instructions for Proposal and the Uniform General Conditions, and shall be used in conjunction with them as a part of the Contract Documents.

ARTICLE I. General Contract Definitions

1.20 The Owner is defined as Texas A&M University Kingsville.

1.21 The Official address for the University is:

U.S. Mail

Texas A&M University-Kingsville
700 University Blvd
MSC 212
Kingsville, TX 78363

Commercial Carrier

Texas A&M University-Kingsville
955 University Blvd
Room 121 College Hall
Kingsville, TX 78363

1.22 U.S. Mail The address for the Project Manager is:

U.S. Mail

Texas A&M University-Kingsville
Division of Support Services
700 University Blvd
MSC 111
Kingsville, TX 78363

Commercial Carrier

Texas A&M University-Kingsville
Division of Support Services
1010 North Retama
Kingsville, TX 78363

ARTICLE IV. Drawings and Specifications

4.2 Copies Furnished: The Contractor will be furnished up to two (2) complete sets of Plans and Specifications at no cost. If additional sets are available, they will also be furnished free of charge. If unavailable, additional sets will be furnished at actual cost of reproduction and costs will be borne by the Contractor.

ARTICLE VII. General Responsibilities of the Owner and the Contractor

7.5.14 The Contractor shall make arrangements with the Owner for access and storage provisions at the site, and the areas around the building at which he shall confine his activities and shall in no way obstruct another part of the campus that will affect the owner's necessary operations. If needed the Owner representative shall identify the area outside the building for this work.

7.5.15 The Contractor shall exercise care to protect and preserve all existing utilities, either concealed or exposed, here scheduled to remain. Where existing electrical and/or mechanical service lines are required to be moved, altered, or connected to, the work shall be scheduled to avoid interference with the Owner's usage of the facility during construction, and to avoid any untimely and extended interruption of the services. A tentative working schedule shall be approved by the Owner representative prior to any work being started that will cause an interruption of service.

7.5.16 The Contractor shall take extra care to protect existing trees, shrubs, and lawn outside and inside of the work area that is not scheduled for removal. If necessary, protective barricades shall be constructed around trees and shrubs for their protection by the Contractor. If pruning of any existing tree or shrubs are required, the contractor must contact the Owner's representative for written permission and directions on how to trim the trees.

7.5.17 The Contractor shall insure all employees to include those associated subcontractors are persons of good character and shall insure that all behave in a manner consistent with recognized adult behavior while working on this Project. In addition, the Contractor shall instruct and/or convey to all such employees that if any display of bad manners or sloppy dress deemed objectionable to University staff, faculty, or students occurs on campus, then that employee will be directed to leave the campus and will not be allowed back on the job site. The Contractor's superintendent shall strictly enforce this requirement.

7.5.18 The Contractor must supply the Owner with Material Safety Data sheets (MSDSs) for all new material being installed in a public building. This requirement includes but is not limited to the following items: floor coverings, floor covering glues, wall coverings, joint compound, sealants, and caulking material. The contractor may not install materials or replacement parts in a public building if a required material safety data sheet has not been obtained, or if the materials or parts, according to the material safety data sheet, contain more than one percent asbestos, and there is an alternative material or part.

ARTICLE XIII. Contract Payments

- 13.1 Modify paragraph 13.1. "Prior to the first pay request the Contractor shall provide a one-time breakdown of the original contract sum into the required asset categories. Each line item on the breakdown shall be coded with one of the category codes which are outlined as follows:

TEXAS A&M UNIVERSITY SYSTEM
GUIDELINES FOR PROJECT PRICE BREAKDOWN

<u>CODE</u>	<u>CATEGORY</u>
001.0	General Condition Items
002.0	Demolition
003.0	Asbestos Abatement
821018	Parking Lots & Driveways
821425	Paved Area - Non Parking
825035	Sidewalks & Paved Walk Areas
825003	Streets or Roads - (includes curbs & gutters)
825021	Electrical Distribution (Site) - (includes elec. lines, equipment & site lighting)
825025	Telephone Distribution - (includes site lines other than fiber optic phone lines)
825024	Fiber Optics - (all site fiber optic lines including fiber optic phone lines)
825022	Natural Gas Lines (Site)
825023	Water Distribution (Site) - (includes heated & chilled water & steam lines)
825013	Sanitary & Storm Sewers (Site)
821213	Fences (other than temporary)
821417	Landscaping
821414	Irrigation System
821418	Retaining Walls & Mow Strips
824125	Improvements - General (Site) - (includes benches, monuments, statues, markers)
825026	Tunnels

Plus the following 11 component categories for EACH building

811011	Building Shell
811023	Roof Coverings
811022	Elevator System
811024	Floor Coverings
811014	Interior Finishes
811020	HVAC System
811015	Plumbing System
811021	Electrical and Lighting System
811018	Fire Protection System
811025	Fixed Equipment Assets
811030	Miscellaneous Construction Features

Exhibit 27a

Code Componentization Descriptions:

- 811011** Building shell: the exterior walls, excavation within the building footprint, foundation, floors, and roof structural system and decking of a building. The walls consist of the wall layers starting with the exterior building skin and ending at the inner thermal layer. The suggested useful life of a building shell is 30 years.
- 811023** Roof Coverings: includes the covering material used to establish the water barrier on the building's roof deck. The roof covering starts with the first membrane above the roof decking materials including the urethane layer, coating, shingles,

films, metal panels, clay tiles and all material installed above the roof deck; The recommended useful life of clay tile is 30 years. The recommended useful life of a metal panel roof is 20 years and a urethane roof or shingle roof is 15 years. The recommended useful life of all other roof types is 15 years.

- 811022** Elevator system: comprised of the elevator and escalator conveyance systems including controls; The recommended useful life of this system is 20 years.
- 811024** Floor Coverings: includes carpet, ceramic tile, stone, terrazzo, vinyl tile, wood, laminate and linoleum floor coverings, and other types of floor coverings and all padding and barrier sheeting installed above the concrete slab or wooden deck; The recommended useful life of ceramic tile, stone and terrazzo is 30 years. All other floor types should have a useful life of 15 years.
- 811014** Interior finish: all walls, partitions, ceilings and millwork that are inside the building shell walls. This will include but not limited to, all framework, interior doors, interior windows, sheet rock, paneling, paint and any other wall and ceiling coverings; The recommended useful life is 15 years.
- 811020** HVAC: includes the chillers, condensers, exhaust fans and coil units, heating strips, chilled/heating water supply and return piping, air ducts, registers, climate control panels and all circuitry connected to the power supply panel. The recommended useful life of this equipment is 15 years.
- 811015** Plumbing system: all piping, drains, fixtures, and associated equipment within the perimeter of the building used for moving domestic water, other fluid gases, compressed air or sewage: The recommended useful life of this system is 20 years.
- 811021** Electrical and lighting systems: all telecommunication and alarm wiring, lighting fixtures, electrical conduit, wire, cables, circuits, switches, and controls within the perimeter of the building that provide power for all electrical apparatuses and lighting instruments. The recommended useful life of this system is 20 years.
- 811018** Fire protection system: comprised of the piping, sprinkler heads and controls (Circuitry for fire detection, alarms, and warning devices are included in 'Electrical'.);
- 811025** Fixed equipment assets: is any equipment other than equipment comprised of the HVAC system, electrical system, fire protection system, plumbing system or elevator system that is installed and permanently attached to some part of the building's structure;
- 811030** Miscellaneous construction features: any building component that does not fit into one of the other ten categories;

The initial contract breakdown may require some revisions by the Contractor after the Owner's review. It is, therefore, recommended that this breakdown be prepared and submitted as soon as possible to avoid delay of the initial payment to the contractor."

ARTICLE XVIII. Good Faith Effort Subcontracting Program (HUBs)

18.4 Refer to the next attached four (4) pages that provide the instructions and forms for the HUB Subcontracting Plan (HSP). The potential subcontracting opportunities for this project are listed in Article XVIII, Special Conditions. The forms can be downloaded from the following website: <http://www.window.state.tx.us/procurement/prog/hub/hub-subcontracting-plan/>

ARTICLE XXIII. Time Allotted for Performance, Construction Schedule

23.2 The Contractor shall submit the proposed work progress schedule within 14 days of the Notice to Proceed.



HUB SUBCONTRACTING PLAN (HSP)

In accordance with Gov't Code §2161.252, the contracting agency has determined that subcontracting opportunities are probable under this contract. Therefore, respondents, including State of Texas certified Historically Underutilized Businesses (HUBs), must complete and submit a State of Texas HUB Subcontracting Plan (HSP) with their solicitation response.

NOTE: Responses that do not include a completed HSP shall be rejected pursuant to Gov't Code §2161.252(b).

The HUB Program promotes equal business opportunities for economically disadvantaged persons to contract with the State of Texas in accordance with the goals specified in the State of Texas Disparity Study. The HUB goals defined in 1 TAC §111.13 are: *11.9 percent for heavy construction other than building contracts, 26.1 percent for all building construction, including general contractors and operative builders contracts, 57.2 percent for all special trade construction contracts, 20 percent for professional services contracts, 33 percent for all other services contracts, and 12.6 percent for commodities contracts.*

- - Agency Special Instructions/Additional Requirements - -

REFER TO SPECIAL CONDITIONS ARTICLE XVIII, GOOD FAITH EFFORT SUBCONTRACTING PROGRAMS (HUBS) TO DETERMINE IF AN HSP IS REQUIRED AND FOR A MINIMUM LIST OF SUBCONTRACTING OPPORTUNITIES IDENTIFIED BY THE OWNER.

SECTION 1 - RESPONDENT AND SOLICITATION INFORMATION

- a. Respondent (Company) Name: _____ State of Texas VID #: _____
 Point of Contact: _____ Phone #: _____
- b. Is your company a State of Texas certified HUB? - Yes - No
- c. Solicitation #: _____

SECTION 2 - SUBCONTRACTING INTENTIONS

After having divided the contract work into reasonable lots or portions to the extent consistent with prudent industry practices, the respondent must determine what portion(s) of work, including goods or services, will be subcontracted. Note: In accordance with 1 TAC §111.12., a "Subcontractor" means a person who contracts with a vendor to work, to supply commodities, or contribute toward completing work for a governmental entity. Check the appropriate box that identifies your subcontracting intentions:

- Yes, I will be subcontracting portion(s) of the contract.
 (If Yes, in the spaces provided below, list the portions of work you will be subcontracting, and go to page 2.)
- No, I will not be subcontracting any portion of the contract, and will be fulfilling the entire contract with my own resources.
 (If No, complete SECTION 9 and 10.)

Line Item # - Subcontracting Opportunity Description	Line Item # - Subcontracting Opportunity Description
(#1) -	(#9) -
(#2) -	(#10) -
(#3) -	(#11) -
(#4) -	(#12) -
(#5) -	(#13) -
(#6) -	(#14) -
(#7) -	(#15) -
(#8) -	(#16) -

*If you have more than twenty subcontracting opportunities, a continuation page is available at <http://www.window.state.tx.us/procurement/prog/hub/hub-subcontracting-plan/>

Enter your company's name here: _____ Solicitation #: _____

IMPORTANT: You must complete a copy of this page for each of the subcontracting opportunities you listed in SECTION 2. You may photocopy this page or download copies at <http://www.tbpc.state.tx.us.hubforms/index.html>.

SECTION 3 - SUBCONTRACTING OPPORTUNITY

Enter the line item number and description of the subcontracting opportunity you listed in SECTION 2.

Line Item # _____ Description: _____

SECTION 4 - MENTOR-PROTÉGÉ PROGRAM

If respondent is participating as a Mentor in a State of Texas Mentor Protégé Program, submitting their Protégé (Protégé must be a State of Texas certified HUB) as a subcontractor to perform the portion of work (subcontracting opportunity) listed in SECTION 3, constitutes a good faith effort towards that specific portion of work. Will you be subcontracting the portion of work listed in SECTION 3 to your Protégé?

- Yes (If Yes, complete SECTION 8 and 10.) - No / Not Applicable (If No or Not Applicable, go to SECTION 5.)

SECTION 5 - PROFESSIONAL SERVICES CONTRACTS ONLY

This section applies to Professional Services Contracts only. All other contracts go to SECTION 6.

Does your HSP contain subcontracting of 20% or more with HUB(s)?

- Yes (If Yes, complete SECTION 8 and 10.) - No / Not Applicable (If No or Not Applicable, go to SECTION 6.)

In accordance with Gov't Code §2254.004, "Professional Services" means services: (A) within the scope of the practice, as defined by state law of accounting; architecture; landscape architecture; land surveying; medicine; optometry; professional engineering; real estate appraising; or professional nursing; or (B) provided in connection with the professional employment or practice of a person who is licensed or registered as a certified public accountant; an architect; a landscape architect; a land surveyor; a physician, including a surgeon; an optometrist; a professional engineer; a state certified or state licensed real estate appraiser; or a registered nurse.

SECTION 6 - NOTIFICATION OF SUBCONTRACTING OPPORTUNITY

Complying with a, b and c of this section constitutes Good Faith Effort towards the portion of work listed in SECTION 3. After performing the requirements of this section, complete SECTION 7, 8 and 10.

- a. Provide written notification of the subcontracting opportunity listed in SECTION 3 to **three (3)** or more HUBs. Use the State of Texas' Centralized Master Bidders List (CMBL), found at <http://www.window.state.tx.us/procurement/cmb/cmbhub.html> and its HUB Directory, found at <http://www.window.state.tx.us/procurement/cmb/hubonly.html>, to identify available HUBs. **Note: Attach supporting documentation (letters, phone logs, fax transmittals, electronic mail, etc.) demonstrating evidence of the good faith effort performed.**
- b. Provide written notification of the subcontracting opportunity listed in SECTION 3 to a minority or women trade organization or development center to assist in identifying potential HUBs by disseminating the subcontracting opportunity to their members/participants. A list of trade organizations and development centers may be accessed at <http://www.tbpc.state.tx.us/hub/minoritywomenbuslinks.htm>. **Note: Attach supporting documentation (letters, phone logs, fax transmittals, electronic mail, etc.) demonstrating evidence of the good faith effort performed.**
- c. Written notifications should include the scope of the work, information regarding the location to review plans and specifications, bonding and insurance requirements, required qualifications, and identify a contact person. Unless the contracting agency has specified a different time period, you must allow the HUBs no less than **five (5) working days** from their receipt of notice to respond, **and** provide notice of your subcontracting opportunity to a minority or women trade organization or development center no less than **five (5) working days** prior to the submission of your response to the contracting agency.

SECTION 7 - HUB FIRMS CONTACTED FOR SUBCONTRACTING OPPORTUNITY

List **three (3)** State of Texas certified HUBs you notified regarding the portion of work (subcontracting opportunity) listed in SECTION 3. Specify the vendor ID number, date you provided notice, and if you received a response. **Note: Attach supporting documentation (letters, phone logs, fax transmittals, electronic mail, etc.) demonstrating evidence of the good faith effort performed.**

Company Name	VID #	Notice Date (mm/dd/yyyy)	Was Response Received?
_____	_____	____/____/____	<input type="checkbox"/> - Yes <input type="checkbox"/> - No
_____	_____	____/____/____	<input type="checkbox"/> - Yes <input type="checkbox"/> - No
_____	_____	____/____/____	<input type="checkbox"/> - Yes <input type="checkbox"/> - No

SECTION 8 - SUBCONTRACTOR SELECTION

List the subcontractor(s) you selected to perform the portion of work (subcontracting opportunity) listed in SECTION 3. Also, specify the expected percentage of work to be subcontracted, the approximate dollar value of the work to be subcontracted, and indicate if the company is a Texas certified HUB.

Company Name	VID #	Expected % of Contract	Approximate Dollar Amount	Texas Certified HUB?
_____	_____	____%	____\$	<input type="checkbox"/> - Yes <input type="checkbox"/> - No*
_____	_____	____%	____\$	<input type="checkbox"/> - Yes <input type="checkbox"/> - No*

*If the subcontractor(s) you selected is not a Texas certified HUB, provide written justification of your selection process below:

Enter your company's name here: _____

Solicitation #: _____

SECTION 9 - SELF PERFORMANCE JUSTIFICATION

(If you responded "No" to SECTION 2, you must complete SECTION 9 and 10.)

Does your response/proposal contain an explanation demonstrating how your company will fulfill the entire contract with its own resources?

- **Yes** If Yes, in the space provided below, list the specific page/section of your proposal which identifies how your company will perform the entire contract with its own equipment, supplies, materials and/or employees.

- **No** If No, in the space provided below, explain how your company will perform the entire contract with its own equipment, supplies, materials, and/or employees.

SECTION 10 - AFFIRMATION

As evidenced by my signature below, I affirm that I am an authorized representative of the respondent listed in SECTION 1, and that the information and supporting documentation submitted with the HSP are true and correct. Respondent understands and agrees that, if awarded any portion of the solicitation:

- The respondent must submit monthly compliance reports (Prime Contractor Progress Assessment Report – PAR) to the contracting agency, verifying their compliance with the HSP, including the use/expenditures they have made to subcontractors. (The PAR is available at <http://www.tceq.state.tx.us/assets/public/admin/hub/10318.pdf>).
- The respondent must seek approval from the contracting agency prior to making any modifications to their HSP. If the HSP is modified without the contracting agency's prior approval, respondent may be subject to debarment pursuant to Gov't Code §2161.253(d).
- The respondent must, upon request, allow the contracting agency to perform on-site reviews of the company's headquarters and/or work-site where services are to be performed and must provide documents regarding staff and other resources.

 Signature Printed Name Title Date



HUB Subcontracting Plan (HSP) Prime Contractor Progress Assessment Report

This form must be completed and submitted to the contracting agency each month to document compliance with your HSP.

Contract/Requisition Number: _____ Date of Award: _____ Object Code: _____
(mm/dd/yyyy) (Agency Use Only)

Contracting Agency/University Name: _____

Contractor (Company) Name: _____ State of Texas VID #: _____

Point of Contact: _____ Phone #: _____

Reporting Period: [] - Jan. [] - Feb. [] - Mar. [] - Apr. [] - May [] - Jun. [] - Jul. [] - Aug. [] - Sept. [] - Oct. [] - Nov. [] - Dec.
(Check only one Month)

Total Contract Amount Paid this Reporting Period to Contractor: \$ _____

Report HUB and Non-HUB subcontractor information

Table with 6 columns: Subcontractor's Name, Subcontractor's VID or HUB Certificate Number, Total Contract \$ Amount from HSP with Subcontractor, Total \$ Amount Paid This Period to Subcontractor, Total Contract \$ Amount Paid to Date to Subcontractor, Object Code (agency use only). Includes a TOTALS row at the bottom.

Signature: _____ Title: _____ Date: _____

SPECIAL CONDITIONS

NOTICE

The following Special Conditions modify, change, delete from or add to the “Uniform General Conditions (UGC)” and/or the “Supplementary Uniform General Conditions (SUGC)”. Where any Article of the UGC or SUGC is modified or any paragraph or clause thereof is modified or deleted by these special conditions, the unaltered condition of the Article, paragraph, subparagraph or clause shall remain in effect. These conditions, as well as the technical provisions for the Work to be executed and the Specifications bound herein, shall be subject to all of the requirements and are complementary to the provisions of the Instruction for Proposal, UGC, and SUGC, shall be used in conjunction with them as part of the Contract Documents.

ARTICLE I. General Definitions

1.21. The Owner’s designated representative is Micheal R. Foor, P.E., University Engineer. This also modifies UGC, Article VII, 7.1.3.

ARTICLE V. Construction Bonds

5.1.1. A Performance Bond is required for this project.

5.1.2. A Payment Bond is required for this project.

ARTICLE VI. Insurance Requirements

6.1.2.g. Flood Insurance is not required for this project.

6.1.2.h. Umbrella Coverage: \$1,000,000 umbrella coverage required.

6.3. The Contractor shall furnish the Owner with a satisfactory Certificate of Insurance as proof of carriage of the insurance required. The Certificate must be submitted prior the Owner signing the Contract. Any changes in the coverage shall be reported with ten (10) days on a revised Certificate that must be provided to the Owner’s representative.

ARTICLE VII. General Responsibilities of the Owner and the Contractor

7.1.8 The Owner will furnish water and electricity during construction, if available, at no cost to the Contractor. The Contractor shall provide all temporary means of conveying this water and electricity and bear all costs to bring water and electricity to places on the site where it is required by the operation during construction

7.1.9 The Owner Representative will provide to the Contractor one set of keys for the electric panel boxes and building entrances upon receipt of a security deposit, \$50.00 per key. The keys must be returned to the Owner’s representative at the end of the project. Once done, the

Owner's representative will return the deposit.

- 7.5.18 The Contractor shall limit parking of vehicles to areas designated on the Plans or by the Owner's representative. Parking on grassy areas is not normally allowed. The contractor will be responsible for the cost of repairing any damages caused by Contractor's vehicles to grassed areas, sidewalks, fences, etc. during the course of construction work. All parking lots, except for those areas specifically directed in the Plans, shall remain open to the public at all times, except when written permission is received from the Owner's representative. Request for a variance shall be submitted in writing at least 48 hours prior to anticipated need. Regulations concerning parking and traffic on campus have been established and administered by the University Police Department (located in Seale Hall on the southeast side of the campus). Contact the UPD, 361-593-2611, for questions concerning these regulations.
- 7.5.19 The Contractor shall set up his own temporary office in a space designated by the Owner representative. This may be within a specified building. The Contractor has responsibility for securing all items left within this specified space.
- 7.5.20 The Contractor shall use cellular phone service or pay phones on the construction site. Owner telephones will not be available to the contractor.
- 7.5.21 The Contractor shall obtain an Underground Utility Work Permit (Digging Permit) from the TAMUK University Engineer Office in Room 107, Support Services Building at 1010 Retama Street, 361-593-2645, prior to any excavation, trenching, or boring work required for the project. This Digging Permit will identify underground utilities in the location of the project site. The blank form to request the Digging Permit can be obtained from the Owner's representative.

ARTICLE IX. The Contractor's Responsibility for Jobsite Safety

- 9.4.2 The Contractor shall maintain a means of exit and egress of the building throughout the duration of the construction work. The work must be scheduled in a manner to minimize conflicts with the Owner's use of the facility and shall coordinate any specific space needs with the Owner's representative. Electrical service and other utility services to the building shall not be interrupted without 48 hours advance notice to the Owner's representative.
- 9.4.3 The Contractor shall erect and maintain temporary partitions as required to keep construction dust and debris from filtering out into mechanical systems or into other areas used by the Owner's employees and/or students. In addition the Contractor will pay for the cost of changing the air handler filters every thirty (30) days, or more often if dust accumulation has exceeded filter capacity.

ARTICLE X. Materials and Workmanship; Licensing and Testing

- 10.6. Material and Equipment deliveries shall be made directly to the construction site or construction office. All deliveries must be made to the designated contractor representative and not the University.
- 10.7. The Contractor shall not sell or give to any non-employee any demolished or salvaged material from this site, while the material is still on the Texas A&M University campus. Once any demolished/remove material (not scheduled for delivery to owner) is off the campus, then the Contractor may either sell or dispose of it properly.
- 10.8. Private disposal services must be used for trash and debris removal. A dumpster or other type of container may be located outside the building on a location approved by the Owner's representative. The Contractor shall not use any dumpsters located on the University campus for disposal of any debris or material generated from the work of this project. Approval for disposal of trash and debris may be arranged with the City of Kingsville.
- 10.9 The Contractor shall provide an acceptable means of security to protect all existing equipment and property on and around the construction site, and also to protect his work from unauthorized access. All questions regarding campus security shall be referred to the University Police Department.

ARTICLE XI. Shop Drawings and Submittals

- 11.2 Nature and Effect of Review. The A/E, in consultation with owner, will review and approve all submittals with reasonable promptness and return to the Contractor within seven days after having received the submittal. Comments and/or approval will be indicated in writing.

ARTICLE XII. Inspection of the Project During Construction

- 12.2.4 A building permit is not required for this construction project.

ARTICLE XIV. Closing Inspection

- 14.2 Final Inspection. The Contractor shall make a good effort to complete all work on the pre-final punch list within 14 days of the date of Substantial Completion.

ARTICLE XVI. Contract Final Acceptance and Payment

- 16.1.1. Products and Maintenance Manuals (3 copies) are required for this project. Each copy will be in a three ring binder and must include the following information:
- a. Manufacturer catalog description of all products or equipment that will require periodic adjustment, cleaning, or maintenance.

- b. Manufacturer's literature and recommendation for cleaning, maintenance, and adjustment schedule.
- c. Manufacturer model number, and/or serial number of the actual item furnished or installed as part of this project.

ARTICLE XVIII. Good Faith Effort Subcontracting Program (HUBs)

18.9. The Owner has determined that subcontracting opportunities are probable under this contract; therefore a Historically Underutilized Business Subcontractor Plan (HSP) is required as detailed in Article XVIII, Supplementary Uniform General Conditions.

Texas A&M University-Kingsville has identified the following potential subcontracting opportunities for this contract. Bidders should consider this a minimum in formulating their HSP and may add other subcontracting opportunities deemed necessary to complete the contract.

- | | |
|----------------------------------|---|
| 1. Commodity Code: <u>340-24</u> | Description: <u>Fire Escapes and Fire Exit Devices</u> |
| 2. Commodity Code: <u>340-80</u> | Description: <u>Smoke detecting equip. inc smk alarms</u> |
| 3. Commodity Code: <u>910-14</u> | Description: <u>Door Installation</u> |
| 4. Commodity Code: <u>910-25</u> | Description: <u>Flooring Repair</u> |
| 5. Commodity Code: <u>910-54</u> | Description: <u>Painting</u> |
| 6. Commodity Code: <u>910-75</u> | Description: <u>Drywall</u> |
| 7. Commodity Code: <u>910-82</u> | Description: <u>Electrical Services, controls</u> |
| 8. Commodity Code: <u>910-38</u> | Description: <u>Electrical Services, construction</u> |
| 9. Commodity Code: <u>910-47</u> | Description: <u>Glass, Glazing Services, constr</u> |

18.9 This contract does require a Historically Underutilized Business Plan (HSP).

ARTICLE XXIII. Time Allotted for Performance; Construction Schedule

23.1 Contract Time. The work to be performed under this contract shall be completed in **30** consecutive calendar days plus any extended days approved by the Owner's representative in accordance with the Uniformed General Conditions and Supplementary General Conditions. Generally most of the work shall be scheduled during weekdays, between the hours of 8 AM and 5 PM, Monday thru Friday. Work is encouraged during weekends.

23.3 Work Progress Meetings. The contractor’s project manager or project superintendent shall preside over the meeting, prepare agenda, record minutes, and distribute copies within four working days after meeting to participants. The following persons will be expected to attend the meetings: Owner’s representative, Architect/Engineer construction administrator, A/E’s consultants for mechanical, electrical, and structural, contractor’s general superintendent, project superintendent, and project manager, subcontractors who have work in progress, and subcontractors who will start work within the next month. The contractor will provide a written agenda that includes a brief description of construction progress since the last meeting, review of the construction schedule with explanation of existing or anticipated delays or problems, if any, review the submittal schedule/log, review of request for information, review of project documents, review and approval of the progress payment, and general discussion of other outstanding/current business. A minimum of one progress meeting shall be held each month.

23.4 Rainfall Table for Texas A&M University-Kingsville.

January.....3 Days	July.....3 Days
February.....3 Days	August.....3 Days
March.....2 Days	September.....6 Days
April.....2 Days	October.....3 Days
May.....4 Days	November.....3 Days
June.....4 Days	December.....3 Days

ARTICLE XXIV. Modification of the Contract Time

24.3.1. The Contractor shall pay the sum of One Hundred Dollars (\$100.00) in the form of liquidated damages for each consecutive calendar day that the work remains incomplete following the date of completion as amended by approved extensions.

Under Texas Family Code, section 14.52, a sole proprietorship, partnership, corporation, or other entity in which a sole proprietor, partner, a majority shareholder of a corporation or an owner of 10% or more of another business entity is 30 days or more delinquent in paying child support under a court order or a written repayment agreement is not eligible to bid on or receive a state contract. To comply with section 14.52, the affidavit below must be signed by the person who is authorized to sign and submit a bid on behalf of a business entity that is subject to section 14. 52, and thereby bind the bidder. The affidavit must be returned with the bid. **ANY CORPORATION, INCLUDING A NON-PROFIT CORPORATION, THAT DOES NOT HAVE A MAJORITY SHAREHOLDER WHO IS A NATURAL PERSON CAPABLE OR BEING A CHILD SUPPORT OBLIGOR, AND GOVERNMENTAL ENTITIES ARE NOT SUBJECT TO SECTION 14.52 OF THE TEXAS FAMILY CODE. IF A BIDDER IS SUCH A CORPORATION, PLEASE CHECK BELOW**

Corporation without Natural Person-Majority Shareholder

AFFIDAVIT

FAILURE OF AN ENTITY SUBJECT TO SECTION 14.52 OF THE TEXAS FAMILY CODE TO SIGN AND RETURN THIS AFFIDAVIT WITH THIS BID WILL RESULT IN THE DISQUALIFICATION OF THE BID.

I, _____ am authorized to sign this bid on behalf of _____,
(Name and Title) (Name of bidder)
a _____,
(type of business: i.e. sole proprietorship, partnership, corporation, or other)

I certify that no _____
(sole proprietor for proprietorship or, partner for a partnership, or majority shareholder for a corporation, or 10% or more owner for other entity)
is 30 days or more delinquent in child support payments by order or written repayment agreement.

SIGNATURE

DATE

SWORN AND SUBSCRIBED to before me the undersigned notary on
_____, 20____

NOTARY SIGNATURE

(SEAL)

IF AFFIDAVIT IS REPRODUCED OR FAXED, THE NOTARY SEAL MUST BE LEGIBLE TO BE CONSIDERED.



TEXAS A&M UNIVERSITY SYSTEM
200 Technology Way, Suite 1162
College Station, Texas 77845-3424

Fiscal Year: 2008-2009
County: Kleburg

CLASSIFICATION	RATE	NOTES
Acoustic Ceiling Installer	11.04	
Asbestos Abatement Worker	9.49	
Carpenter	11.07	
Concrete – Pour and Finish	12.02	
Drywall Installer	8.88	
Electrician – Journeyman	16.36	
Electrician – Apprentice	9.55	
Elevator Mechanic – Journeyman	23.13	
Elevator Mechanic – Apprentice	14.89	
Fire Protection – Journeyman	13.86	
Fire Protection – Apprentice	9.82	
Formbuilder	9.81	
Glazier	14.72	
HVAC – Journeyman	17.88	
HVAC – Apprentice	10.61	
HVAC – Controls Installer	13.90	
Insulator – Building	10.91	
Insulator – MEP	9.49	
Ironworker	13.12	
Laborer	8.53	
Mason	15.09	
Equipment Operator – Light	12.00	
Equipment Operator – Heavy	13.20	
Painter	10.10	
Plasterer	10.30	
Plumber – Journeyman	19.39	
Plumber – Apprentice	11.17	
Reinforcing Steel Worker	8.53	
Roofer	10.02	
Stone Mason	14.79	
Waterproofer	10.38	
Welder		Receive rate prescribed for craft performing operation to which welding is incidental.

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

A. SECTION INCLUDES:

1. Work covered by Contract Documents.
2. Contract Method.
3. Starting Work.
4. Work by Others.
5. Contractor's Use of Premises.
6. Owner Occupancy.
7. Partial Owner Occupancy.

B. WORK COVERED BY CONTRACT DOCUMENTS:

1. The Work of this Contract comprises the construction of Memorial Student Union Building – One Stop Shop, Phase II located on the A&M University-Kingsville campus for the Board of Regents of the Texas A&M University System.
2. The Drawings and Specifications do not necessarily indicate or described all Work required for completion of Project.
3. The Contract Documents describe the essential elements sufficiently to determine the scope of the Project.
4. Provide all items required for complete operating systems including items not necessarily shown in these Contract Documents, but that can be reasonably inferred as being required for a complete operating system.
5. The Drawings and Specifications indicate the basic quality of material and quality of construction required for the entire Project.

C. CONTRACT METHOD:

1. Construct the Work under a single lump sum contract.

D. STARTING WORK:

The Texas A&M University System has no objection to the Contractor beginning work prior to receipt of a Notice to Proceed letter provided:

1. The Contractor has furnished to the Manager, Facilities Construction Division, the required Insurance Certificates (ref: TAMUS General Conditions, Article V, para. 5.7).
2. The Contractor understands that Work undertaken prior to the Notice to Proceed is at its own risk and that the Owners Representative must be notified prior to commencing Work.

E. WORK BY OTHERS:

1. Contractor shall cooperate and coordinate its Work with Work provided under other contracts. Separate Contracts will include, but not necessarily be limited to the following:
 - a. Asbestos and Lead Paint Removal.
 - b. Owner's Testing Laboratory Services (Quality Control).
 - c. Owners' independent HVAC balancing, testing and adjusting.
 - d. N.I.C. (Not In Contract) Work.

F. CONTRACTOR'S USE OF PREMISES:

1. Contractor shall have complete and exclusive use of premises within the construction limits indicated on the Drawings, for execution of Work.
 - a. Where it is necessary for the Contractor to use portions of existing buildings and/or grounds for operations, such use shall be strictly in accordance with requirements and approval of the Owner. Contractor shall provide proper and safe access to the Owner occupied areas at all times.
 - b. All interruption of mechanical and electrical underground services shall be only at such time and for lengths of time as approved by Owner. Where modifications to existing facilities are required, Contractor shall organize its work in order that inconvenience to the Owner be minimized. Give minimum 14 day notice to Owner's Representative prior to interruption of services.
 - c. Unless otherwise indicated or specified, or unless otherwise directed by Owner; water, gas, lighting, power and telephone conduits and wires, sewer lines, and other surface and subsurface structures and lines, shall be maintained by Contractor and shall not be disturbed, disconnected or

damaged by him during progress of Work; should Contractor in performance of Work disturb, disconnect or damage any of above, expenses arising from disturbance or in replacing or repair shall be borne by Contractor.

d. Contractor shall coordinate with owner for construction entrances to the project site.

2. Contractor shall:

- a. Not unreasonably encumber site with materials and equipment.
- b. Not load structure with weight that will endanger structure.
- c. Assume full responsibility for protection and safekeeping of stored products.
- d. Move stored products, which interfere with operations of Owner and other contractors.
- e. Obtain and pay for use of additional storage land work areas needed for operations.

3. Upon receipt, by the Contractor, of Notice to Proceed from the Owner, the Owner will make the Project site available to the Contractor to execute the Work under the Contract.

4. Coordinate use of the premises with the Owner's Representative. Contractor must comply with Owner's requirements concerning Contractor's operations and use of the premises, parking, loading and unloading.

G. OWNER OCCUPANCY:

1. Owner will occupy the area surrounding the Project site during the entire period of construction for the conduct of its normal operations. Cooperate with Owner's Representative in all construction operations to minimize conflict, and to facilitate Owner usage.

2. Contractor shall at all times conduct its operations as to ensure the least inconvenience to the general public.

H. PARTIAL OWNER OCCUPANCY:

1. Owner reserves right to use and occupy in whole or any part of the improvements which have been completed sufficiently to permit use and occupancy without delaying Contractor's work. Use and occupancy by Owner shall not, however, be construed as an acceptance of Work of any part, and any claim which Owner may have against Contractor shall not be deemed to have been waived by occupancy. Refer to General Conditions Article I. and IX. for Beneficial Occupancy requirements.

- a. For each partial use and occupancy prior to Beneficial Occupancy, Owner agrees to obtain written consent of Contractor, secure endorsement from insurance carriers, and consent of Surety.
- b. Prior to each use and occupancy, Owner and Contractor shall make mutually acceptable arrangements for security, protection and insurance for people and property; warranties; and operation, maintenance and payment for utilities and services for each such partial use and occupancy.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

- A. It is not the intent of the User to occupy any portion of the building during construction.
- B. It will be the responsibility of the Contractor to provide appropriate temporary partitions, barricades, etc., for the protection and security of the Contractor's operations as the work progresses.

END OF SECTION

SECTION 01020

ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 ALLOWANCES

- A. General: A "Schedule of Allowances," showing amounts included in Contract Sum, is included at end of this section. Coordinate allowance work with related work, to ensure that each selection is completely integrated and interfaced with related work. Requirements for the work of allowances are shown and specified, to extent established by date of Contract Documents; additional requirements are established by change order. Within 30 days after Notice to Proceed advise Architect/Engineer of date each final allowance selection must be completed. Submit proposals for allowance work as directed, and in the manner specified for change orders. Indicate quantities, unit costs, total purchase amounts, taxes, delivery charges and trade discounts. Where requested, furnish detailed breakdown of quantity survey. Contractor mark-up on overrun of allowance purchases will be permitted where purchase amount exceeds established allowance by more than 15%; otherwise, and except as otherwise indicated, amount of change order on each allowance will be difference between purchase amount and allowance. Deliver excess materials of allowance work to Owner's storage space, or dispose of by other means.

SCHEDULE OF ALLOWANCES - SECTION 01020

Allowance No. 1: Door Signage - \$1,000.00.

SECTION 01030

ALTERNATES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED:

- A. Identification and Description of Alternates.

1.02 RELATED REQUIREMENTS:

- A. Related work of other sections:
 - 1. Section 01010 - Summary of Work.
 - 2. Divisions 2 through 16: Sections affected by Alternate.

1.03 PROCEDURES:

- A. Alternates will be exercised at the option of Owner. Alternates accepted by Owner for incorporation into the Work are identified in the Contract.
- B. Coordinate related work and modify surrounding work as required to complete the work, including changes under each Alternate, when acceptance is designated in Contract.
- C. Unit costs are required to be included in bid proposal.

1.04 DESCRIPTION OF ALTERNATES:

Additive Alternate No. 1:

Provide and install carpet tile flooring as specified in Section 09686 and as scheduled below:

Rooms 120, 121, 122, 125, 128, 132, 133, 135, 137, 138, 150, 157: Install carpet over existing VCT. Prepare VCT surface to receive carpet. Existing resilient base, scheduled to remain, is to be replaced with new resilient base. Add painted quarter round trim to existing wood base scheduled to remain.

Rooms 123, 127, 134, 140, 153, 154, 155: Replace existing carpet with new carpet. Prepare surface to receive carpet. Existing resilient base, scheduled to remain, is to be replaced with new resilient base. Add painted quarter round trim to existing wood base scheduled to remain.

Rooms 151, 152, 156 : Replace existing carpet with new carpet in lieu of new VCT. Prepare surface to receive carpet.

Additive Alternate No. 2:

Provide and install FM-200 Fire Suppression System as specified in Section 15365.

Additive Alternate No. 3:

Demolish portion of existing chase wall at fire hose cabinet. Re-route existing fire cabinet plumbing lines if required.

END OF SECTION

SECTION 01045

CUTTING AND PATCHING

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED:

- A. Requirements and limitations for cutting and patching of Work.

1.2 RELATED REQUIREMENTS:

- A. Related Work of Other Sections:

- 1. Section 01010 - Summary of Work.
- 2. Other Technical Sections:
 - a. Cutting and patching required to be performed incidental to Work of the Section.
 - b. Advance notification to trades responsible for Work of other Sections.
 - c. Coordination of trades responsible for Work of other Sections.

1.03 SUBMITTALS:

- A. Submit written request in advance of cutting, drilling, or alteration which affects:

- 1. Work of Owner or any separate Contractor.
- 2. Structural value or integrity of any element of Project.
- 3. Integrity or effectiveness of weather-exposed or moisture-resistant element or systems.
- 4. Efficiency, operational life, maintenance, or safety of Project equipment elements.
- 5. Visual qualities of sight-exposed elements.
- 6. Damage to existing Work or utilities.

- B. Include in request:

- 1. Identification of Project.
- 2. Location and description of affected Work.
- 3. Necessity for cutting, drilling, alteration or excavation.
- 4. Effect on Work of Owner or any separate Contractor, or on structural or weatherproof integrity of Project.
- 5. Description of proposed Work:
 - a. Scope of cutting, patching, alteration or excavation.
 - b. Trades who will perform the Work.

- c. Products proposed to be used.
 - d. Extent of refinishing to be done.
-
- 6. Alternative to cutting, drilling, patching, and excavation.
 - 7. Written permission of separate Contractors whose Work is affected.
 - 8. Date and time Work will be performed.

PART 2 - PRODUCTS

2.1 MATERIALS:

- A. Provide materials and procedures required for original installation.

PART 3 - EXECUTION

3.1 GENERAL:

- A. Field Conditions: Check and verify Contract Documents and field conditions before proceeding with Work. If there are any questions regarding these or other coordination questions, the Contractor is responsible for obtaining clarification from the A/E before proceeding with Work or related Work in question.
- B. Execute cutting, drilling, and patching, including excavation and fill as required to complete the Work and to:
 - 1. Fit the several parts together, to integrate with other Work.
 - 2. Uncover Work to install ill-timed Work.
 - 3. Remove and replace defective and non-conforming Work.
 - 4. Remove samples of installed Work for testing.
 - 5. Provide openings in elements of Work for penetrations of mechanical and electrical work.
 - 6. Uncover Work to allow for A/E's and Owner Representative's observation of Work which has been covered up prior to observation by A/E and Owner.

3.2 INSPECTION:

- A. Inspection: Carefully examine the premises to determine the extent of Work and the condition under which it must be done, including elements subject to movement or damage during cutting and patching, and excavating and backfilling. No extra payments will be allowed for claims for additional Work that could have been determined or anticipated by such inspection. After uncovering Work, inspect conditions affecting installation of new products.
- B. Beginning of cutting, drilling, or patching means acceptance of existing conditions.

3.3 PREPARATION:

- A. Preparation Prior to Cutting: Provide adequate temporary support as necessary to assure structural value or integrity of affected portion of Work. Provide protection from elements for that portion of the Project which may be exposed by cutting and patching Work, and maintain excavations free from water.
- B. Protection: Provide barricades, coverings, fences, supports and similar temporary precautions necessary to protect persons and property from injury or damage as a result of Work of this section. Confine operations to required limits and take reasonable precautions to protect remainder of property from damage.
- C. Dust Control: Control dust resulting from cutting and patching to prevent the spread of dust to adjacent occupied areas and to avoid creation of a nuisance in the adjacent surrounding area. Use of water will be permitted as indicated. Provide drop cloths or other suitable barriers to prevent dust from traveling to adjacent areas. Seal off return air registers or other mechanical systems to prevent dust from entering such systems.

3.4 PERFORMANCE:

- A. Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- B. Employ original installer to perform cutting and patching for weather-exposed, moisture-resistant elements, sight-exposed surfaces, and to preserve Owner's warranties and bonds for Work of this Contract and related Work of other contracts.
- C. Cut rigid materials using masonry saw or core drill. Pneumatic tools are not allowed without prior written approval.
- D. Restore Work which has been cut or removed using new products in accordance with requirements of Contract Documents.
- E. Fit and seal interior Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces. Fit and seal penetrations through exterior Work and slabs for pipes, conduits and other penetrations watertight.
- F. At penetrations of fire-rated wall, ceiling, or floor construction, completely seal voids with fire stopping and sealant material, full thickness of the construction element to provide a smoke seal and penetration rating equivalent to adjacent rated construction. Refer to Section 07270 for requirements.
- G. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit as follows:

1. Walls: From floor to ceiling and between the nearest corner. New gypsum board construction meeting existing construction in same plane shall be flush with no visible joint showing.
 2. Ceiling: The complete surface.
 3. Floor: The complete surface unless otherwise shown or unless a matching patch in applied finishes can be made acceptable to A/E and Owner's Representative.
 4. Openings: The entire unit including frame.
 5. Painted Cabinets: The entire painted surface.
 6. Transparent Finish Cabinets: Finish new surfaces to match existing.
 7. Base: Between the nearest corner.
- H. Damage: Restore accidental or careless damage to Work to remain in place to a condition as good as or better than existing before Work was commenced and at no additional cost to the Owner.

END OF SECTION

SECTION 01090

REFERENCES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED:

- A. Includes requirements for referenced standards, specifications and codes.
- B. Acronyms and source of referenced standards.

1.2 REFERENCE REQUIREMENTS:

- A. Materials, equipment and operations specified by reference to published standards and specifications of a technical, society, trade association, or other agency standard, shall comply with the requirements of the current edition of the listed document that is in effect on the issue date of the Specifications or Addendum page making reference thereto, unless otherwise specified. Make available at site, copies of referenced documents as Owner's Representative or A/E may request.
- B. No provision of a reference standard, specification, manual, or code shall be effective to change the duties and responsibilities of the Owner, the Contractor, the A/E and their consultants, their agents and employees from those duties and responsibilities set forth in the Contract Documents.
- C. Acronyms for names of technical societies, associations, and agencies referenced in the Contract Documents shall be interpreted as follows:

AA	Aluminum Association 900 19TH St., NW, Suite 300 Washington, DC 20006; 202/862-5100
AABC	Associated Air Balance Council 1518 K St., NW, Suite 503 Washington, DC 20005; 202/737-0202
AAMA	Architectural Aluminum Manufacturer's Association 2700 River Rd., Suite 118 Des Plaines, IL 60018; 312/699-7310
AAN	American Association of Nurserymen 1250 Eye St., NW, Suite 500 Washington, DC 20005; 202/789-2900

ACI	American Concrete Institute PO Box 19150 Detroit, MI 48219; 313/532-2600
ACIL	American Council of Independent Laboratories 1725 K Street, NW Washington, DC 20006; 202/887-5872
ADC	Air Diffusion Council 230 N. Michigan Ave., Suite 1200 Chicago, IL 60601; 312/372-9800
AGC	Associated General Contractors of America 1957 E. Street, NW; Washington, DC 20006
AIA	American Institute of Architects 1735 New York Avenue, NW Washington, DC 20006; 202/626-7300
AISC	American Institute of Steel Construction One East Wacker Drive, Suite 3100 Chicago, IL 60601; 312/670-2400
AISI	American Iron and Steel Institute 1133 Fifteenth St., NW Washington, DC 20005; 202/452-7100
AMCA	Air Movement and Control Association 30 W. University Drive Arlington Heights, IL 60004; 312/394-0150
ANSI	American National Standards Institute 1430 Broadway New York, NY 10018; 212/354-3300
APA	American Plywood Association PO Box 11700 Tacoma, WA 98411; 206/565-6600
ARI	Air Conditioning and Refrigeration Institute 1501 Wilson Blvd., 6th Floor Arlington, VA 22209; 703/524-8800

ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers 1791 Tullie Circle, NE Atlanta, GA 30329; 404/636-8400
ASME	American Society of Mechanical Engineers 345 East 47th Street New York, NY 10017; 212/705-7722
ASTM	American Society for Testing and Materials 1916 Race St. Philadelphia, PA 19103; 215/299-5400
AWI	Architectural Woodwork Institute 2310 S. Walter Reed Drive Arlington, VA 22206; 703/671-9100
AWPA	American Wood Preservers' Association P.O. Box 849 Stevensville, MD 21666; 301/643-4163
AWPB	American Wood Preservers Bureau P.O. Box 5283 Springfield, VA 22150; 703/339-6660
AWS	American Welding Society 550 LeJune Road, NW P.O. Box 351040 Miami, FL 33135; 305/443-9353
AWWA	American Water Works Association 6666 W. Quincy Avenue Denver, CO 80235; 303/794-7711
BHMA	Builders' Hardware Manufacturers Association 355 Lexington Avenue, 17th Avenue New York, NY 10017; 212/661-4261
BIA	Brick Institute of America 11490 Commerce Park Drive, Suite 200 Reston, VA 22091; 703/620-0010
CE	Corps of Engineers (U.S. Department of the Army) Washington, DC 20314; 202/272-0660

CPSC Consumer Product Safety Commission
National Injury Information Clearinghouse
5401 Westbard Avenue; Bethesda, MD 20816
800/638-2772

CRSI Concrete Reinforcing Steel Institute
933 Plum Grove Road
Schaumburg, IL 60173; 312/517-1200

DHI Door and Hardware Institute
7711 Old Springhouse Road
McLean, VA 22102; 703/556-3990

FGMA Flat Glass Marketing Association
3310 Harrison
Topeka, KS 66611; 913/266-7013

FM Factory Mutual Engineering & Research Organization
1151 Boston-Providence Turnpike
Norwood, MA 02062; 617/762-4300

FS Federal Specification (General Services Administration)
Specifications Unite (WFSIS)
7th and D Street, SW
Washington, DC 20406; 202/472-2205 or 2140

GA Gypsum Association
810 First Street, NE, Suite 510
Washington, DC 20002; 202/289-5440

IEEE Institute of Electrical & Electronics Engineers
345 East 47th St.
New York, NY 10017; 212/705-7900

IESNA Illuminating Engineering Society of North America
345 E. 47th Street
New York, NY 10017; 212/705-7926

IGCC Insulating Glass Certification Council
c/o ETL Testing Labs
P.O. Box 539 Industrial Park
Cortland, NY 13045; 607/753-6711

ILI Indiana Limestone Institute of America

LPI	Stone City Bank Bldg., Suite 400 Bedford, IN 47421; 812/275-4426 Lightning Protection Institute P. O. Box 1029 Woodstock, IL 60098; 815/337-0277
MIL	Military Standardization Documents (U.S. Department of Defense) Naval Publications and Forms Center 5801 Tabor Avenue Philadelphia, PA 19120
ML/SFA	Metal Lath/Steel Framing Association (Division of NAAMM) 600 South Federal St., Suite 400 Chicago, IL 60605; 312/922-6222
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry 127 Park St., NE Vienna, VA 22180; 703/281-6613
NAAMM	The National Association of Architectural Metal Manufacturers 600 South Federal St., Suite 400 Chicago, IL 60605; 312/922-6222
NCMA	National Concrete Masonry Association PO Box 781 Herndon, VA 22070; 703/435-4900
NECA	National Electrical Contractors Association 7315 Wisconsin Avenue Washington, DC 20014; 202/657-3110
NEII	National Elevator Industry, Inc. 185 Bridge Plaza North Fort Lee, NJ 07024; 201/944-3211
NEMA	National Electrical Manufacturers Association 2101 L Street, NW Washington, DC 20037; 202/457-8400
NEC NFPA	National Electrical Code (by NFPA) National Fire Protection Association One Batterymarch Park Quincy, MA 02269; 617/770-3000

NIST National Institute of Standards and Technology
(formerly National Bureau of Standards; U.S. Dept. of Commerce)
Gaithersburg, MD 20234; 301/921-3405

NPA National Particleboard Association
18928 Premier Court
Gaithersburg, MD 20879; 301/670-0604

NPCA National Paint and Coatings Association
1500 Rhode Island Ave., NW
Washington, DC 20005; 202/462-6272

NRCA National Roofing Contractors Association
6250 River Rd.
Rosemont, ILL 60018; 312/318-6722

NSF National Sanitation Foundation
3475 Plymouth Road
Ann Arbor, MI 48106; 313/769-8010

NTMA The National Terrazzo and Mosaic Association
3166 Des Plains Avenue, Suite 132
Des Plains, IL 60018; 312/635-7744

NWWDA National Wood Window and Door Association (formerly NWMA)
1400 E. Touhy Ave., #G54
Park Ridge, IL 60018; 312/299-5200

OSHA Occupational Safety Health Administration (U.S. Department of
Labor) Government Printing Office
Washington, DC 20402; 202/783-3238

PCA Portland Cement Association
5420 Old Orchard Road
Skokie, IL 60077; 312/966-6200

PCI Prestressed Concrete Institute
175 West Jackson Blvd.
Chicago, IL 60604; 312/786-0300

PDI Plumbing and Drainage Institute
1106 West 77th Street, South Drive
Indianapolis, IN 46260; 317/251-6970

PS Product Standard of NBS (U.S. Department of Commerce)

Government Printing Office
Washington, DC 20402; 202/783-3238

- RFCI Resilient Floor Covering Institute
966 Hangerford Drive, Suite 12-B
Rockville, MD 20805; 301/340-8580
- RIS Redwood Inspection Service (Grading Rules)
405 Enfrente Drive, Suite 200
Novato, CA 94949; 415/382-0662
- SDI Steel Deck Institute
PO Box 9506
Canton, OH 44711; 216/493-7886
- S.D.I. Steel Door Institute
30200 Detroit Rd.
Cleveland, OH 44145; 216/889-0010
- SIGMA Sealed Insulating Glass Manufacturer's
Association
111 E. Wacker Drive
Chicago, IL 60601; 312/644-6610
- SMACNA Sheet Metal & Air Conditioning Contractors' National Assoc.
PO Box 70
Merrifield, VA 22116; 703/790-9890
- SPIB Southern Pine Inspection Bureau (Grading Rules)
4709 Scenic Hwy.
Pensacola, FL 32504; 904/434-2611
- SSPC Steel Structures Painting Council
4400 5th Avenue
Pittsburgh, PA 15213; 412/268-3327
- TCA Tile Council of America
PO Box 326
Princeton, NJ 08540; 609/921-7050
- TIMA Thermal Insulation Manufacturers Association
29 Bank Street
Stamford, CT 06901; 203/324-7533

- UL Underwriters Laboratories
333 Pflingsten Road
Northbrook, IL 60062; 312/272-8800

- WCLIB West Coast Lumber Inspection Bureau (Grading Rules)
PO Box 2345
Portland, OR 97223; 503/639-0651

- WWPA Western Wood Products Association (Grading Rules)
1500 Yeon Bldg., 522 SW 5th Ave.
Portland, OR 97204; 503/224-3930

1.3 GOVERNING REGULATIONS/AUTHORITIES:

- A. The A/E has contacted authorities having jurisdiction for the listed Regulations and Codes where necessary to obtain information for preparation of the Contract Documents. Contact authorities having jurisdiction directly for information on decisions having bearing on Work.
 - 1. Life Safety code, NFPA 101.
 - 2. Standard Building Code, Southern Building Code Congress International, (for all items not covered by Life Safety Code)
 - 3. National Fire Codes, NFPA (applicable to work).
 - 4. Energy Conservation Design Standard for New State Buildings.
 - 5. Standard Plumbing Code, Souther Building Code Congress International.
 - 6. Building Service Piping, ASME/ANSI B 31.9.
 - 7. Texas Accessibility Standards (TAS) Texas Department of Licensing and Regulations, Architectural Barriers Act, Article 9102, Texas Civil Statutes.
 - 8. American Disabilities Act, Part III, 28 CFR 36, July 26, 1991.
 - 9. Safety Code for Elevators and Escalators, ASME A 17.1 and A 17.3.

1.4 DEFINITIONS:

- A. Require and Words of Similar Import: As required to complete the Work as required by A/E, unless stated otherwise.

- B. Perform: Contractor, at its expense, shall perform operations necessary to complete Work, including furnishing of necessary labor, tools and equipment, and further including furnishing and installing of materials indicated, specified or required to complete such performance.

- C. Provide: Contractor, at its expense, shall furnish and install Work complete in place and ready for use, including furnishing of necessary labor, materials, tools,

- equipment and transportation. Definitions apply same to future, present and past tenses, except word "provide" may mean "contingent upon" where such is context.
- D. Other Acceptable Manufacture, Equal, Acceptable Equal, Equivalent and Words of Similar Import: It shall be understood such words are followed by expression "in opinion of A/E" unless stated otherwise.
- E. Acceptable, Acceptance or Words of Similar Import: Acceptance or similar import of A/E is intended unless stated otherwise.
- F. At No Extra Cost to Owner, With No Extra Compensation to Contractor, at Contractor's Expense or Terms of Similar Import: Such terms shall be understood to mean that Contractor shall perform or provide specified operation of Work at no increase to Contract Sum stated in executed Contract.
- G. NIC: Work of this Project, which is not being performed or provided as part of Contract; term shall mean "Not In This Contract" or "Not a Part of the Work to be Performed or Provided by Contractor." "NIC" Work is indicated as aid to Contractor in scheduling amount of time and materials necessary for completion of Contract.
- H. Indicated: The term "indicated" is a cross-reference to graphics, notes or schedules on Drawings, to other paragraphs or schedules in the Specifications, and to similar means of recording requirements in Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used in lieu of "indicated," it is for purpose of helping reader located cross-reference and no limitation of location is intended except as specifically noted.
- I. Directed, Requested or Similar Wording: Where not otherwise explained, terms such as "directed," "requested," "authorized," "selected," "approved," "required," "accepted," and "permitted" mean "directed by Owner, A/E," "requested by Owner, A/E," and similar directions by Owner, A/E. However, no such implied meaning will be interpreted to extend Owner, A/E's responsibility into Contractor's area of construction supervision.
- J. Approve: Where used in conjunction with Owner, A/E's response to submittals, requests, applications, inquiries, reports and claims by Contractor, the meaning of term "approved" will be held to limitations of Owner, A/E's responsibilities and duties specified in General Conditions. In no case will "approval" by Owner, A/E be interpreted as a release of Contractor from responsibilities to fulfill requirements of Contract Documents.
- K. Project Site: The space available to Contractor for performance of the Work, either exclusively or in conjunction with others performing other Work as part of the Project.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01095

DEFINITIONS AND STANDARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to work of this section.

1.2 DEFINITIONS:

- A. General Explanation: A substantial amount of specification language constitutes definitions for terms found in other Contract Documents, including drawings which must be recognized as diagrammatic in nature and not completely descriptive of requirements indicated thereon. Certain terms used in Contract Documents are defined generally in this article. Definitions and explanations of this section are not necessarily either complete or exclusive, but are general for the work to extent not stated more explicitly in another provision of Contract Documents.
- B. General Requirements: The provisions or requirements of Division 1 sections. General Requirements apply to entire work of Contract and, where so indicated, to other elements which are included in project.
- C. Indicated: The term "Indicated" is a cross- reference to details, notes or schedules on drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used in lieu of "indicated," it is for purpose of helping reader locate cross-reference, and no limitation of location is intended except as specifically noted.
- D. Directed, Requested, etc.: Where not otherwise explained, terms such as "directed," "requested," "authorized," "selected," "approved," "required," "accepted," and "permitted" mean "directed by Architect/Engineer," "requested by Architect/Engineer," etc. However, no such implied meaning will be interpreted to extend Architect's/Engineer's responsibility into Contractor's area of construction supervision.
- E. Approved: Where used in conjunction with Architect's/Engineer's response to submittals, requests, applications, inquiries, reports and claims by Contractor, the meaning of term "approved" will be held to limitations of Architect's/Engineer's responsibilities and duties as specified in General and Supplementary Conditions. In no case will "approval" by Architect/Engineer be interpreted as a release of

Contractor from responsibilities to fulfill requirements of Contract Documents.

- F. Project Site: The space available to Contractor for performance of the work, either exclusively or in conjunction with others performing other work as part of the project. The extent of project site is shown on drawings, and may or may not be identical with description of land upon which project is to be built.
- G. Furnish: Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
- H. Install: Except as otherwise defined in greater detail, term "install" is used to describe operations at project site including unloading, storage, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations, as applicable in each instance.
- I. Provide: Except as otherwise defined in greater detail, term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.
- J. Installer: The entity (person or firm) engaged by Contractor or its subcontractor or sub-subcontractor for performance of a particular unit of work at project site, including installation, erection, application and similar required operations. It is a general requirement that such entities (Installers) be expert in operations they are engaged to perform.
- K. Testing Laboratory: An independent entity engaged to perform specific inspections or tests of the work, both at project site or elsewhere; and to report and (if required) interpret results of those inspections or tests.
- L. Owner Furnished - Contractor Installed (OFICI): Equipment or components of a system that are purchased by the Owner and furnished to the Contractor for installation in the project. The Contractor shall receive, store, protect, install, connect and test each item unless otherwise indicated.
- M. Contractor Furnished - Contractor Installed (CFCI): Equipment or components of a system that are purchased, furnished and installed by the Contractor.
- N. Owner Furnished - Owner Installed (OFOI): Equipment or components of a system that are purchased, furnished and installed by the Owner or his vendors.

1.3 FORMAT AND SPECIFICATION EXPLANATIONS:

- A. Specification Production: None of these explanations will be interpreted to modify

substance of requirements. Portions of these specifications have been produced by Architect's/Engineer's standard methods of editing master specifications, and may contain minor deviations from traditional writing formats. Such deviations are a normal result of this production technique, and no other meaning will be implied or permitted.

- B. Format Explanation: The format of principal portions of these specifications can be described as follows; although other portions may not fully comply and no particular significance will be attached to such compliance or noncompliance.
1. Sections and Divisions: For convenience, basic unit of specification text is a "section," each unit of which is named and numbered. These are organized into related families of sections, and various families of sections are organized into "divisions," which are recognized as the present industry consensus on uniform organization and sequencing of specifications. The section title is not intended to limit meaning or content of section, nor to be fully descriptive of requirements specified therein or to be an integral part of text.
 2. Each section of specifications has been subdivided into 3 (or less) "parts" for uniformity and convenience (Part 1 -General, Part 2 Products, and Part 3 Execution). These do not limit the meaning of and are not an integral part of text which specifies requirements.
 - a. Underscoring: Used strictly to assist reader of specification text in scanning text for key words in content (for quick recall). No emphasis on or relative importance of text is intended where underscoring is used.
 - b. Imperative Language: Used generally in specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by Contractor. For clarity of reading at certain locations, contrasting subjective language is used to describe responsibilities which must be fulfilled indirectly by Contractor, or when so noted, by others.
 - c. Section Numbering: Used to facilitate cross-references in Contract Documents. Sections are placed in Project Manual in numeric sequence; however, numbering sequence is not complete, and listing of sections at beginning of Project Manual must be consulted to determine numbers and names of specification section in Contract Documents.
 3. Specification Content: Because of methods by which this project specification has been produced, certain general characteristics of content, and conventions in use of language are explained as follows:
 - a. Specifying Methods: The techniques or methods of specifying to record requirements vary throughout text, and may include "prescriptive," "open generic descriptive," "compliance with standards," "performance," or a

combination of these. The method used for specifying one unit of work has no bearing on requirements for another unit of work.

- b. **Overlapping and Conflicting Requirements:** Where compliance with 2 or more industry standards or sets of requirements are specified, and overlapping of those different standards or requirements establishes different or conflicting minimums or levels of quality, most stringent requirement (which is generally recognized to be also most costly) is intended and will be enforced, unless specifically detailed language written into contract documents (not by way of reference to an industry standard) clearly indicates that a less stringent requirement is to be fulfilled. Refer apparently-equal-but-different requirements, and uncertainties as to which level of quality is more stringent, to Architect/Engineer for a decision before proceeding.
 1. **Contractor's Options:** Except for overlapping or conflicting requirements, where more than one set of requirements are specified for a particular unit of work, option is intended to be Contractor's regardless of whether specifically indicated as such.
- c. **Minimum Quality/Quantity:** In every instance, quality level or quantity shown or specified is intended as minimum for the work to be performed or provided. Except as otherwise specifically indicated, actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable limits. In complying with requirements, indicated numeric values are either minimums or maximums as noted or as appropriate for context of requirements. Refer instances of uncertainty to Architect/Engineer for decision before proceeding.
- d. **Specialists; Assignments:** In certain instances, specification text requires (or at least implies) that specific work be assigned to specialists or expert entities, who must be engaged for performance of those units of work. These must be recognized as special requirements over which Contractor has no choice or option. These assignments must not be confused with (and are not intended to interfere with) normal application of regulations, union jurisdictions and similar conventions. One purpose of such assignments is to establish which party or entity involved in a specific unit of work is recognized as "expert" for indicated construction processes or operations. Nevertheless, final responsibility for fulfillment of entire set of requirements remains with Contractor.
 1. **Trades:** Except as otherwise indicated, the use of titles such as "carpentry" in specification text, implies neither that the work must be performed by an accredited or unionized

tradesperson of corresponding generic name (such as "carpenter"), nor that specified requirements apply exclusively to work by tradespersons of that corresponding generic name.

- e. Abbreviations: The language of specifications and other Contract Documents is of the abbreviated type in certain instances and implies words and meanings which will be appropriately interpreted. Actual word abbreviations of a self-explanatory nature have been included in texts. Specific abbreviations have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of specification requirements which notations on drawings and in schedules. These are frequently defined in section at first instance of use. Trade association names and titles of general standards are frequently abbreviated.

Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of the contract documents so indicates.

1.4 DRAWING SYMBOLS:

- A. General: Except as otherwise indicated, graphic symbols used on drawings are those symbols recognized in the construction industry for purposes indicated. Where not otherwise noted, symbols are defined by "Architectural Graphic Standards," published by John Wiley & Sons, Inc., Seventh edition.
 - 1. A/E Drawings: Graphic symbols used on mechanical/electrical drawings are generally aligned with symbols recommended by ASHRAE, supplemented by more specific symbols where appropriate as recommended by other recognized technical associations including ASME, ASPE, IEEE and similar organizations. Refer instances of uncertainty to Architect/Engineer for clarification before proceeding.

1.5 INDUSTRY STANDARDS:

- A. General Applicability of Standards: Applicable standards of construction industry have same force and effect (and are made a part of Contract Documents by reference) as if copies directly into Contract Documents, or as if published copies were bound herewith.
 - 1. Referenced Standards: (referenced directly in Contract Documents or by governing regulations) have precedence over non-referenced standards which are recognized in industry for applicability to work.

2. Non-referenced standards are hereby defined to have no particular applicability to the work, except as a general measurement of whether work complies with standards recognized in construction industry.
- B. Publication Dates: Except as otherwise indicated, where compliance with an industry standard is required, comply with standard in effect as of date of Contract Documents.
- C. Copies of Standards: Provide where needed for proper performance of the work; obtain directly from publication sources.
- D. Abbreviations and Names: The following acronyms or abbreviations as referenced in Contract Documents are defined to mean the associated names. Both names and addresses are subject to change, and are believed to be, but are not assured to be, accurate and up-to-date as of date of Contract Documents:

AA Aluminum Association
900 19TH St., NW, Suite 300
Washington, DC 20006; 202/862-5100

AABC Associated Air Balance Council
1518 K St., NW, Suite 503
Washington, DC 20005; 202/737-0202

AAMA Architectural Aluminum Manufacturer's
Association
2700 River Rd., Suite 118
Des Plaines, IL 60018; 312/699-7310

AAN American Association of Nurserymen
1250 Eye St., NW, Suite 500
Washington, DC 20005; 202/789-2900

AASHTO American Association of State Highway
and Transportation Officials
444 North Capital St., Suite 225
Washington, DC 20001; 202/624-5800

ACI American Concrete Institute
PO Box 19150
Detroit, MI 48219; 313/532-2600

ACIL American Council of Independent
Laboratories
1725 K Street, NW
Washington, DC 20006; 202/887-5872

ACPA American Concrete Pipe Assoc.
8300 Boone Blvd., Suite 400
Vienna, VA 22180; 703/821-1990

ADC Air Diffusion Council
230 N. Michigan Ave., Suite 1200
Chicago, IL 60601; 312/372-9800

AGA American Gas Association
1515 Wilson Blvd.
Arlington, VA 22209; 703/841-8400

AHA American Hardboard Assoc.
520 N. Hicks Rd.
Palatine, IL 60067; 312/934-8800

AI Asphalt Institute
Research Park Drive
P.O. Box 14052
Lexington, KY 40512-4052; 606/288-4960

AIA American Institute of Architects
1735 New York Avenue, NW
Washington, DC 20006; 202/626-7300

A.I.A. American Insurance Association
1130 Connecticut Ave., NW
Washington, DC 20036; 202/828-7100

AISC American Institute of Steel Construction
One East Wacker Drive, Suite 3100
Chicago, IL 60601; 312/670-2400

AISI American Iron and Steel Institute
1133 Fifteenth St., NW
Washington, DC 20005; 202/452-7100

AITC American Institute of Timber Construction
11818 E. Mill Plain Blvd.
Vancouver, WA 98684; 206/254-9132

AMCA Air Movement and Control Association
30 W. University Drive
Arlington Heights, IL 60004; 312/394-0150

ANSI American National Standards Institute
1430 Broadway
New York, NY 10018; 212/354-3300

APA American Plywood Association
PO Box 11700
Tacoma, WA 98411; 206/565-6600

ARI Air Conditioning and Refrigeration Institute
1501 Wilson Blvd., 6th Floor
Arlington, VA 22209; 703/524-8800

ARMA Asphalt Roofing Manufacturers Assoc.
6288 Montrose Rd.
Rockville, MD 20852; 301/231-9050

ASC Adhesive and Sealant Council
1627 K Street, NW, Suite 1000
Washington, DC 20006; 202/452-1500

ASHRAE American Society of Heating, Refrigerating
and Air-Conditioning Engineers
1791 Tullie Circle, NE
Atlanta, GA 30329; 404/636-8400

ASME American Society of Mechanical Engineers
345 East 47th Street
New York, NY 10017; 212/705-7722

ASPE American Society of Plumbing Engineers
3617 Thousand Oaks Blvd., Suite 210
Westlake, CA 91362; 805/495-7120

ASSE American Society of Sanitary Engineering
PO Box 40362
Bay Village, OH 44140; 216/835-3040

ASTM	American Society for Testing and Materials 1916 Race St. Philadelphia, PA 19103; 215/299-5400
AWI	Architectural Woodwork Institute 2310 S. Walter Reed Drive Arlington, VA 22206; 703/671-9100
AWPA	American Wood Preservers' Association P.O. Box 849 Stevensville, MD 21666; 301/643-4163
AWPB	American Wood Preservers Bureau P.O. Box 5283 Springfield, VA 22150; 703/339-6660
AWS	American Welding Society 550 LeJune Road, NW P.O. Box 351040 Miami, FL 33135; 305/443-9353
AWWA	American Water Works Association 6666 W. Quincy Avenue Denver, CO 80235; 303/794-7711
BHMA	Builders' Hardware Manufacturers Association 355 Lexington Avenue, 17th Avenue New York, NY 10017; 212/661-4261
BIA	Brick Institute of America 11490 Commerce Park Drive, Suite 200 Reston, VA 22091; 703/620-0010
CE	Corps of Engineers (U.S. Department of the Army) Washington, DC 20314; 202/272-0660
CISPI	Cast Iron Soil Pipe Institute 5959 Shallowford Road, Suite 419 Chattanooga, TN 37421; 615/892-0137
CRSI	Concrete Reinforcing Steel Institute 933 Plum Grove Road Schaumburg, IL 60173; 312/517-1200

CS Commercial Standard of NBS (U.S. Department of Commerce)
Government Printing Office
Washington DC 20402; 202-377-2000

DHI Door and Hardware Institute
7711 Old Springhouse Road
McLean, VA 22102; 703/556-3990

EIA Electronic Industries Association
1722 Eye St., NW; Suite 300
Washington, DC 20006; 202/457-4900

EIMA Exterior Insulation Manufacturers Assoc.
30 Holley Street
Wakefield, RI 02879; 401-782-3687

FAA Federal Aviation Administration (U.S.
Department of Transportation)
800 Independence Avenue, SW
Washington, DC 20590; 202/366-4000

FCC Federal Communications Commission
1919 M. St., NW
Washington, DC 20554; 202/632-7000

FCI Fluid Controls Institute
PO Box 9036
Morristown, NJ 07960; 201/829-0990

FGMA Flat Glass Marketing Association
3310 Harrison
Topeka, KS 66611; 913/266-7013

FHA Federal Housing Administration (U.S.
Department of HUD)
451 7th St., SW
Washington, DC 20201; 202/755-5210

FM Factory Mutual Engineering Corp.
1151 Boston-Providence Turnpike
Norwood, MA 02062; 617/762-4300

FS	Federal Specification Specifications Unite (WFSIS) 7th and D Street, SW Washington, DC 20406; 202/472-2205
FTI	Facing Tile Institute Box 8880 Canton, OH 44711; 216/488-1211
GA	Gypsum Association 810 First Street, NE, Suite 510 Washington, DC 20002; 202/289-5440
HMA	Hardwood Manufacturers Assoc. 2831 Airways Blvd. Suite 205, Building B Memphis, TN 38132; 901/346-2222
HPMA	Hardwood Plywood Manufacturers Association PO Box 2789 Reston, VA 22090; 703/435-2900
IEEE	Institute of Electrical & Electronics Engineers 345 East 47th St. New York, NY 10017; 212/705-7900
IES	Illuminating Engineering Society of North America 345 E. 47th Street New York, NY 10017; 212/644-7926
ILI	Indiana Limestone Institute of America Stone City Bank Bldg., Suite 400 Bedford, IN 47421; 812/275-4426
IRI	Industrial Risk Insurers 85 Woodland St. Hartford, CT 06102; 203/520-7300
LPI	Lightning Protection Institute P. O. Box 1029 Woodstock, IL 60098; 815/337-0277
MCAA	Mechanical Contractors Association of America 1385 Piccard Drive Rockville, MD 20832; 301-869-5800

MIA	Marble Institute of America 33505 State St. Farmington, MI 48024; 313/476-5558
MIL	Military Standardization Documents (U.S. Department of Defense) Naval Publications and Forms Center 5801 Tabor Avenue Philadelphia, PA 19120
MLSFA	Metal Lath/Steel Framing Association 600 South Federal St., Suite 400 Chicago, IL 60605; 312/922-6222
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry 127 Pike St., NE Vienna, VA 22180; 703/281-6613
NAAMM	The National Association of Architectural Metal Manufacturers 600 South Federal St., Suite 400 Chicago, IL 60605; 312/922-6222
NAPA	National Asphalt Pavement Association Calvert Building, Suite 620 6811 Kenilworth Ave. Riverdale, MD 20737; 301/779-4880
NBGQA	National Building Granite Quarries Association P. O. Box 482 Barre, VT 05641; 802/476-3115
NBS	National Bureau of Standards (U.S. Department of Commerce) Gaithersburg, MD 20234
NCMA	National Concrete Masonry Association PO Box 781 Herndon, VA 22070; 703/435-4900
NEC	National Electrical Code (by NFPA)

NECA National Electrical Contractors Association
7315 Wisconsin Avenue
Washington, DC 20014; 202/657-3110

NEII National Elevator Industry, Inc.
185 Bridge Plaza North
Fort Lee, NJ 07024; 201/944-3211

NEMA National Electrical Manufacturers Association
2101 L Street, NW
Washington, DC 20037; 202/457-8400

NFPA National Fire Protection Association
One Batterymarch Park
Quincy, MA 02269; 617/770-3000

N.F.P.A. National Forest Products Association
1250 Connecticut Ave., NW Suite 200
Washington, DC 20036; 202/463-2700

NHLA National Hardwood Lumber Association
PO Box 34518
Memphis, TN 38184; 901/377-1818

NPA National Particleboard Association
18928 Premier Court
Gaithersburg, MD 20879; 301/670-0604

NSF National Sanitation Foundation
3475 Plymouth Road
Ann Arbor, MI 48106; 313/769-8010

NTMA The National Terrazzo and Mosaic Association
3166 Des Plains Avenue, Suite 132
Des Plains, IL 60018; 312/635-7744

NWWDA National Wood Window and Door Association
1400 E. Touhy Ave., #G54
Des Plaines, IL 60018; 312/299-5200

OSHA Occupational Safety Health Administration
(U.S. Department of Labor)
Government Printing Office
Washington, DC 20402

PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077; 312/966-6200
PCI	Prestressed Concrete Institute 175 West Jackson Blvd. Chicago, IL 60604; 312/786-0300
PDI	Plumbing and Drainage Institute 1106 West 77th Street, South Drive Indianapolis, IN 46260; 317/251-6970
PEI	Porcelain Enamel Institute 1101 Connecticut Ave., NW, Suite 70 Washington, DC 20036; 2102/867-1134
PS	Product Standard of NBS (U.S. Department of Commerce) Government Printing Office Washington, DC 20402; 202/783-3238
RFCI	Resilient Floor Covering Institute 966 Hangerford Drive, Suite 12-B Rockville, MD 20805; 301/340-8580
RIS	Redwood Inspection Service (Grading Rules) 405 Enfrente Drive, Suite 200 Novato, CA 94949; 415/382-0662
SDI	Steel Deck Institute PO Box 9506 Canton, OH 44711; 216/493-7886
S.D.I.	Steel Door Institute 30200 Detroit Rd. Cleveland, OH 44145; 216/889-0010
SIGMA	Sealed Insulating Glass Manufacturer's Association 111 E. Wacker Drive Chicago, IL 60601; 312/644-6610
SJI	Steel Joist Institute 1205 48th Avenue North, Suite A Myrtle Beach, SC 29577; 803/449-0487

SMACNA Sheet Metal & Air Conditioning Contractors' National Assoc.
PO Box 70
Merrifield, VA 22116; 703/790-9890

SPIB Southern Pine Inspection Bureau (Grading Rules)
4709 Scenic Hwy.
Pensacola, FL 32504; 904/434-2611

SSPC Steel Structures Painting Council
4400 5th Avenue
Pittsburgh, PA 15213; 412/578-3327

TCA Tile Council of America
PO Box 326
Princeton, NJ 08540; 609/921-7050

TIMA Thermal Insulation Manufacturers Association
29 Bank Street
Stamford, CT 06901; 203/324-7533

UL Underwriters Laboratories
333 Pfingsten Road
Northbrook, IL 60062; 312/272-8800

WCLIB West Coast Lumber Inspection Bureau (Grading Rules)
PO Box 2345
Portland, OR 97223; 503/639-0651

WCMA Wallcovering Manufacturers Association
355 Lexington Ave.
New York, NY 10017; 212/661-4261

WRI Wire Reinforcement Institute
1760 Reston Parkway, Suite 403
Reston, VA 22090; 703/790-9790

WSFI Wood and Synthetic Flooring Institute
4415 West Harrison St., Suite 242C
Hillside, IL 60162; 708/449-2933

WWPA Western Wood Products Association (Grading Rules)
1500 Yeon Bldg.
Portland, OR 97204; 503/224-3930

W.W.P.A. Woven Wire Products Association
2515 North Nordica Ave.
Chicago, IL 60635; 312/637-1359

1.6 GOVERNING REGULATIONS/AUTHORITIES:

- A. General: The procedure followed by Architect/Engineer has been to contact governing authorities where necessary to obtain information needed for the purpose of preparing Contract Documents; recognizing that such information may or may not be of significance in relation to Contractor's responsibilities for performing the work. Contact governing authorities directly for necessary information and decisions having a bearing on performance of the work.

1.7 SUBMITTALS:

- A. Permits, Licenses and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the work.

END OF SECTION

SECTION 01152

APPLICATIONS FOR PAYMENT

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to work of this section.

1.2 COORDINATION:

- A. Coordinate both the procedural timing and the listing (naming and sequencing) of reports/activities required by provisions of this section and other sections, to afford consistency and logical coordination between submitted reports or lists. Maintain coordination and correlation between separate reports by updating at monthly or shorter time intervals. Make appropriate distribution of each report and updated report to entities involved in the work including Architect/Engineer and Project Manager. In particular, provide close coordination of progress schedule, equipment, delivery schedule, schedule of values, listing of subcontracts, schedule of submittals, progress reports, and payment requests.

1.3 PAYMENT REQUESTS:

- A. General: Except as otherwise indicated, sequence of progress payments is to be regular, and each must be consistent with previous applications and payments. It is recognized that certain applications involve extra requirements, including initial application, application at times of Substantial Completion, and final payment application.
 - 1. Waiver Delays: Each progress payment must be submitted with Contractor's lien waiver for period of construction covered by application; but may, at Contractor's option, be submitted with waivers from subcontractors, subcontractors and suppliers for previous period of construction covered by previous application; except final payment application must be submitted with (or preceded by) final or full waivers from every entity involved with performance of the work.
 - 2. Waiver Forms: Submit waivers on forms, and executed in a manner, acceptable to the Owner.
 - 3. Payment Application Times: The "date" for each progress payment is the first day of each month. The period of construction work covered by each payment request is period indicated in Owner/Contractor Agreement or, if none is

indicated therein, it is period ending 5 days prior to date for each progress payment, and starting day following end of the preceding period.

4. Payment Application Forms: AIA Document G702 and Continuation Sheets.
5. Application Preparation: Except as otherwise indicated, complete every entry provided for on the form, including notarization and execution by authorized persons. Incomplete applications will be returned by Architect without action. Entries must match current data of schedule of values and progress schedule and report. Listing must include amounts of change orders issued prior to first day of the "period of construction" covered by application. Line items shall be adjusted by the amount of approved change orders. Separate listing of change orders will not be acceptable.
6. Initial Payment Application: The principal administrative actions and submittals which must precede or coincide with submittal of first payment Application can be summarized as follows, but not necessarily by way of limitation:

Listing of subcontractors, principal suppliers and fabricators.

Schedule of values.

Progress schedule (preliminary if not final).

Schedule of principal products.

Schedule of unit prices (if required).

Schedule of submittals (preliminary if not final).

Listing of Contractor's staff assignments and principal consultants.

Copies of acquired building permits and similar authorizations and licenses from governing authorities for current performance of the work.

7. Application at time of Substantial Completion: Following issuance of Architect's final "certificate of Substantial Completion", and also in part as applicable to prior certificates on portions of completed Work as designated, a "special" payment application may be prepared and submitted by Contractor. The principal administrative actions and submittals, which must proceed or coincide with such special applications can be summarized as follows, but not necessarily by way of limitation:

- a. Occupancy permits and similar approvals or certifications by governing authorities and franchised services, assuring Owner's full access and use of completed Work.
 - b. Warranties, guarantees, maintenance agreements and similar provisions of Contract Documents.
 - c. Test/adjust/balance records, maintenance instructions, and similar changeover information germane to Owner's occupancy, use, operation and maintenance of completed work.
 - d. Final cleaning of the work.
 - e. Application for reduction (if any) of retainage, and consent of surety (if required).
 - f. Advice to Owner on coordination of shifting insurance coverage, including proof of extended coverage as required.
 - g. Listing of Contractor's incomplete work, recognized as exceptions to Architect's certificate of Substantial Completion.
8. Final Payment Application: The administrative actions and submittals which must precede or coincide with submittal of final payment application can be summarized as follows, but not necessarily by way of limitation:
- a. Completion of project closeout requirements.
 - b. Completion of items specified for completion beyond time of Substantial Completion (regardless of whether special payment application was previously made).
 - c. Assurance, satisfactory to Project Manager and Owner, that unsettled claims will be settled and that work not actually completed and accepted will be completed without undue delay.
 - d. Transmittal of required project construction records to Project Manager including record drawings.
 - e. Proof, satisfactory to Project Manager and Owner, that taxes, fees and similar obligations of contractor have been paid.
 - f. Removal of temporary facilities, services, surplus materials, rubbish and similar elements.
 - g. Change over of door locks and other Contractor's access provisions to area of work.

- h. Application Transmittal: Submit 4 executed copies of each payment application. Two copies are to be transmitted to the Architect/Engineer. One copy with waivers of lien, actual cost of work substantiation, and similar attachments is to be transmitted direct to Project Manager. Transmit each copy with a transmittal form listing those attachments, and recording appropriate information related to application in a manner acceptable to Architect. Transmit to Architect by means ensuring receipt within 24 hours.

PART 2 PRODUCTS

(Not applicable)

PART 3 EXECUTION

(Not applicable)

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- 1.1.1 Bidding and Contract Requirements and Division 1 - General Requirements of the Specifications apply to this work.

1.2 SECTION INCLUDES:

- 1.2.1 Requirements for the arrangement, distribution of notices, and maintenance of records for progress meetings, and pre-installation meetings.

1.3 GENERAL:

- 1.3.1 Contractors, subcontractors and suppliers representatives attending the meetings /conferences of this section shall be qualified and authorized to act on behalf of the entity each represents.
- 1.3.2 Comply with the following meeting requirements after execution of the Contract.
 - 1.3.2.1 Arrangements: Arrange for a convenient, comfortable room in which to conduct the progress meetings, furnished as necessary to accommodate the people involved and to accomplish the purpose of the meeting.
 - 1.3.2.2 Notices: Distribute written notices to all concerned at least 1 week in advance of the meeting date.
 - 1.3.2.3 Records: Keep notes during each meeting and distribute them in the form of minutes of the meeting to all concerned within 4 days after the adjournment of the meeting.
 - 1.3.2.4 Schedule Updating: Immediately following each progress meeting, where revisions to the progress schedule have been made or recognized, revise the progress schedule. Reissue revised schedule concurrently with report of each meeting.

1.4 PROGRESS MEETINGS:

- 1.4.1 Chairman: Contractor's Project Manager or Project Superintendent shall preside over the meeting.
- 1.4.2 Attendance: The following persons will be expected to attend:
 - 1.4.2.1 Owner's Representatives.
 - 1.4.2.2 Architect/Engineer's Construction Administrator.

- 1.4.2.3 Architect/Engineer's Consultants for Mechanical and Electrical Engineering until excused from attendance.
 - 1.4.2.4 Contractor's General Superintendent, Project Superintendent and Project Manager.
 - 1.4.2.5 Subcontractors who have work in progress.
 - 1.4.2.6 Subcontractor who will start work within the next month.
 - 1.4.2.7 Others as requested by Owner, Architect/ Engineer, or Contractor.
- 1.4.3 Agenda: The Contractor will provide a written agenda including but not necessarily limited to the following items:
- 1.4.3.1 Present a brief written narrative of construction progress since the last monthly meeting containing:
 - a. General description of work performed.
 - b. Expectation of meeting scheduled dates.
 - c. Description of current or anticipated delaying factors or problems, if any.
 - 1.4.3.2 Review the updated Progress Schedule and present a written schedule analysis.
 - 1.4.3.3 Review the Submittal Schedule/Log.
 - 1.4.3.4 Review the Revision Log.
 - 1.4.3.5 Review of Requests for Information.
 - 1.4.3.6 Review of Architectural Supplemental Instructions.
 - 1.4.3.7 Review of Record Drawings.
 - 1.4.3.8 Review/approval of the Pay Request.
 - 1.4.3.9 General discussion: Other outstanding/current business.
- 1.4.4 Number of Meetings: A minimum of one progress meeting shall be held each month. Other weekly or biweekly progress meetings shall be held as determined by the Architect and shall cover those subjects as required by the Architect.

1.5 PRE-INSTALLATION MEETINGS:

- 1.5.1 Convene a pre-installation meeting at the Project field office prior to commencing any work.
- 1.5.2 Require attendance of entities directly affecting, or affected by, work of Section.
- 1.5.3 Notify Architect seven (7) days in advance of meeting date.
- 1.5.4 Contractor shall prepare agenda, preside at meeting, record minutes, and distribute copies within four (4) working days after meeting to participants, with three (3) copies furnished to the Architect and one (1) copy furnished to the Owner.
- 1.5.5 Review conditions of installation, preparation and installation procedures, and

coordination with related work. Review submittals for all work to be installed.

1.5.6 The Contractor shall maintain an adequate inspection system and perform such inspection to insure that the work called for by this contract conforms to the contract specifications and requirements.

1.5.7 The Contractor shall maintain complete inspection records and make them available to the Owner's Representative.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01205

PROCEDURES AND CONTROLS

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including Supplementary Conditions and other Division 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK:

- A. The types of minimum requirements for procedural and performance or control work of a general nature include but are not necessarily limited to the following categories:

- Coordination and meetings.
- Administrative/supervisory personnel.
- Records or reports.
- Limitations for use of area.
- Special reports.
- Tradesmen and workmanship standards.
- Inspections, tests and reports.
- General installation provisions.
- Cutting and patching.
- Cleaning and protection.
- Conservation and salvage.

1.3 COORDINATION AND MEETINGS:

- A. General: Prepare and distribute to each entity performing work at project, a written memorandum of instructions on required coordination activities, including required notices, reports and attendance at meetings. Prepare similar memorandum for separate contractors where interfacing of work is required.

1.4 TRADESPERSONS AND WORKMANSHIP STANDARDS:

- A. General: Instigate and maintain procedures to ensure that persons performing work at site are skilled and knowledgeable in methods and craftsmanship needed to produce required quality levels for workmanship in completed work. Remove and replace work which does not comply with workmanship standards as specified and as recognized in the construction industry for applications indicated. Remove and replace other work damaged or deteriorated by faulty workmanship or its replacement.
- B. Availability of Tradespersons: At each progress or coordination meeting, review

availability of tradespersons and projected needs to accomplish work as scheduled. Require each prime entity employing personnel to report on current and pending trade union actions and jurisdictional matters which might affect progress of work. Where possible, consider alternatives and take actions to avoid disputes and delays.

1.5 INSPECTIONS, TESTS AND REPORTS:

- A. General: Required inspection and testing services are intended to assist in determination of probable compliances of work with requirements, but do not relieve Contractor of responsibility for those compliances, or for general fulfillment of requirements of Contract Documents. Specified inspections and tests are not intended to limit Contractor's quality control program. Afford reasonable access to agencies performing tests and inspections.
 - 1. Owner's Tests: Where on-site tests or inspections are indicated, the Owner will engage independent testing agency to perform required services.
- B. Reports: The Owner's agency will submit test/inspection reports, including agency's analysis of results and recommendations where applicable, to the Contractor and Architect/Engineer except as otherwise indicated.

PART 2 PRODUCTS:

(Not Applicable)

PART 3 EXECUTION:

3.1 GENERAL INSTALLATION PROVISIONS:

- A. Pre-Installation Conferences: Well in advance of installation of every major unit of work which requires coordination and interfacing with other work, meet at project site with installers and representatives of manufacturers and fabricators who are involved in or affected by unit of work, and in its coordination or integration with other work which has preceded or will follow. Advise Architect/Engineer and Owner of scheduled meeting dates. At each meeting review progress of other work and preparations for particular work under consideration, including requirements of contract documents, options, related change orders, purchase, deliveries, shop drawings, product data, quality control samples, possible conflicts, compatibility problems, time schedules, weather limitations, temporary facilities, space and access limitations, structural limitations, governing regulations, safety, inspection and testing requirements required performance results, recording requirements, and protection. Record significant discussions of each conference, and record agreements and disagreements, along with final plan of action. Distribute record of meeting within two (2) days promptly to everyone concerned, including Architect/Engineer.

1. Do not proceed with the work if associated pre-installation conference cannot be concluded successfully. Instigate actions to resolve impediments to performance of the work, and reconvene conference at earliest date feasible.
2. Installer's Inspection of Conditions: Require Installer of each major unit of work to inspect substrate to receive the work, and conditions under which work will be performed, and to report (in writing to Contractor) unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.
3. Manufacturer's Instructions: Where installations include manufactured products, comply with manufacturer's applicable instructions and recommendations for installation, to extent these are more explicit or more stringent than requirements indicated in Contract Documents.
4. Inspect each item of materials or equipment immediately prior to installation, and reject damaged and defective items.
5. Provide attachment and connection devices and methods for securing work properly as it is installed; true to line and level, and within recognized industry tolerances if not otherwise indicated. Allow for expansions and building movements. Provide uniform joint widths in exposed work, organized for best possible visual effect. Refer questionable visual-effect choices to Architect for final decision.
6. Recheck measurements and dimensions of the work, as an integral step of starting each installation.
7. Install work during conditions of temperature, humidity, exposure, forecasted weather, and status of project completion which will ensure best possible results for each unit of work, in coordination with entire work. Isolate each unit of work from non-compatible work, as required to prevent deterioration.
8. Coordinate enclosure (closing-in) on work with required inspections and tests, so as to avoid necessity of uncovering work for that purpose.
9. Mounting Heights: Where mounting heights are not indicated, mount individual units of work at industry-recognized standard mounting heights for applications indicated. Refer questionable mounting height choices to Architect/Engineer for final decision.

3.2 CUTTING AND PATCHING:

- B. General: Do not cut-and-patch structural work in a manner resulting in reduction of load-carrying capacity or load/deflection ratio; submit proposed cutting and patching to Architect/Engineer for structural approval before proceeding. Do not cut-and-patch operational elements and safety-related components in a manner resulting in reduction of capacities to perform in manner intended or resulting in decreased operational life, increased maintenance, or decreased safety. Do not cut-and-patch work which is exposed on exterior or in occupied spaces of building, in a manner resulting in reduction of visual qualities or resulting in substantial evidence of cut-and-patch work, both as judged solely by Architect. Remove and replace work judged by Architect to be cut-and-patched in a visually unsatisfactory or otherwise objectionable manner.
- C. Materials: Except as otherwise indicated or approved by Architect/Engineer, provide materials for cutting-and-patching which will result in equal-or-better work than work being cut-and-patched; in terms of performance characteristics and including visual effect where applicable. Use materials identical with original materials where feasible and where recognized that satisfactory results can be produced thereby.
- D. Temporary Support and Protection: Provide adequate temporary support for work to be cut, to prevent failure. Do not endanger other work. Provide adequate protection of other work during cutting-and-patching, to prevent damage; and provide protection of the work from adverse weather exposure.
- D. Cut work by methods least likely to damage work to be retained and work adjoining.
 - 1. Where physical cutting action is required, cut work with sawing and grinding tools, not with hammering and chopping tools. Core drill openings through concrete work.
 - a. Comply with the requirements of applicable sections of Division 2 where cutting-and-patching requires excavating and backfilling.
- E. Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.
 - 1. Where feasible, inspect and test patched areas to demonstrate integrity of work.
- F. Restore exposed finishes of patched areas; and, where necessary extend finish restoration onto retained work adjoining, in a manner which will eliminate evidence of patching.
 - 1. Where patch occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing patch, after patched area has received prime and base coats.

3.3 CLEANING AND PROTECTION:

- A. General: During handling and installation of work at project site clean and protect work in progress and adjoining work on a basis of perpetual maintenance. Apply suitable protective covering on newly installed work where reasonably required to ensure freedom from damage or deterioration at time of substantial completion; otherwise, clean and perform maintenance on newly installed work as frequently as necessary through remainder of construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

- B. Limiting Exposures of Work: To extent possible through reasonable control and protection methods, supervise performance of work in a manner and by means which will ensure that none of the work whether completed or in progress, will be subjected to harmful, dangerous, damaging, to otherwise deleterious exposures during construction period. Such exposures include (where applicable, but not by way of limitation) static loading, dynamic loading, internal pressures, external pressures, high or low temperatures, thermal shock, high or low humidity, air contamination or pollution, water, ice, solvents, chemicals, light, radiation, puncture, abrasion, heavy traffic, soiling, bacteria, insect infestation, combustion, electrical current, high speed operation, improper lubrication, unusual wear, misuse, incompatible interface, destructive testing, misalignment, excessive weathering, unprotected storage, improper shipping/handling, theft and vandalism.

3.4 CONSERVATION AND SALVAGE:

- A. It is a general procedural requirement for supervision and administration of the work that construction operations be carried out with maximum practical consideration for conservation of energy, water and materials; and with maximum practical consideration for salvaging materials and equipment involved in performance of the work but not incorporated therein. Refer to other sections for required disposition of salvage materials and equipment which are Owner's property.

END OF SECTION

SECTION 01310

SCHEDULES, REPORTS AND PAYMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Bidding and Contract Requirements and Division 1 - General Requirements of the Specifications apply to this work.

1.2 SECTION INCLUDES:

- A. Administrative submittal requirements, including but not limited to:
 - 1. Bar chart progress schedule.
 - 2. Payment requests.

1.3 RELATED WORK:

- A. Coordinate the work of this section with work of other Sections as required to properly execute the Work, and as necessary to maintain satisfactory progress of the work of other Sections, including:
 - 1. Section 01010 - Summary of Work.
 - 2. Section 01700 - Contract Closeout.

1.4 PROGRESS SCHEDULE:

Coordination: Comply with General Conditions, Article VIII, paragraph 8.2. Coordinate both the listing and timing of reports and other activities required by provisions of this Section and other Sections, so as to provide consistency and logical coordination between the reports.

1.5 PAYMENT REQUESTS:

A. GENERAL:

Except as otherwise indicated, the progress payment cycle is to be regular. Each application must be consistent with previous applications and payments.

D. MONTHLY PAYMENT ESTIMATES:

Once each calendar month the A/E, General Contractor's superintendent, and Owner's Representative will have an on-the-job meeting in which to review the Contractor's estimate and to agree upon a percentage complete for the various items of work. The

Owner's Representative will review the estimate prior to presentation to the A/E for approval. The agreed upon percentage and the amount will be typed on the Contract breakdown schedule and signed by the General Contractor's representative and Owner's Representative.

1. Limitations - Estimate will not be approved if the job site As-Built drawings are not up to date and posted.
2. Historically Underutilized Business Progress Reports will be prepared and submitted with the pay request each month in accordance with Article V, paragraph 5.3.4 of the General Conditions. (TAMUS Form HUB1, see Section 01150.) Pay requests will not be approved without this completed form.
3. Contract Change Statement: All approved revisions should be entered on the Contract Change Statement, Form C-11 (See Section 01150). This statement will then be attached to the Contractor's monthly payment estimate. Percentages complete should be shown opposite each item listed and extended into the "Total Complete to Date" column. The total of the "Total Complete to Date" should be brought forward to the line item on the breakdown schedule titled, "Changes Complete to Date."
4. Payment for Stored Materials: Invoices for stored materials will be submitted when required by the Owner's Representative.

Stored materials invoices will be accepted only after an approved shop drawing or sample has been received by the Owner's Representative.

5. Payment of Estimates: It is the desire of the University, to process the Contractor's estimates as promptly as possible. In order to do this, it is requested that these instructions be followed and that the Contractor make every effort to see that the estimate is mathematically correct and that only approved items are included as material stored on the site.

Invoices for stored materials will only be considered when they exceed five hundred dollars (\$500) for each individual item. There will be no invoices accepted that contain tools, or expendable materials.

Invoices will only be considered that are referenced to the materials in the estimate cost breakdown. Invoices that are not legible will not be considered for payment.

All stored material will be checked by the Project Superintendent and verified by the Owner's Representative before being incorporated into the payment estimate.

- E. Base applications for Payment on value of work completed/removed.

- F. Final Payment Application: Administrative actions and submittals must precede or coincide with submittal of Contractor's final payment application.
1. Complete project closeout requirements specification in Section 01700.
 2. Additions and deductions resulting from (1) previous Change Orders, (2) deductions for re-inspection payments, and (3) other adjustments.
 - a. Original Contract Sum.
 - b. Additions and deductions resulting from (1) previous Change Orders, (2) deductions for re-inspection payments, and (3) other adjustments.
 - c. Retainage withheld from previous payments.
 - d. Total Contract Sum, as adjusted.
 - e. Previous Payments.
 - f. Sum remaining due.
 3. Architect will prepare final Change Order, reflecting approval adjustments to Contract Sum not previously made by Change Orders.
 4. Final payment constituting entire unpaid balance of Contract Sum will be made within 30 days after final Certificate of Payment has been approved.
- G. Application Transmittal: Submit three (3) executed copies of each payment application, one copy of which is completed with waivers of lien and similar attachments. Transmit each copy with a transmittal form listing those attachments, and recording appropriate information related to application in a manner acceptable to Owner. Transmit to Owner by means ensuring receipt within 24 hours.

1.6 ARCHITECT/ENGINEER REPORTS

- A. The A/E will make a monthly report to the Owner containing:
1. A brief synopsis of the work completed for this period; anticipated problems; and a review of the outstanding submittals and revisions.

A copy of this report shall be furnished to the General Contractor.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

Section 01310

Page 3 of 3

SECTION 01340

SUBMITTALS

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF REQUIREMENTS:

- B. The types of submittal requirements specified in this section include shop drawings, product data, samples and miscellaneous work-related submittals. Individual submittal requirements are specified in applicable sections for each unit of work. Refer to other Division 1 sections and other Contract Documents for requirements of administrative submittals.

1. Shop drawings include specially-prepared technical data for this project, including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements and similar information not in standard printed form for general application to a range of similar projects.
2. Product data include standard printed information on materials, products and systems; not specially-prepared for this project, other than the designation of selections from among available choices printed therein.
 - a. Samples include both fabricated and un-fabricated physical examples of materials, products and units of work; both as complete units and as smaller portions of units of work; either for limited visual inspection or (where indicated) for more detailed testing and analysis.
3. Miscellaneous submittals related directly to the work (non-administrative) include warranties, maintenance agreements, workmanship bonds, project photographs, survey data and reports, physical work records, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, operating and maintenance materials, overrun stock, and similar information, devices and materials applicable to the work and not processed as shop drawings, product data or samples.

1.3 GENERAL SUBMITTAL REQUIREMENTS:

- A. Scheduling: Where appropriate in required administrative submittals (listing of products, manufacturers, suppliers and subcontractors, and in job progress schedule),

show principal work-related submittals and time schedules for coordination of submittal activity with related work in each instance. Indicate submittal dates and review periods for major items of work on the project schedule.

- B. Coordination and Sequencing: Coordinate preparation and processing of submittals with performance of the work so that work will not be delayed by submittals. Coordinate and sequence different categories of submittals for same work, and for interfacing units of work, so that one will not be delayed for coordination of A/E's review with another.
- C. Preparation of Submittals: Provide permanent marking on each submittal to identify project, date, Contractor, subcontractor, submittal name, specification section number, and similar information to distinguish it from other submittals. Show contractor's executed review and approval marking and provide space for Architect's/Engineer's "Action" marking. Package each submittal appropriately for transmittal and handling. Submittals which are received from sources other than through Contractor's office will be returned by A/E "without action."
- D. Transmittal Form: AIA Form G810 or Contractor's standard form if approved by the Architect.

1.4 SPECIFIC-CATEGORY SUBMITTAL REQUIREMENTS:

- A. General: Except as otherwise indicated in individual work sections, comply with requirements specified herein for each indicated category of submittal. Provide and process intermediate submittals, where required between initial and final, similar to initial submittals.
- B. Owner's Records: Immediately following final approval of shop drawings and product data, the contractor shall transmit one copy of each item to the Owner for his records. The contractor shall also maintain a second copy of each item in his file for delivery to the Owner's user at the completion of the project. The second package shall include a copy of all shop drawings and product data submittals and shall include an index in the transmittal.
- C. Shop Drawings: Provide newly-prepared information, on reproducible sheets, with graphic information at accurate scale (except as otherwise indicated), with name of preparer indicated (firm name). Show dimensions and note which are based on field measurement. Identify materials and products in the work shown. Indicate compliance with standards, and special coordination requirements. Do not allow shop drawing copies without appropriate final "Action" markings by Architect/Engineer to be used in connection with the Work.
 - 1. Submittals: One correctable translucent reproducible print and one blue-line or black-line print; reproducible will be returned. Contractor shall obtain prints of the reproducible, marked "approved" for maintenance manuals, record documents, Owner's records, and other parties requiring copies.

- D. **Product Data:** Collect required data into one submittal for each unit of work or system; and mark each copy to show which choices and options are applicable to project. Include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked, and special coordination requirements. Maintain one set of product data (for each submittal) at project site, available for reference by Architect/Engineer and others.
1. **Submittals:** Do not submit products data, or allow its use on the project, until compliance with requirements of Contract Documents has been confirmed by Contractor. Submit seven (7) copies. The Architect shall retain one and return six copies. The Owner shall retain two copies and return the remaining four copies to the Contractor.
 - a. Provide a preliminary single-copy submittal where required (or desired by Contractor) for selection of options by Architect/Engineer.
 - b. **Installer's Copy:** Do not proceed with installation of materials, products or systems until final copy of applicable product data is in possession of Installer.
- E. **Samples:** Provide units identical with final condition of proposed materials or products for the Work. Include "range" samples (not less than 3 units) where unavoidable variations must be expected, and described or identify variations between units of each set. Provide full set of optional samples where Owner's selection is required. Prepare samples to match Owner's sample where so indicated. Include information with each sample to show generic description, source or product name and manufacturer, limitations, and compliance with standards. Samples are submitted for review and confirmation of color, pattern, texture and "kind" by Architect/Engineer and Owner. Samples must be submitted within five (5) days of Notice to Proceed.
1. **Submittal:** At Contractor's option, provide preliminary submittal of a single set of samples for Architect's/Engineer's review and "Action." Otherwise, initial submittal is final submittal unless returned with "Action" which requires re-submittal. Submit 2 sets of samples in final submittal; one set will be returned.
 2. **Quality Control Set:** Maintain returned final set of samples at project site, in suitable condition and available for quality control comparisons by Architect/Engineer, and by others.
- F. **Inspection and Test Reports:** Classify each as either "shop drawing" or "product data," depending upon whether report is uniquely prepared for project or a standard publication; process accordingly.
- G. **Warranties:** Refer to "Products" section for specific general requirements on warranties, product/workmanship bonds, and maintenance agreements. In addition

to copies desired for Contractor's use, furnish 2 executed copies. (Furnish four copies where required to be included in maintenance manual).

- H. Records of Actual Work: Furnish 4 copies, one of which will be returned for inclusion in "Record Documents" as specified in "Closeout" section.
- I. Closeout Submittals: Refer to individual work sections and to "closeout" section for specific requirements on submittal of closeout information, materials, tools and similar items.
 - 1. Record Document Copies: Furnish one set.
 - 2. Maintenance/Operating Manuals: Furnish 3 bound copies. One bound copy is to be furnished to the Owner within 7 days after completion of installation of the particular equipment. The remaining 2 bound copies are to be submitted at closeout of project.
 - 3. Materials and Tools: Refer to individual work sections for required quantities of spare parts, extra and overrun stock, maintenance tools and devices, keys, and similar physical units to be submitted.
 - 4. General Distribution: Provide additional distribution of submittals (not included in foregoing copy submittal requirements) to subcontractors, suppliers, fabricators, installers, governing authorities and other as necessary for proper performance of the work. Include such additional copies in transmittal to Architect/Engineer where required to receive "Action" marking before final distribution. Record distributions on transmittal forms.

1.5 ACTION OF SUBMITTALS:

- A. Architect's/Engineer's Action: Where action and return is required or requested, Architect/engineer will review each submittal, mark with "Action," and where possible return within 2 weeks of receipt. Where submittal must be held for coordination, Contractor will be so advised by A/E without delay.
 - 1. Final Unrestricted Release: Work may proceed, provided it complies with Contract Documents, when submittal is returned with the following:

Marking: "Approved" or "Accepted."
 - 2. Final-But-Restricted Release: Work may proceed, provided it complies with notations and corrections on submittal and with Contract Documents, when submittal is returned with the following:

Marking: "Approved as Noted" or "Accepted as Noted."

3. Returned for Re-submittal: Do not proceed with work. Revise submittal in accordance with notations thereon, and resubmit without delay to obtain a different action marking. Do not allow submittals with the following marking or unmarked submittals where a marking is required) to be used in connection with performance of the Work:

Marking: "Disapproved, Resubmit" or "Not Accepted, Resubmit."

4. Other Action: Where submittal is returned for other reasons, with Architect/Engineer's explanation included, it will be marked as follows:

Marking: "No Action."

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF REQUIREMENTS:

- A. Definitions: Specific administrative and procedural minimum actions are specified in this section, as extensions of provisions in General Conditions and other Contract Documents. These requirements have been included for special purposes as indicated. Nothing in this section is intended to limit types and amounts of temporary work required, and no omission from this section will be recognized as an indication by Architect or Engineer that such temporary activity is not required for successful completion of the work and compliance with requirements of Contract Documents. Provisions of this section are applicable to, but not by way of limitation,, utility services, construction facilities, security/protection provisions, and support facilities.

1.3 QUALITY ASSURANCE:

- A. General: In addition to compliance with governing regulations and rules/recommendations of franchised utility companies, comply with specific requirements indicated and with applicable local industry standards for construction work (published recommendations by local consensus "building councils").
- B. ANSI Standards: Comply with applicable provisions of ANSI A10-Series standards on construction safety, including A10.3, A10.4, A10.5, A10.6, A10.7, A10.8, A10.9, A10.10, A10.11, A10.12, A10.13, A10.14, A10.15, A10.17, A10.18, A10.20 and A10.22.
- C. NFPA Code: Comply with NFPA Code 241 "Building Construction and Demolition Operations."
- D. Environmental Impact Statement: Comply with provisions of Owner's committed EIS, for development and operation of temporary facilities and construction activities.
- E. Conservation: In compliance with Owner's policy on energy/materials conservation,

install and operate temporary facilities and perform construction activities in manner which reasonably will be conservative and avoid waste of energy and materials including water.

1.4 JOB CONDITIONS:

- A. General: Establish and initiate use of each temporary facility at time first reasonably required for proper performance of the work. Terminate use and remove facilities at earliest reasonable time, when no longer needed or when permanent facilities have, with authorized use, replaced the need.
- B. Conditions of Use: Install, operate, maintain and protect temporary facilities in a manner and at locations which will be safe, non-hazardous, sanitary and protective of persons and property, and free of deleterious effects.

PARTS 2 AND 3 - PRODUCTS AND EXECUTION

2.1 TEMPORARY UTILITY SERVICES:

- A. The types of services renovated include, but not by way of limitation, water, sewerage, electrical power and telephones. Comply with service companies' recommendations on materials and methods, or engage service companies to install services. Locate and relocate services (as necessary) to minimize interference with construction operations.

2.2 TEMPORARY CONSTRUCTION FACILITIES:

- A. The types of temporary construction facilities required, include, but not by way of limitation, enclosure of work, heat, ventilation, electrical power distribution, lighting, dust or noise partition. Provide facilities reasonably required to perform construction operations properly and adequately.
- B. Electrical Power: Contractor shall provide and pay for temporary power to site during construction.
- C. Lighting: Provide sufficient temporary lighting to ensure proper workmanship everywhere; by combined use of daylight, general lighting, and portable plug-in task lighting. Provide general lighting with local switching which will enable energy conservation during periods of varying activity (work-in-progress, traffic only, security check, lock-up, etc.)
- D. Access Provisions: Provide ramps, stairs, ladders and similar temporary access elements as reasonably required to perform the work and facilitate its inspection during installation. Comply with reasonable requests of governing authorities performing inspections. When permanent stairs are available for access during

construction, cover finished surfaces with sufficient protection to ensure freedom from damage and deterioration at time of substantial completion.

1. In areas of renovation within existing facilities, provide temporary ramps, doors, corridors, etc., as required to maintain fire exits as required by the authority having jurisdiction.

2.3 SECURITY/PROTECTION PROVISIONS:

- A. The types of temporary security and protection provisions required include, but not by way of limitation, barricades, and similar provisions intended to minimize property losses, personal injuries and claims for damages at project area.
- B. Storage of combustible and flammable materials shall be maintained outside of (and well detached from) the buildings. Storage of combustibles shall not be located inside the buildings.
- C. The supply of flammable paints, solvents, oils, gas cylinders, etc., inside the building shall be limited to that required for one day's use.
- D. Cutting and welding operations present a severe hazard, and such work should be done outside of the building whenever possible.
- E. No smoking is allowed within the construction area.
- F. All combustible waste and scrap materials shall be removed from the building on a daily basis. No "on-site" incineration shall be permitted.
- G. Ready access for the Public Fire Department shall be maintained to all areas.
- H. Temporary Interruption of Fire Protection System: The Contractor shall be responsible for implementing emergency measures that will maintain the integrity of fire protection during periods of impairment to such system.
 1. Notify the Project Manager and the local fire department, and that protection will be impaired. The information should include what systems will be out of service, for how long, and what areas will be affected.
 2. Temporary emergency measures that shall be implemented include continuous roaming fire watches, discontinue any work involving cutting or welding, laying out and charging fire hoses that can be put into operation immediately.
 3. Protection that is impaired should be restored as soon as possible, but should not be allowed to continue overnight or over a weekend or holiday period.

Once the work is started to correct the impairment, it should be continued until the work is complete and the system restored to service.

4. Advise all previously notified parties of the restoration of service at the first opportunity.

2.4 TEMPORARY SUPPORT FACILITIES:

- A. The types of temporary support facilities required include, but not by way of limitation, field offices, storage sheds, sanitary facilities, drinking water, first aid facilities, bulletin board, private telephones, clocks, project identification signs, clean-up facilities, waste disposal service, and similar miscellaneous general services, all as may be reasonably required for proficient performance of the work and accommodation of personnel at the site including Owner's and Architect's/Engineer's personnel. Discontinue and remove temporary support facilities, and make incidental similar use of permanent work of the project, only when and in manner authorized by Architect/Engineer; and, if not otherwise indicated, immediately before time of substantial completion. Locate temporary support facilities for convenience of users, and for minimum interference with construction activities.
- B. Contractor's Field Office: Provide adequate office space for field office personnel plus one spare work station for incidental use by subcontractor's personnel, suitably finished, furnished, equipped and conditioned.
 1. Provide a remote cordless telephone set or answering machine in the field office for the superintendent's use in making and receiving telephone calls when the office is not continuously staffed.

END OF SECTION

SECTION 01605

PRODUCTS AND SUBSTITUTIONS

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- C. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this Section.

1.2 DESCRIPTION OF REQUIREMENTS:

- A. Definitions: "Products" is defined to include purchased items for incorporation into the work, regardless of whether specifically purchased for project or taken from Contractor's stock of previously purchased products. "Materials," is defined as products which must be substantially cut, shaped, worked, mixed, finished, refined or otherwise fabricated, processed, installed or applied to form units of work. "Equipment" is defined as products with operational parts, regardless of whether motorized or manually operated, and particularly including products with service connections (wiring, piping, etc.). Definitions in this paragraph are not intended to negate the meaning of other terms used in contract documents, including "specialties," "systems," "structure," "finishes," "accessories," "furnishings," "special construction," and similar terms, which are self-explanatory and have recognized meanings in the construction industry.
- B. Substitutions: The requirements for substitutions do not apply to specified Contractor options on products and construction methods. Revisions to Contract documents, where requested by Architect or Engineer, are "changes" not "substitutions." Requested substitutions during bidding period, which have been accepted prior to Contract Date, are included in Contract Documents and are not subject to requirements for substitutions as specified herein. Contractor's determination of and compliance with governing regulations and orders issued by governing authorities do not constitute "substitutions;" and do not constitute a basis for change orders, except as provided for in Contract Documents. Otherwise, Contractor's requests for changes in products, materials and methods of construction required by Contract Documents are considered requests for "substitutions," and are subject to requirements hereof. This includes Contractor's proposal for approval of "or equal" products.
- C. Standards: Refer to Division 1 section "Definitions and Standards" for applicability of industry standards to products of project, and for acronyms used in text of specification sections.

1.3 QUALITY ASSURANCE:

- A. Source Limitations: To the greatest extent possible for each unit of work, provide products, materials and equipment of singular generic kind from a single source.
- B. Compatibility of Options: Where more than one choice is available as options for Contractor's selection of a product or material, select an option which is compatible with other products and materials already selected (which may have been from among options for those other products and materials). Total compatibility among options is not assured by limitations within contract documents, but must be provided by Contractor. Compatibility is a basic general requirement of product/material selections.
- C. Environmental Requirements: No product installed as part of or used for the construction of this project shall contain asbestos fiber. Material Safety Data Sheets (MSDS) shall be submitted for all products proposed to be installed as part of the work. Products containing polychlorinatedbiphenyls (PCB) shall not be installed in the project.

1.4 SUBMITTALS:

- A. Requests for Substitutions: Submit 3 copies, fully identified for product or method being replaced by substitution, including related specification section and drawing number(s), and fully documented to show compliance with requirements for substitutions. Include product data/drawings, description of methods, samples where applicable, Contractor's detailed comparison of significant qualities between specified item and proposed substitution, statement of effect on construction time and coordination with other affected work, cost information or proposal, and Contractor's statement to the effect that proposed substitutions will result in overall work equal-to-or-better-than work originally indicated.

1.5 PRODUCT DELIVERY-STORAGE-HANDLING:

- A. General: Deliver, handle and store products in accordance with manufacturer's recommendations and by methods and means which will prevent damage, deterioration, and loss including theft. Control delivery schedules to minimize long-term storage of products at site and overcrowding of construction spaces. In particular, provide delivery/installation coordination to ensure minimum holding or storage times for products recognized to be flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other sources of loss.

1.6 WARRANTIES (GUARANTEES):

- A. Categories of Specific Warranties: Warranties on the work are in several categories,

including those of General Conditions, and including (but not necessarily limited to) the following specific categories related to individual units of work specified in sections of Division 2 through 16 of these specifications:

1. Special Project Warranty (Guarantee): A warranty specifically written and signed by Contractor for a defined portion of the work; and, where required, countersigned by subcontractor, installer, manufacturer or other entity engaged by Contractor.
 2. Specified Product Warranty: A warranty which is required by Contract Documents, to be provided for a manufactured product incorporated into the work; regardless of whether manufacturer has published a similar warranty without regard for specific incorporation of product into the work, or has written and executed a special project warranty as a direct result of Contract Document requirements.
 3. Coincidental Product Warranty: A warranty which is not specifically required by Contract Documents (other than as specified in this Section); but which is available on a product incorporated into the work, by virtue of the fact that manufacturer of product has published warranty in connection with purchases and uses of product without regard for specific applications except as otherwise limited by terms of warranty.
- B. Refer to individual sections of Divisions 2 through 16 for the determination of units of work which are required to be specifically or individually warranted, and for the specific requirements and terms of those warranties (or guarantees).
- C. General Limitations: It is recognized that specific warranties are intended primarily to protect Owner against failure of the work to perform as required, and against deficient, defective and faulty materials and workmanship, regardless of sources. Except as otherwise indicated, specific warranties do not cover failures in the work which result from: 1) Unusual and abnormal phenomena of the elements, 2) The Owner's misuse, maltreatment or improper maintenance of the work, 3) Vandalism after time of substantial completion, or 4) Insurrection or acts of aggression including war.
- D. Related Damages and Losses: In connection with Contractor's correction of warranted work which has failed, remove and replace other work of project which has been damaged as a result of such failure, or must be removed and replaced to provide access for correction of warranted work.
1. Consequential Damages: Except as otherwise indicated or required by governing regulations, special project warranties and product warranties are not extended to cover damage to building contents (other than work of

Contract) which occurs as a result of failure of warranted work.

- E. Reinstatement of Warranty Period: Except as otherwise indicated, when work covered by a special project warranty or product warranty has failed and has been corrected by replacement or restoration, reinstate warranty by written endorsement for the following time period, starting on date of acceptance of replaced or restored work.
 - 1. A period of time equal to original warranty period of time.
- F. Replacement Cost, Obligations: Except as otherwise indicated, costs of replacing or restoring failing warranted units or products is Contractor's obligation, without regard for whether Owner has already benefited from use through a portion of anticipated useful service lives.
- G. Rejection of Warranties: Owner and Architect reserves the right, at time of substantial completion or thereafter, to reject coincidental product warranties submitted by Contractor, which in opinion of Owner and Architect tend to detract from or confuse interpretation of requirements of Contract Documents.
- H. Contractor's Procurement Obligations: Do not purchase, subcontract for, or allow others to purchase or sub-subcontract for materials or units of work for project where a special project warranty, specified project warranty, certification or similar commitment is required, until it has been determined that entities required to countersign such commitments are willing to do so.
- I. Specific Warranty Forms: Where a special project warranty (guarantee) or specified product warranty is required, prepare a written document to contain terms and appropriate identification, ready for execution by required parties. Submit draft to Owner (through Architect/Engineer) for approval prior to final executions.

PART 2 PRODUCTS

2.1 GENERAL PRODUCT COMPLIANCE:

- A. General: The compliance requirements, for individual products as indicated in Contract Documents, are multiple in nature and may include generic, descriptive, proprietary, performance, prescriptive, compliance with standards, compliance with codes, conformance with graphic details and other similar forms and methods of indicating requirements, all of which must be complied with. Also "allowances" and similar provisions of Contract Documents will have a bearing on selection process.
- B. Procedures for Selecting Products: Contractor's options for selecting products are limited by Contract Document requirements, and governing regulations, and are not controlled by industry traditions or procedures experienced by Contractor on

previous construction projects. Required procedures include, but are not necessarily limited to, the following for various indicated methods of specifying:

1. Single Product/Manufacturer Name: Provide product indicated, except advise Architect/Engineer before proceeding, where known that named product is not a feasible or acceptable selection.
2. Two or More Product/Manufacturer Names: Provide one of the name products, at Contractor's option; but excluding products which do not comply with requirements. Do not provide or offer to provide in the Base Bid an unnamed product, except where none of named products comply with requirements or are a feasible selection; advise Architect/ Engineer before proceeding.
3. "Or Equal": Where named products in specifications text are accompanied by the term "or equal", or other language of similar effect, comply with those Contract Document provisions concerning "substitutions" for obtaining Architect's/Engineer's approval (or change order) to provide an unnamed product. If a proposed "or equal" product is to be included in Base Bid, it must be approved in accordance with the Bidding documents prior to submitting Bids.
4. "Named" except as otherwise indicated, is defined to mean manufacturer's name for product, as recorded in published product literature, of latest issue as of date of Contract Documents. Refer requests to use products of a later (or earlier) model to Architect/Engineer for acceptance before proceeding.
5. Standards, Codes and Regulations: Where compliance with an imposed standard, code or regulations is required, selection from among products which comply with requirements including those standards, codes and regulations, is Contractor's option.
6. Performance Requirements: Provide products which comply with specific performances indicated, and which are recommended by manufacturer (in published product literature or by individual certification) for application indicated. Overall performance of a product is implied where product is specified with only certain specific performance requirements.
7. Prescriptive Requirements: Provide products which have been produced in accordance with prescriptive requirements, using specified ingredients and components, and complying with specified requirements for mixing, fabricating, curing, finishing, testing and similar operations in manufacturing process.
8. Visual Matching: Where matching of an established sample is required, final

judgment of whether a product proposed by Contractor matches sample satisfactorily is Owner's judgment. Where no product within specified cost category is available, which matches sample satisfactorily and complies with requirements, comply with Contract Document provisions concerning, "substitutions" and "change orders" for selection of a matching product outside established cost category or, of a product not complying with requirements.

9. Visual Selection: Except as otherwise indicated, where specified product requirements include "...as selected from manufacturer's standard colors, patterns, textures..." or words of similar effect, the selection of manufacturer and basic product (complying with requirements) is Contractor's option, and subsequent selection of color, pattern and texture is Owner's selection.

2.2 SUBSTITUTIONS:

- A. Conditions: Contractor's request for substitution will be received and considered when
extensive revisions to contract documents are not required and changes are in keeping with general intent of Contract Documents; when timely, fully documented and properly submitted; and when one or more of following conditions is satisfied, all as judged by Architect/Engineer. Otherwise, requests will be returned without action except to record non-compliance with these requirements.
 1. Where request is directly related to an "or equal" clause or other language of same effect in Contract Documents.
 2. Where required product, material or method cannot be provided within Contract Time, but not as a result of Contractor's failure to pursue the Work promptly or to coordinate various activities properly.
 3. Where required product, material or method cannot be provided in a manner which is compatible with other materials of the Work, or cannot be properly coordinated therewith, or cannot be warranted as required, or cannot be used without adversely affecting Owner's insurance coverage on completed work, or will encounter other substantial non-compliances which are not possible to otherwise overcome except by making requested substitution, which Contractor thereby certified to overcome such non-compatibility, non-coordination, non-warranty, non-insurability or other non-compliance as claimed.
 4. Where required product, material or method cannot receive required approval by a governing authority, and requested substitution can be so approved.

5. Where substantial advantage is offered Owner, in terms of cost, time, energy conservation or other valuable considerations, after deducting offsetting responsibilities Owner may be required to bear increased cost of other work by Owner or separate contractors, and similar considerations.
- B. Work-Related Submittals: Contractor's submittal of (and Architect's/Engineer's acceptance of) shop drawings, product data or samples which relate to work not complying with requirements of Contract Documents, does not constitute an acceptable or valid request for a substitution, nor approval thereof.

2.3 GENERAL PRODUCT REQUIREMENTS:

- A. General: Provide products which comply with requirements, and which are undamaged and unused by time of installation, and which are complete with accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for intended use and effect. Products of the same type shall be identical from the same manufacturer to provide uniform appearance, operation and maintenance.
1. Standard Products: Where available, provide standard products of types which have been produced and used previously and successfully on other projects and in similar applications.
 2. Continued Availability: Where additional amounts of a product, by nature of its application, are likely to be needed by Owner at a later date for maintenance and repair or replacement work, provide a standard, domestically produced product which is likely to be available to Owner at such later date.
- B. Nameplates: Except as otherwise indicated for required approval labels, and operating data, do not permanently attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view either in occupied spaces or on exterior of the work.
1. Labels: Locate required labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface which, in occupied spaces, is not conspicuous.
 2. Equipment Nameplates: Provide permanent nameplate on each item of service-connected or power operated equipment. Indicate manufacturer, product name, model number, serial number, capacity, speed, ratings and similar essential operating data. Locate nameplates on an easily accessed surface which, in occupied spaces, is not conspicuous.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Bidding and Contract Requirements and Division 1 - General Requirements of the Specifications apply to this Work.

1.2 SECTION INCLUDES:

- A. General requirements for closeout procedures, beneficial occupancy, final completion, final cleanup, closeout submittals, and application for final payment.

1.3 RELATED SECTIONS:

- A. Related Work of Other Sections:
 - 1. Section 01010 - Summary of Work.
 - 2. Section 01710 - Cleaning.
 - 3. Section 01720 - Project Record Documents.

1.4 CONTRACT CLOSEOUT PROCEDURES:

- A. Instruction of Using Personnel

The Contractor will provide demonstrations, conduct training and familiarization sessions for Physical Plant/User personnel on the mechanical and electrical systems in the facility prior to Final or Beneficial Occupancy Inspections. Arrangements for these instruction periods shall be made by the Owner's Representative. Operation and Maintenance Manuals must be available and used during this training period.

- B. Beneficial Occupancy: Refer to General Conditions, Article IX, "Beneficial Occupancy" for additional requirements.
 - 1. When Contractor considers the Work is sufficiently complete as defined in "Beneficial Occupancy," it shall submit to Architect a written notice that the Work, or designated portion thereof, is sufficiently complete for "Beneficial Occupancy" along with a list of items to be completed or corrected.
 - 2. Within a reasonable time after receipt of such notice, Owner, Architect and Engineer, as appropriate, will make an inspection to determine the status of completion.

3. Should A/E determine that Work is not sufficiently complete for "Beneficial Occupancy," A/E will promptly notify the Contractor and Owner's Representative in writing, giving reasons therefore.
 4. Contractor shall remedy the deficiencies in the Work, and send a second written notice to the Architect.
 5. Architect and Engineer, as appropriate, will re-inspect the Work.
 6. When Owner, Architect and Engineer concur that the Work is sufficiently complete as defined in "Beneficial Occupancy," the A/E will:
 - a. Prepare a Certificate of Beneficial Occupancy, accompanied by Contractor's list of items to be completed or corrected, as verified and amended by the Architect, Engineer and Owner.
 - b. Submit the Certificate to Owner and Contractor for their written acceptance of the responsibilities assigned to them in the Certificate.
 7. Failure to include any item in the "punch list" does not alter the responsibility of the Contractor to complete the Work in accordance with the Contract Documents.
 8. The A/E and Owner may review and amend the list of items to be completed or corrected and append the "punch list" of the Certificate of Beneficial Occupancy at any time before Contractor's final Notice of Completion.
- C. Pre-Final Completion: Refer to General Conditions, Article X, "Contract Final Acceptance." Those in attendance at final inspection may include the A/E, representatives of the Owner, Owner's User Coordinator, member from the Owner's Physical Plant and Contractor. Failure to satisfactorily complete items will necessitate further re-inspections by the A/E and other persons above. Perform and submit following prior to Pre-Final Inspection.
1. Before requesting pre-final inspection, Contractor shall review the Contract Documents and inspect the Work for compliance with the Contract Documents. Contractor shall make a thorough survey of work of all trades and ascertain that all final adjustments have been made and that the Work has been completed.
 - a. Test equipment and systems in the presence of the Owner's Representative and determined that equipment and systems are operational. Give necessary verbal instructions and demonstrations to maintenance forces for component parts of the building.
 - b. Furnish an updated list of Subcontractors and material suppliers along with names of key personnel, addresses and telephone numbers.
 - c. Deliver all Maintenance and Operating Manuals.
 - d. Deliver clean-up as specified in Section 01710.
 - e. Submitted required certified HVAC balancing and testing reports, when balancing and testing is specified as part of this Contract..

- f. Delivered packaged and labeled maintenance materials as required by the various specification Sections to a location within three miles of the Project Site as designated by Owner's Representative.
 - g. Deliver labeled keys and special tools to designated representative of Owner and secure a receipt. Master keys, safe combinations and similar sensitive items shall be mailed or delivered directly to Manager of Construction from hardware supplier.
 - h. Submit "Record Documents" to A/E as specified in Section 01720.
2. Upon receipt of notice of completion of Work and submittal of all required items from Contractor, Architect/Engineer and Owner's Representatives will make a pre-final inspection to determine status of completion, and prepare a punch list of items requiring completion or correction for use of the Contractor. If Architect/ Engineer or Owner's Representative do not concur in Contractor's claim of completion, Contractor will be notified, and Contractor shall send a second notice at an appropriate time of completion including a list of corrections made.

1.5 REINSPECTION FEES:

- A. Should status of completion of Work require re-inspection by Architect due to failure of Work to comply with Contractor's claims of completion, Owner will deduct the amount of Architect's compensation for re-inspection services from final payment to Contractor.

1.6 CLOSEOUT SUBMITTALS:

- A. Beneficial Occupancy: Submit list of items remaining to be completed or corrected and written notice of request for Beneficial Occupancy.
- B. Final Completion: Submit written request for Final Completion inspection and the following:
 - 1. Certification that work is complete and Owner has full access and use of completed work, Contract Documents have been reviewed, and systems and equipment have been tested and are operational.
 - 2. Copy of list of items to be completed or corrected from Beneficial Occupancy and Pre-Final Inspection, with each item initialed and showing date completed.
 - 3. Evidence of compliance with requirements of governing authorities:
 - a. Certificates of occupancy.
 - b. Certificates of final inspection for plumbing, mechanical, fire protection, electrical, and other systems required by governing authorities.

4. List of all subcontractors and material suppliers and product description. Provide name, address and phone number:
 - a. Product manufacturer.
 - b. Installer (subcontractor).
 - c. Local representative.
 - d. Local source of supply for parts and replacement.
5. Submit test/adjust/balance records; start-up performance reports, change over information germane to Owner's occupancy.
6. Clean-up: Refer to Section 01710 for requirements.
7. Deliver to Owner all special tools and keys in relation to project equipment and devices.
8. Instruction Logs for Instruction of Owner's Operating Personnel.
9. Warranties.
10. Keys, Keying Schedule, and Change Over of Locks: Refer to Section 08710 for requirements.
11. Space Parts and Maintenance Material.
12. Fully executed copies of following, in triplicate:
 - a. Contractor's Affidavit of Payment for Debts and Claims: On Owner provided document.
13. List of Contractor's incomplete work recognized as exceptions to Owner's Certificate of Final Acceptance.
14. Certificate of Insurance for Products and Completed Operations.

PART 2 - PRODUCTS

NOT USED.

PART 3 - EXECUTION

NOT USED.

END OF SECTION

SECTION 01710

CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- 1.1.1 Bidding and Contract Requirements and Division 1 - General Requirements of the Specifications apply to this work.

1.2 RELATED WORK:

1.2.1 Related Work of Other Sections:

- 1.2.1.1 Section 01010 - Summary of Work.
- 1.2.1.2 Section 01340 - Submittals.
- 1.2.1.3 Section 01500 - Temporary Facilities.
- 1.2.1.4 Section 01700 - Contract Closeout.

1.3 GENERAL REQUIREMENTS:

- 1.3.1 General: In addition to General Conditions, Article V, paragraph 5.16, provide progress and final cleaning as specified in this section.
- 1.3.2 Progress Cleaning: Keep premises and public properties free from accumulations of waste, debris and rubbish, caused by operations. Maintain Project in accord with State and local safety, health, and insurance standards.
- 1.3.3 Final Cleaning: At completion of Work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all exposed surfaces of building and Project Site; leave Project clean and ready for occupancy.
- 1.3.4 Pre-Final Inspection: Prior to pre-final inspection, clean all surfaces and remove all debris from project.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS:

- 2.1.1 Use materials which will not create hazards to health or property, and which will not damage surfaces.
- 2.1.2 Use only materials and methods recommended by manufacturer of material being cleaned.

PART 3 - EXECUTION

3.1 CLEANING:

- 3.1.1 In addition to removal of debris and cleaning specified in other sections, clean interior and exterior exposed-to-view surfaces affected by Work of this Contract.
- 3.1.2 Hazards Control: Store volatile waste in covered metal containers and remove from premises daily. Prevent accumulation of wastes which create hazardous conditions. provide adequate ventilation during use of volatile or noxious substances.
- 3.1.3 Clean permanent filters of ventilating equipment and replace disposable filters when units have been operated during construction; in addition, clean ducts, blowers, and coils when units have been operated without filters during construction.
- 3.1.4 Remove waste, debris, and surplus materials from site. Clean paving areas, walks, drive and streets in the vicinity of the building; remove mud, rubbish, waste, stains, spills, and foreign substances from paved areas and sweep clean. Immediately clean any mud tracked out of the construction area by vehicles and equipment.
- 3.1.5 Keep the entire construction area clean and at least weekly conduct a general clean-up operation.
- 3.1.6 Keep grass/weeds cut at all times within the limits of construction; maximum time interval in growing season is two weeks.
- 3.1.7 Do not burn or bury rubbish and waste materials on the Project Site.
- 3.1.8 Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
- 3.1.9 Do not dispose of excess concrete on the Project Site or adjacent property.
- 3.1.10 Wet down rubbish and waste to lay dust and prevent it from blowing.
- 3.1.11 Provide on Site containers for collection of waste, debris and rubbish. Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.
- 3.1.12 Remove temporary protection and labels not required to remain.
- 3.1.13 Just prior to painting and similar finishing operations, clean interior areas ready to receive finish, and continue cleaning on an as needed basis until building is ready for substantial occupancy.
- 3.1.14 Disposal: Remove waste materials, debris and rubbish from the Project Site and provide legal disposal at a Texas Department of Health (TDH) permitted solid waste

facility. In hauling material from the Project Site, Contractor shall prevent debris from dropping from vehicles and littering the site or area streets and roads. Contractor shall promptly remove any debris which falls from vehicles.

3.2 FINAL CLEANING

- 3.2.1 Employ experienced workmen or professional cleaners and perform cleaning in accordance with manufacturer's written recommendations, using products approved by the manufacturer for material being cleaned.
- 3.2.2 Prior to final inspection and the Owner's acceptance of the Work, perform final cleaning of all areas of the building and Project Site, performing all operations called for in the various Sections of Project Specifications. Final cleaning operations include, but are not limited to:
 - 3.2.2.1 Remove waste, debris, and surplus materials of any nature from site. Clean paving areas in the vicinity of the building; remove stains, spills, and foreign substances from paved areas and sweep paved areas clean and rake clean other surfaces of grounds.
 - 3.2.2.2 Broom cleaning of all exposed concrete floors.
 - 3.2.2.3 Cleaning all interior painted surfaces.
 - 3.2.2.4 Cleaning all exposed unpainted metals.
 - 3.2.2.5 Cleaning all architectural woodwork.
 - 3.2.2.6 Cleaning all doors and polish hardware; remove excess paint and stains.
 - 3.2.2.7 Cleaning all glass areas, exterior and interior. (In area of work.)
 - 3.2.2.8 Cleaning all storefront framing and doors, and glazed wall system members, exterior and interior. (In area of work.)
 - 3.2.2.9 Cleaning all walls and floors.
 - 3.2.2.10 Cleaning all resilient flooring and wax.
 - 3.2.2.11 Vacuuming all carpeted floors.
 - 3.2.2.12 Cleaning all toilet partitions, fixtures, and accessories.
 - 3.2.2.13 Cleaning all exposed surfaces of light fixtures, including removal of construction dust, paint over spray, finger prints, and similar soiling from light fixture bodies, reflectors, and both sides of light fixture lenses.
 - 3.2.2.14 Removing and disposing of all temporary protections.
 - 3.2.2.15 Repair, patch and touch-up marred surfaces to match adjacent surfaces.
 - 3.2.2.16 Prior to final completion, inspect exposed interior and exterior surfaces and work areas to verify that entire work is clean.
- 3.2.3 Clean finishes free of dust, stains, films, and other foreign substances.
- 3.2.4 Clean transparent and glossy materials to a polished condition; remove foreign substances. Polish reflective surfaces to a clear shine.

END OF SECTION

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Special Conditions and Division 1 specification sections, apply to work of this section.

1.2 RECORD DOCUMENT SUBMITTALS:

- A. General: Specific requirements for record documents are indicated in individual sections of these specifications. Other requirements are indicated in General Conditions. General submittal requirements are indicated in "Submittal" section. Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for Architect's/Engineer's reference during normal working hours.
- B. Record Drawings: Maintain a white-print set (blue-line or black-line) of contract drawings and shop drawings in clean, undamaged condition, with mark-up of actual installations which vary substantially from the work as originally shown. Mark whichever drawing is most capable of showing "field" condition fully and accurately; however, where shop drawings are used for mark-up, record a cross-reference at corresponding location on working drawings. Mark with red erasable pencil and, where feasible, use other colors to distinguish between variations in separate categories of work. Mark-up new information which is recognized to be of importance to Owner, but was for some reason not shown on either contract drawings or shop drawings. Give particular attention to concealed work, which would be difficult to measure and record at a later date. Note related change order numbers where applicable. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on cover of each set.
- C. Record Specifications: Maintain one copy of specifications, including addenda, change orders and similar modifications issued in printed form during construction, and mark-up variations (of substance) in actual work in comparison with text of specifications and modifications as issued. Give particular attention to substitutions, selection of options, and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation. Note related record drawing information and product data, where applicable. Upon completion of mark-up, submit to Architect/Engineer for Owner's records.

- D. Record Product Data: Maintain one copy of each product data submittal, and mark-up significant variations in actual work in comparison with submitted information. Include both variations in product as delivered to site, and variations from manufacturer's instructions and recommendations for installation. Give particular attention to concealed products and portions of the work which cannot otherwise be readily discerned at a later date by direct observation. Note related change orders and mark-up of record drawings and specifications. Upon completion of mark-up, submit complete set to Architect/Engineer for Owner's records.

- E. Miscellaneous Record Submittals: Refer to other sections of these specifications for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the work. Immediately prior to date(s) of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to Architect/Engineer for Owner's records.

END OF SECTION

SECTION 01740

WARRANTIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Bidding and Contract Requirements and Division 1 - General Requirements of the Specifications apply to this work.

1.02 SECTION INCLUDES:

- A. Provide preparation and submittal of warranties as specified in this Section.
- B. The Contractor is responsible for implementation of all warranties, guarantees, bonds, maintenance contracts and shall perform all work required, in case of failure of Subcontractors; material suppliers and manufacturers; applicators and installers; to fulfill an and all provision of the warranties, guarantees, service and maintenance contracts and bonds.
- C. General Contractor and installers shall sign warranties.

1.03 RELATED WORK:

- A. Related Work of Other Sections:
 - 1. General Conditions, Article XI - Contract Warranty and Guarantee.
 - 2. Section 01340 – Submittals/Shop Drawings, Product Data, Samples and Colors: Submittal schedule warranty requirements.
 - 3. Section 01700 - Contract Closeout.
 - 4. Individual Specification Sections: Special Project Warranties.

1.04 FORM OF WARRANTY SUBMITTALS:

- A. Warranty Format: Assemble warranties executed by respective manufacturers, suppliers, subcontractors and Contractor as follows:
 - 1. Size: 8-1/2" x 11". Punch sheets for 3-ring binder; fold larger sheets to fit into durable binders.
 - 2. Cover: Identify each packet with type or printed title "WARRANTIES." List title of Project and name of Contractor.
 - 3. Table of Contents: Neatly typed, using table of contents of Project Specification as format.
 - 4. Procedures to be followed in case of failure.

5. Quantity: Provide two (2) sets.
- B. Warranty Forms: Except as otherwise specified, Contractor shall execute in duplicate on Contractor's letterhead, the Project Warranty for General Construction and special Warranties required by various Specification Sections, on the warranty forms which follow at end of this Section.
- C. Warranty Effective Date:
 1. For portions of work accepted by Owner prior to Final Completion: Date of Beneficial Occupancy.
 2. For portions of work accepted by Owner at Final Completion; Date of Beneficial Occupancy or Final Completion whichever occurs sooner.

1.05 PREPARATION:

- A. Obtain warranties and guarantees, executed in duplicate by responsible subcontractors, suppliers and manufacturers within 10 days after completion of the applicable item or work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Beneficial Occupancy or Final Completion is determined in accordance with General Conditions, Paragraph 9.1.
- B. Verify that documents comply with requirements of Contract Documents, are in form approved by Owner, contain full information, and are notarized. As a minimum, each warranty shall contain:
 1. Name and location of Project.
 2. Name and address of Contractor.
 3. Product or work item.
 4. Scope of warranty.
 5. Date of beginning and duration of correction period for warranty.
- C. Retain warranties until time specified for submittal.

1.06 TIME OF SUBMITTALS:

- A. For equipment or component parts of equipment put into service with Owner's permission, submit documents within 10 days after acceptance.
- B. Make other submittals within 10 days after Date of Beneficial Occupancy, prior to Final Application for Payment.

1.07 SCHEDULE OF SUBMITTALS:

- A. Refer to Section 01340 for Schedule of Submittals.

1.08 WARRANTY ADMINISTRATION:

- A. A representative of the User (usually the Physical Plant Director) will be the Owner's point of contact for all warranty work. When disagreements develop between the Warranty Administrator and the Warrantor, the Director, Facilities Construction Division will act for the User.

PART 2 - PRODUCTS

NOT USED.

PART 3 - EXECUTION

NOT USED.

END OF SECTION

PROJECT WARRANTY FOR GENERAL CONSTRUCTION

WHEREAS, _____(Contractor),

Address _____

Telephone () _____ has performed general construction work on the following project:

For _____ (Owner),

Address _____, and,

WHEREAS, Contractor has agreed to warrant said work to be new, unless otherwise specified in the Contract Documents, and that all Work is of good quality, free from faults and defects, and in accordance with the Contract Documents.

NOW THEREFORE, Contractor hereby warrants said work in accordance with terms hereof, complying with terms of Contract with Owner dated _____, 20 ____, that:

Contractor agrees to repair or replace to the satisfaction of the Owner all work that may prove detective in workmanship or materials together with all other work which may be damaged or displaced in so doing, except for abuse, modifications not executed by Contractor, insufficient maintenance, improper operation, or normal wear and tear under normal usage.

All repairs or replacements shall have a correction period for such work equal to the original correction period as herein stated, dated from the final acceptance of repairs or replacement.

CORRECTION PERIOD FOR THE WORK: STARTING _____, TERMINATING _____.

In the event of our failure to comply with the above mentioned conditions within a reasonable time after being notified in writing, we hereby authorize the Owner to proceed to have defects repaired and made good at our expense, and will pay the costs and charges therefore immediately upon demand.

IN WITNESS THEREOF, this instrument has been duly executed this ____ day of _____, 20____.

for Contractor by _____.
(Signature)

_____ as its _____.
(Typed Name) (Position)

SPECIAL WARRANTY FOR _____

WHEREAS, _____(Contractor),

Address _____

Telephone () _____ has performed _____

work on the following project: _____

Address _____

For _____ (Owner),

Address _____, and,

WHEREAS, Contractor has agreed to warrant said work to be new, unless otherwise specified in the Contract Documents, and that all Work is of good quality, free from faults and defects, and in accordance with the Contract Documents.

NOW THEREFORE, Contractor hereby warrants said work in accordance with terms hereof, complying with terms of Contract with Owner dated _____, 20 ____, that:

Contractor agrees to repair or replace to the satisfaction of the Owner all work that may prove detective in workmanship or materials together with all other work which may be damaged or displaced in so doing, except for abuse, modifications not executed by Contractor, insufficient maintenance, improper operation, or normal wear and tear under normal usage.

All repairs or replacements shall have a correction period for such work equal to the original correction period as herein stated, dated from the final acceptance of repairs or replacement.

CORRECTION PERIOD FOR THE WORK: STARTING _____, TERMINATING _____.

In the event of our failure to comply with the above mentioned conditions within a reasonable time after being notified in writing, we hereby authorize the Owner to proceed to have defects repaired and made good at our expense, and will pay the costs and charges therefore immediately upon demand.

IN WITNESS THEREOF, this instrument has been duly executed this ____ day of _____, 20____.

for Contractor by _____.
(Signature)

_____ as its _____.
(Typed Name) (Position)

And has been countersigned in accordance with terms and conditions, for Installer by:

_____ (Signature) _____ (Typed Name)

as its _____.
(Position)

Name of Firm _____

Address _____

SECTION 06100

ROUGH CARPENTRY

PART 1 SCOPE

1.1 Furnish and install all rough carpentry as shown and specified.

PART 2 MATERIALS

2.1 The Contractor shall provide all the materials required for the rough carpentry; framing lumber, blocking bucks, etc., shall be No. 2 Southern Pine or equal, same to be treated as herein specified. All framing shall be selected for proper quality as appropriate for the particular use.

PART 3 DETAIL REQUIREMENTS

3.1 Unworked materials shall be suitably stored or stockpiled and protected.

3.2 Materials that are worked or in place shall also be protected during construction.

3.3 Care shall be exercised in the creation of all framing, anchoring, bolting, screwing, nailing, caulking, etc., to be according to the best practice and details.

3.4 Hardware

A. The Contractor shall provide all rough hardware including nails, screws, bolts, anchors, etc., as shown, and required for proper completion of the work. Reference shall be made as necessary to other sections of the specifications.

B. Items of rough hardware shall be galvanized, such as nails, screws, bolts, anchors, etc., as shown, and shall be of proper size and spacing for substantial construction. Generally, at least three nails shall be provided where good practice dictates. In case specific sizes and spacing are not shown for bolts, etc., they shall be provided according to best standard practice, as approved by the Architect.

3.5 Rough Framing

A. Provide and install all rough framing members, blocking, grounds, etc., shown and required for the completion of the work.

B. Erect all framing plumb, straight, level and in proper alignment.

C. Provide and install all grounds, nailers and blocking for attachment for other work.

D. All wood framing shall be installed with sufficient nails, spikes, and bolts to assure

rigidity. Where fasteners are not specifically shown, provide adequate fastenings per Architect's approval.

- E. All wood framing adjacent to concrete areas of project and in wet areas shall be treated wolmanized material, even though an asphalt felt may separate the two materials. Refer to plans for use in other areas of the project.

3.6 Preservative Treated Lumber

- A. Wood members requiring pressure - preservative shall be treated in accordance with FS TT-W-00571 and AWPB LP-Z. Each piece shall bear the AWPB stamp.
- B. The Contractor shall provide an affidavit signed by the preservative treatment company stipulating the moisture-retention obtained and certifying that for preservative-treated materials requiring paint or in contact with wood to be painted, the treated material conforms to the paint ability, drying time, and surface deposit requirements of FS TT-W-572.
- C. Fire Retardant Treatment: Where fire-retardant treated lumber or plywood is specified or otherwise indicated provide materials which comply with AWPA standards for pressure impregnation with fire-retardant chemicals, and which have a flame spread rating of not more than 25 when tested in accordance with UL Test 723 or ASTM E84, and show no increase in flame spread and significant progressive combustion upon continuation of test for additional 20 minutes.
 - 1. Use fire-retardant treatment which will not bleed through or adversely affect type of finish indicated and which does not require brush treatment of field-made end cuts to maintain fire-hazard classification.

3.7 Blocking and Nailers

- A. Nailing strips and blocking shall be continuous, cut with square ends and in maximum practical lengths.
- B. The bottom half of nailers shall be cut to provide a net open area equivalent to 10% of the edge face.

3.8 Wood Grounds

- A. Wood grounds shall be dressed, key beveled, preservative treated, not less than 1-1/2" wide, the required thickness to provide for that required.

END OF SECTION

SECTION 06200

FINISH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK:

- A. Definition: Finish carpentry includes carpentry work which is exposed to view, is non-structural, and which is not specified as part of other sections. Types of finish carpentry work in this section include:
 - 1. Interior running and standing trim.
- B. Rough carpentry is specified in Section 06100.
- C. Builders Hardware and wood doors are specified in sections within Division 8.

1.3 QUALITY ASSURANCE:

- A. Factory-mark each piece of lumber and plywood with type, grade, mill and grading agency identification; except omit marking from surfaces to receive transparent finish, and submit mill certificate that material has been inspected and graded in accordance with requirements if it cannot be marked on a concealed surface.

1.4 SUBMITTALS:

- A. Samples: Submit the following samples for each species and cut or pattern of finish carpentry.
 - 1. Standing and running trim, siding and paneling: One piece for boards and for each type of worked product (molding) required, 1'0" long x full board or molding width, finished on one side and one edge.
- B. Wood Treatment Data: Submit chemical treatment manufacturer's instructions for proper use of each type of treated material.
 - 1. Fire-Retardant Treatment: Include certification by treating plant treatment material complies with governing regulations, and treatment will not bleed through finished surfaces.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. Protect finish carpentry materials during transit, delivery, storage and handling to prevent damage, soiling and deterioration.
- B. Do not deliver finish carpentry materials, until painting, wet work, grinding and similar operations which could damage, soil or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, finish carpentry materials must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

1.6 JOB CONDITIONS:

- A. Conditioning: Installer shall advise Contractor of temperature and humidity requirements for finish carpentry installation areas. Do not install finish carpentry until required temperature and relative humidity have been stabilized and will be maintained in installation areas.
- B. Maintain temperature and humidity in installation areas as required to maintain moisture content of installed finish carpentry within a 1.0 percent tolerance of optimum moisture content, from date of installation through remainder of construction period. The fabricator of woodwork shall determine optimum moisture content and required temperature and humidity conditions.

PART 2 - PRODUCTS

2.1 WOOD PRODUCT QUALITY STANDARDS:

- A. Softwood Lumber Standards: Comply with PS 20 and with applicable grading rules of the respective grading and inspecting agency for the species and product indicated.
- B. Plywood Standard: Comply with PS 1 .
- C. Hardwood Lumber Standard: Comply with National Hardwood Lumber Association (NHLA) rules.
- D. Hardwood Plywood Standard: Comply with PS 51.
- E. Woodworking Standard: Where indicated for a specific product comply with specified provision of the following:
 - 1. Architectural Woodwork Institute (AWI) "Quality Standards".

F. Glued-Up Lumber Standard: Comply with PS 56.

2.2 MATERIALS:

A. General:

1. Nominal sizes are indicated, except as shown by detailed dimensions. Provide dressed or worked and dressed lumber, as applicable, manufactured to the actual sizes as required by PS 20 or to actual sizes and pattern as shown, unless otherwise indicated.
2. Moisture Content of Softwood Lumber: Provide kiln-dried (KD) lumber having a moisture content from time of manufacture until time of installation not greater than values required by the applicable grading rules of the respective grading and inspecting agency for the species and product indicated.
3. Moisture Content of Hardwood Lumber: Provide kiln-dried (KD) lumber having a moisture content from time of manufacture until time of installation within the ranges required in the referenced woodworking standard.
4. Lumber for Transparent Finish: Use pieces made of solid lumber stock.
5. Lumber for Painted Finish: At Contractor's option, use pieces which are either glued-up lumber or made of solid lumber stock.

B. Interior Finish Carpentry:

1. Standing and Running Trim for Transparent Finish: Plain Sawn Red Oak manufactured to sizes and patterns (profile) shown from selected First Grade Lumber (NHLA); complying with following grade requirements of referenced woodworking standard, for quality of materials and manufacture.
2. Standing and Running Trim for Painted Finish: Any Western species graded and inspected by WWPA complying with following requirements.
 - a. Grade for Standard Sizes and Patterns: "C Select" or "Choice" for Idaho White Pine.
 - b. Grade for Special (Custom) Sizes and Patterns: Premium for quality of materials and manufacture as required in referenced woodworking standard.

C. Miscellaneous Materials:

1. Fasteners and Anchorages: Provide nails, screws and other anchoring devices of the type, size, material and finish required for application indicated to provide secure attachment, concealed where possible, and complying with applicable Federal Specifications.

2.3 WOOD TREATMENT:

A. Fire-Retardant Treated Wood:

1. Where fire-retardant treated wood is indicated provide lumber and plywood which complies with AWPA standards for pressure impregnation with fire-retardant chemicals and has the following fire-hazard classification:
2. Numerical ratings of not more than 25 for flame spread, smoke developed, and fuel contributed when tested in accordance with UL 723 or ASTM E 84, with no increase in flame spread and evidence of significant progressive combustion upon continuation of test for additional 20 minutes.
3. Use fire-retardant treatment which will not bleed through or adversely affect type of finish indicated for finish carpentry and which does not normally require field-applied brush treatment after fabrication to maintain fire hazard classification.
4. Where transparent finish is indicated use a fire-retardant treatment which permits milling of lumber after treatment and kiln-drying without altering indicated fire-hazard classification, as determined by fire testing.
5. Kiln-dry treated wood to a maximum moisture content of 15% after treatment.
6. Inspect each piece of lumber and plywood or each unit of finish carpentry after drying; do not use twisted, warped, bowed or otherwise damaged or defective wood.

PART 3 - EXECUTION

3.1 PREPARATION:

- A. Condition wood materials to average prevailing humidity conditions in installation areas prior to installing.
- B. Backprime lumber for painted finish exposed on the exterior or, where indicated, to moisture and high relative humidities on the interior. Comply with requirements of section on painting within Division 9 for primers and their application.

- C. Pre-Installation Meeting: Meet at project site prior to delivery of finish carpentry materials and review coordination and environmental controls required for proper installation and ambient conditioning in areas to receive work. Include in meeting the Contractor, Architect and other Owner Representatives, Installers of finish carpentry, wet work including plastering, other finishes, painting, mechanical work and electrical work, and firms and persons responsible for continued operation (whether temporary or permanent) of HVAC system as required to maintain temperature and humidity conditions. Proceed with finish carpentry on interior only when everyone concerned agrees that required ambient conditions can be properly maintained.

3.2 INSTALLATION:

- A. Discard units of material which are unsound, warped, bowed twisted, improperly treated, not adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements, or which are of defective manufacture with respect to surfaces, sizes or patterns.
- B. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level countertops; and with 1/16" maximum offset in flush adjoining 1/8" maximum offsets in revealed adjoining surfaces.
- C. Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.
- D. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Code at returns, miter at corners, to produce tight fitting joints with full surface contact throughout length of joint. Use scarf joints for end-to-end joints.
- E. Fire-Retardant Treated Wood: Handle, store and install in accordance with manufacturer's directions and as required to meet required classification or rating. Provide special fasteners, moldings, adhesives and other accessories as tested and listed for type of fire-retardant materials indicated.
- F. Anchor finish carpentry work to anchorage devices or blocking built-in directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where pre-finished matching fasteners heads are required, use fine finishing nail for exposed nailings, countersunk and filled flush with finished surface, and matching final finish where transparent is indicated.

3.3 ADJUSTMENT, CLEANING, FINISHING AND PROTECTION:

- A. Repair damaged and defective finish carpentry work wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace woodwork. Adjust joinery for uniform appearance.
- B. Refer to Division 9 sections for final finishing of installed finish carpentry work.
- C. Protection: Installer of finish carpentry work shall advise Contractor of final protection and maintained conditions necessary to ensure that work will be without damage or deterioration at time of acceptance.

END OF SECTION

SECTION 06400

ARCHITECTURAL WOODWORK

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the architectural woodwork as shown on the drawings and/or specified herein, including but not limited to, the following:
 1. Wood veneer on plywood paneling.
 2. Wood rails, caps and trim pieces.
 3. Laminated solid wood rails, caps, and trim pieces.
 4. Plywood casework and counters with plastic laminate finish.
 5. Hardware for casework.
 6. Wood framing and rough lumber as required for work of this Section.
 7. Wood grounds, blocking, nailers, furring as required for work of this Section.
 8. All rough hardware and fastenings for work of this Section.
 9. Drilling concrete and masonry, drilling and/or tapping metal work, as required, for the installation of work of this Section.
 10. Back painting as specified herein.
 11. Shop finish of work of this Section, except items indicated herein to be shop primed only.

1.3 RELATED SECTIONS

- A. Rough Carpentry - Section 06100.
- B. Painting - Section 09900.

1.4 QUALITY STANDARDS

- A. The quality standards of the Architectural Woodwork Institute, latest edition, shall apply to all workmanship for architectural woodwork and by reference are made a part of this specification. All work shall conform to “Premium” grade requirements of the AWI Quality Standards, unless otherwise modified herein.
- B. In the event of a dispute as to the quality grade (or grades), all parties involved will (1) call upon the Architectural Woodwork Institute for an inspection under AWI’s established inspection procedures, and (2) agree to abide by the decision of AWI. The cost of said inspection shall be borne by the Contractor.
- C. Employ only tradesmen experienced in the fabrication and installation of architectural woodwork.

1.5 SUBMITTALS

A. Shop Drawings

- 1. Submit shop drawings of all woodwork specified and indicated on the drawings. Shop drawings shall indicate room plans and elevations at 3/4” equals 1’-0” scale and typical construction details at 3” equals 1’-0” scale. Shop drawings shall indicate all materials, thicknesses and finishes.
- 2. Shop drawings shall show all finish hardware, anchors, fastenings and accessories.
- 3. Shop drawings shall show all jointing, joint treatment and butt jointing in veneers and plastic laminate.
- 4. Shop drawings for wood paneling must show complete elevations of rooms to receive paneling as well as panel matching required by these specifications.

B. Samples: Submit samples of each of the following items:

- 1. Plastic laminate, twelve (12) inches square, including a section of outside corner.
- 2. Transparent finish for each specie of wood veneer laminated to particle board, twelve (12) inches square, for each finish specified or shown.
- 3. Each finish type of wood panel, 24” wide x 36” high.
- 4. Each type and finish of each type of wood trim, caps, etc., twelve (12) inches long, finish as specified.
- 5. Cabinet hardware. See Part 2, Section 2.8 for additional information.

1.6 QUALIFICATIONS

- A. The work of this Section shall be provided by a firm having a minimum of five (5) years experience on projects of similar size and quality to that specified and shown.

1.7 COORDINATION

- A. Coordinate the work of this Section with other appropriate Sections of the specifications to insure proper scheduling for fabrication and installation of the work specified herein
- B. Coordinate with partition and finish trades to insure that proper provisions are made for the installation of the work specified herein.
- C. Verify all dimensions in the field prior to fabrication of all Architectural Woodwork to assure proper fit.

1.8 PRODUCT HANDLING

- A. All materials and work of this Section shall be protected from damage, from time of shipment from shop to final acceptance of work. Cover, ventilate, and protect work of this Section from damage caused by weather, moisture, heat, staining, dirt, abrasions, any other causes which may adversely affect appearance of use, or which may cause deterioration of finish, warping, distortion, twisting, opening of joints and seams, delamination, loosening, etc., of work of this Section.
- B. Keep all finish carpentry, millwork, and cabinet work under cover both in transit and at the premises. Do not deliver any finish carpentry, millwork or cabinet work before it is required for installation. Protect such work to avoid damage in transit, during erection and after erection until acceptance of the building; use all such methods to provide the proper protection. Remove such protection when directed by the Architect.
- C. Deliver finish carpentry, millwork, and cabinet work in a dry stable condition; protect same against injury and dampness. Do not store or install finish carpentry, millwork or cabinet work until after the concrete, masonry and plaster work are thoroughly dry.
- D. Damaged or defective items or work of this Section are subject to rejection and replacement with new by Contractor, at no cost to Owner.

1.9 JOB CONDITIONS

- A. Humidity and Temperature Controls: Advise Contractor of requirements for maintaining heating, cooling and ventilation in installation areas as required to

reach relative humidity necessary to maintain optimum moisture content specified for woodwork.

- B. Determine equilibrium moisture content and maintain required temperature and relative humidity as required for a tolerance of plus or minus one (1) percent of the specified optimum moisture content until woodwork receives specified finishes. Refer to “Guide to Wood Species Selection”, AWI, for method of determining equilibrium moisture content values.
- C. Examination of Substrate and Conditions: The installer must examine the substrate and the conditions under which the work of this Section is to be performed, and notify the Contractor in writing of unsatisfactory conditions. Do not proceed with work under this Section until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

PART 2 PRODUCTS

2.1 BASIC REQUIREMENTS

- A. Wood Moisture Content: Provide kiln-dried (KD) lumber with an average moisture content range of nine (9) to twelve (12) percent for exterior work and six (6) to eleven (11) percent for interior work. Maintain temperature and relative humidity during fabrication, storage and finishing operations so that moisture content values for woodwork at time of installation do not exceed seven (7) percent.
- B. Measurements: Before proceeding with woodwork required to be fitted to other construction, obtain field measurements and verify all dimensions of shop drawing details as required for accurate fit.
- C. Compatibility of Grain and Color: Architect reserves the right to select materials for best compatibility between visually related members and veneers.
- D. Machine and sand woodwork to comply with requirements of Standards for specified grade.
- E. Fabricate woodwork to dimensions, profiles and details shown. Route or groove back of flat trim members, kerf backs of other wide flat members except plywood or veneered members.
- F. Miter joints by joining, splining and gluing to comply with requirements for the specified grade.
- G. Inspect each piece of lumber and plywood or each unit of woodwork after drying; do not use twisted, warped, bowed or otherwise damaged or defective wood.

2.2 GENERAL - MATERIALS

- A. Softwood lumber shall conform to the requirements of the latest edition of American Lumber Standards Simplified Practice Recommendation R-16. Grades shall conform to the grading rules of the Association having jurisdiction, and shall bear the official grade and trademark of the Inspection Bureau of the Association and a mark of mill identification.
- B. Framing and Rough Lumber: No. 1 KD grade Southern Pine or Dense Construction grade Douglas Fir, having extreme fiber in bending stress of at least 1700 psi, surfaced four sides (S4S). Provide fire retardant treatment meeting requirements of Section 06200.
- C. Grounds, Blocking, Nailers, Furring: Southern Pine, Douglas Fir or Sitka Spruce, grade to suit particular purpose and to be straight, square edged, straight grained, surfaced four sides (S4S), and which will retain nails and screws without splitting. Provide fire retardant treatment.
- D. Plywood: AWI Section 200; Veneer core, particle or plywood core unless otherwise specified, and with the following requirements:
 - 1. Hardwood: Premium Grade, Section 200, face veneers as shown or specified
 - 2. Particle Board: Premium Grade, Section 200, fire retardant for wall paneling only equal to Duraflake FR and Duraflake for cabinets.
 - 3. Edges: Banded with hardwood in accordance with Premium Grade Standards.

2.3 PLASTIC LAMINATE

- A. Face Sheets: NEMA Publication LD3, Grade GP50, Type I, 0.05” thick, as manufactured by Formica, Nevamar, Wilson-Art.
- B. Backing Sheets: Non-decorative, high pressure plastic laminate, NEMA LD3, Grade BK20, 0.02” thick.
- C. Edges: Finish with plastic laminate to match face and applied before face sheets are applied, unless otherwise shown or specified.

2.4 METAL

- A. Steel
 - 1. Structural Steel Shapes and Plates: ASTM A36.

2. Hot-Rolled Carbon Steel Sheets: Commercial quality, ASTM A569, may be used for concealed parts only. Galvanize sheets for planters.
3. Finishes
 - a. Primer for Unexposed Metal: Zinc chromate primer.

2.5 MISCELLANEOUS PRODUCTS

A. Fasteners

1. Wood Screws: FS FF-S-111, type, size, material and finish as required for the condition of use.
2. Nails: FS FF-N-105, type, size, material and finish as required for the condition of use.
3. Anchors: Type, size, material and finish as required for the condition of use.
4. Staples: Upholstery type staples of sufficient strength to hold fabric taut in place without sagging.

B. Adhesives

1. For Laminating Plastic Laminate Surfaces: Melamine, phenol-resin, or resorcinol-resin complying with FS MMM-A-181; type, grade and best suited for the purpose.
2. For All Other Uses: Moisture resistant complying with FS MMM-A125, Type II, or MMM-A-188, Type I II or III.

2.6 CABINETS WITH PLASTIC LAMINATE FINISH

A. General

1. Fabricate all cabinetry and millwork to the "Premium Grade" standards of the AWI, Section 400.
2. Face construction of cabinets shall be "Flush Overlay".
3. Provide 3/4" thick doors, drawer fronts and fixed panels (including thickness of plastic) except where required to be thicker by Standards; and provide flush units.
4. Provide dust panels of 1/4" thick plywood or tempered hardboard above compartments and drawers, except where located directly below counter tops.

5. Exposed Edges: Plastic laminate matching exposed panel surfaces. Ease exposed edge of overlap sheet.
- B. Plastic Laminate
1. Plastic Laminate for Horizontal Surfaces: 0.050" thick, general purpose type (high pressure).
 2. Plastic Laminate for External Vertical Surfaces: 0.028" thick, general purpose type (high pressure).
 3. Plastic Laminate for Post Forming: 0.042" thick, post forming (high pressure).
 4. Plastic Laminate for Cabinet Linings: 0.020" thick, cabinet liner (high pressure).
 5. Plastic Laminate for Concealed Panel Backing: 0.020" thick, backer type (high pressure).
 6. Plastic Laminate Colors and Patterns: As selected by the Architect from manufacturer's standard satin finish products. Acceptable manufacturer's: Wilson-Art, Nevamar, Formica.
- C. Shop Assembly: All work shall be shop assembled. Work that is too large for entrance into the use area shall be fabricated in attachable sections with provisions for reconnection in the using space.
- D. Material Thicknesses: See drawings for general materials thicknesses. Minimum thickness of solid lumber for web frames, trim, bases, etc., shall be 3/4". Minimum thickness of plywood and particleboard shall be 3/4".
- E. Sizes: See drawings for woodwork sizes required. The manufacturer shall check field dimensions and verify all openings and actual field conditions prior to fabrication of work.
- F. Manufacturer is responsible for rigidity and structural stability.
- 2.7 PLASTIC LAMINATE COUNTERTOPS AND VANITIES
- A. Grade: Same as AWI grade required for cabinet work; plastic laminate finish.
- B. Construction
1. Provide back-splash and end-splash, where detailed; top-mounted square butt joint, fully covered with matching plastic laminate, eased edges.
 2. Exposed Counter Edges: Plastic laminate matching surface, except as otherwise indicated. Ease exposed edges of overlap sheet.

3. Cut openings for equipment to be installed. Comply with equipment manufacturer's requirements, but provide internal corners of 1/8" minimum radius. Smooth saw cut and ease edges.
4. Seal cut edges of counter at openings for sinks and other "wet" equipment, using waterproofing compound recommended by plastic manufacturer and compatible with laminating adhesive.

2.8 CABINET HARDWARE

- A. Architectural Woodwork Hardware: Provide the following items, or their approved equal, as required:
 1. Hinges: Hafele concealed hinges.
 2. Catches: Magnetic; top and bottom.
 3. Pulls: Selected by the Architect.
 4. Locks: National disc tumbler cam locks.
 5. Drawer Slides: Accuride, Model 7434, full extension, 100 lb. capacity.
 6. Shelf Supports: Pin and grommet system equal to No. 282.01.701 pin and 282.50.704 grommet made by Hafele.
 7. Finish: Selected by Architect.
 8. Closet Hardware: Oval wardrobe rails, chrome plated steel with center bracket and wall support brackets made by Hafele or approved equal.

2.9 WOOD FOR RAILS, CAPS, AND TRIM

- A. Quality Standard: For the following types of interior architectural woodwork, comply with indicated standards as applicable.
 1. Standing and Running Trim: AWI Section 300.
 2. Miscellaneous Millwork: AWI Section 700.
- B. Woodwork for Paint Finish: Except as otherwise indicated, comply with the following:
 1. Grade: Premium.
 2. Species of Solid Wood: Solid, paint grade, sound clear Poplar.

2.10 FABRICATION - GENERAL

- A. Provide lumber framing for architectural woodwork, complete with all bracing and fastening devices as required for a rigid installation, and as required to sustain the imposed loads.
- B. Do all fabrication from field measurement with provision for scribing as required to meet built-in conditions.
- C. Coordinate the work of this Section with the work of other trades.
- D. Fabricate units in largest practicable sections. Assemble in the shop for trial fit, disassemble for shipment and reassemble with concealed fasteners.
- E. Maintain relative humidity and temperature during fabrication, storage and finishing operations matching that of the areas of installation.
- F. Details indicate the required type and quality of construction. Modifications to conform to manufacturer's standards will be considered providing they comply with the Contract Documents, maintain the profiles shown and subject to acceptance by the Architect.
- G. Reinforcing shown is minimum. Provide additional reinforcing as required to ensure a rigid assembly. Exposed surfaces shall be free from dents, tool marks, warpage, buckle, glue and open joints, or other defects affecting serviceability or appearance. Accurately fit all joints, corners and miters. Conceal all fasteners. Make threaded connections up tight so that threads are entirely concealed.
- H. Factory finish all items where possible. Defer final touch-up, cleaning and polishing until after delivery and installation.
- I. Comply with AWI Section 1500, Premium Grade for sanding, filling countersunk fasteners, back priming and similar preparations for the finishing of architectural woodwork, as applicable to each unit of work.
- J. Prepare all countersunk wood screw attachments for wood plugs. Wood plugs shall match surrounding species and grain direction, putty filling is not acceptable.

2.11 FABRICATION - SPECIFIC ITEMS

- A. Casework
 - 1. Provide casework in accordance with AWI Section 400, Premium Grade.

2. Include all preparations for mechanical, electrical, telephone and plumbing work required.
 3. Provide cabinet hardware for casework as shown.
 4. Provide dust panels in body webs and between drawer units.
 5. Hollow core doors will not be permitted.
 6. Provide drawers with slides as specified. Drawers shall not rest on web body frames.
- B. Closet and Storage Shelving
1. Provide closet and storage shelving in accordance with AWI Section 600, Custom Grade, unless otherwise shown or specified.
 2. Exposed edges shall have hardwood edge bands.
- C. Standing and Running Trim
1. Provide standing and running trim of the sizes, profiles, species and finish as specified or shown and complying with AWI Section 300, Premium Grade.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where architectural woodwork is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 FRAMING

- A. Use specified framing lumber, sizes and spacing as indicated on drawings and as required to support loads.
- B. Framing shall be cut square on bearings, closely fitted, accurately set to required lines and levels, rigidly secured in place at bearings and connection with nails, lag screws and/or bolts as required by conditions.

3.3 GROUNDS, BLOCKING, NAILERS AND FURRING

- A. Provide all wood grounds, blocking, nailers, furring, and the like for work of this Section, where shown and where required, dressed to size indicated or required to suit the condition. Install grounds, blocking, nailers, furring, etc., rigidly, in proper alignment, trued with a long straight edge.

3.4 ROUGH HARDWARE

- A. Provide all rough hardware, such as nails, screws, bolts, anchors, hangers, clips and similar items. Hardware shall be of the proper size and kind to adequately secure the work together and in place, in a rigid and substantial manner. Use galvanized hardware at exterior walls, and at other locations where subject to moisture or where water will be present.
- B. Secure wood to concrete and to solid masonry with countersunk bolts in expansion sleeves or other approved manner, to steel with countersunk bolts, to hollow masonry and to drywall with heavy duty countersunk toggle bolts. Space fastenings not more than sixteen (16) inches apart. Hardened cut nails, power-driven fastenings, or other suitable devices may be used where approved by the Architect.
- C. Connections and fastenings shall be made in such manner as will compensate for swelling and shrinkage and shall permit the work to remain permanently in place without any splitting or opening of joints.

3.5 INSTALLATION OF CABINET FINISH HARDWARE

- A. All items of finish hardware furnished under this Section shall be carefully fitted and secured in place as part of the work of this Section. Locations and positioning of hardware shall be subject to the Architect's approval. Care shall be taken not to mar or damage hardware, or other work. Install doors plumb and true. Hardware shall be fitted to assure operation without forcing.
- B. After preliminary fitting of hardware, the Contractor shall remove trim for painting and finishing work; after which he shall reinstall the hardware in a permanent manner.
- C. Upon completion of the work, before final acceptance of the building by the Owner, the Contractor shall, in the presence of the Architect, show that all hardware is in satisfactory working order; fit all keys in their respective locks and, upon acceptance of the work, shall tag and deliver all keys to the Architect and Owner.
- D. When directed by the Owner, at any time during the first year after the completion of the Contract, the Contractor shall return to the building and adjust and refit the work and hardware, and leave such items in satisfactory working order.

3.6 GENERAL INSTALLATION

- A. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb

and level (including countertops), and with 1/16" maximum offset in flush adjoining surfaces, 1/8" maximum offset in revealed adjoining surfaces.

- B. Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.
- C. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation.

3.7 TRIM, MOULDINGS, ETC.

- A. Install with minimum number of joints possible, using full length pieces for each run. Stagger joints in adjacent and related members. Cope at returns, miter corner.
- B. Joints of all trim and/or moldings shall be set tight, miter exterior angles and cope interior angles. Joints, except end joints less than twelve (12) feet apart, will not be permitted in straight runs of trim and/or moldings and rails.
- C. Secure all trim and/or moldings with glue and blind nail with finishing nails. Set exposed nail heads in finished work and putty. Sand all work to remove any tool marks and irregularities.
- D. Wood shall receive finish as specified in Section 09900 - Painting.

3.8 CABINET WORK AND MILLWORK

- A. General
 - 1. Materials and workmanship shall conform to the Quality Standards of the Architectural Woodwork Institute specified herein and to the drawings.
 - 2. Cabinet work and millwork shall be performed by experienced cabinet work and millwork company, having craftsmen skilled in their trade.
 - 3. Fabricate all cabinet work and millwork completely in the shop, in complete and/or as large units as practical, leaving only fitting, assembly, installation and a minimum of fabrication and finishing to be done at the building. Assembled work shall be rigidly secured and permanently fastened together with concealed fasteners.
 - 4. Afford Architect every facility for inspection of work at shop or mill at such times as the Architect may select.
 - 5. As far as practicable, use concealed fastenings for joining and assembling the work. Where this is impossible, the means of securing shall be placed in inconspicuous places and methods of joining and assembling submitted for Architect's approval prior to fabrication.

6. Mill all finish wood accurately to detail, with clean cut moldings, profiles and lines, machined, sanded smooth, housed, jointed, blocked, put together in the best manner, with provision for swelling and shrinkage, and to assure the work remaining in place without warping, splitting or opening of joints.
 7. Cut trim to dimensions and profiles shown, from solid stock.
 8. Make all trim and the like in single lengths wherever possible; joints mitered, glued and splined. Continuous members shall have tight flush joints, doweled or splined and glued.
 9. Make all joints hairline tight, fitted accurately and joined with hardwood splines or dowels, glued together, or by other method approved by Architect. Use screws, not nails, for fastenings.
 10. Gluing shall, where practicable, be by the hot plate press method and glued surfaces shall be in close contact throughout. Glue stains on finished work will not be permitted.
 11. Cover surface fastenings, where permitted, with matching wood plugs or wood putty. Finish exposed edges of plywood with matching solid stock. Lock miter external corners; tongue and groove internal corners to allow for contraction and expansion.
 12. Machine sand with grain, finish with hand sanding, leave exposed surfaces free from machine or tool marks that will show through the finish.
 13. Work which adjoins drywall, concrete, or other finish shall be fitted and scribed in a careful manner and ample allowance shall be given for cutting and scribing.
 14. Erect work true to lines, levels and dimensions, square, aligned and plumb, securely and rigidly fastened in place.
- B. Cabinet Work: Provide all items of cabinet work indicated on drawings and as herein specified.
1. Tops, sides, backs, bottoms, dividers, shelves, fronts, doors and drawer fronts shall be of plywood or flakeboard core, with the specified wood veneer or plastic laminate as indicated on drawings.
 2. Drawer sides and backs shall be 1/2" thick solid clear selected white birch, suitable for clear finish. Drawer bottom shall be 3/8" thick plywood with clear selected white birch veneers, suitable for clear finish.
 3. Cabinet doors and drawers shall be flush mounted.
 4. Adjustable shelves in cabinets shall have grommets spaced 2" o.c.

5. Fixed shelves shall be dadoed into side supports and glued.
6. Shelves shall be 3/4" thick for spans up to 30"; for spans in excess of 30" to 48" shelves shall be 1" thick.
7. All cabinets shall have closed top, sides, bottom, and back with veneers to match face work. Cabinets to fit accurately into indicated locations; scribe moldings permitted only where indicated.
8. Countertops, counters, counter fronts, shelves, etc., indicated on drawings to have plastic laminate, shall have plastic laminate shop applied to 3/4" thick core, with plastic laminate backing sheet on underside or back of countertops, counters and shelves. Plastic laminate shall be pressure laminated to core with laminate at external corners. Provide concealed wood framing to support plastic laminate counters, securely fastened to wall and to underside of counters.

3.9 CLEAN UP AND PROTECTION

- A. Clean Up: At regular intervals during the course of the work, all debris and excess material shall be cleaned up and removed from the site. Upon completion of installation, clean all spaces of debris caused by woodwork installation.
- B. Protection: Protect all woodwork from marring, defacement of other damage until final completion and acceptance of the project by the Owner. Repair or replace all defective units prior to final inspection as directed by the Architect. Any units that cannot be satisfactorily repaired in the opinion of the Architect shall be replaced with new units of same original design, at no additional cost to the Owner.

END OF SECTION

SECTION 07210

BUILDING INSULATION

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment and services necessary to complete the building insulation as shown on the drawings and/or specified herein, including but is not limited to, the following:
 - 1. Acoustical insulation.
 - 2. Attachment devices.

1.3 RELATED SECTIONS

- A. Roof insulation – Division 7.

1.4 SUBMITTALS

- A. Submit product data for each type of product indicated.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for insulation products.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type and brand. Delivered materials shall be identical to approved samples.
- B. Store materials under cover in a dry and clean location, off the ground. Remove materials which are damaged or otherwise not suitable for installation and replace with acceptable materials.
- C. Take every precaution to prevent the insulation from becoming wet, cover with tarps or other weather/watertight sheet goods.

PART 2 PRODUCTS

2.1 ACOUSTICAL INSULATING MATERIALS

A. Acoustic Insulation Type 1 - Safing Insulation

1. Safing insulation should be 4 to 5 pound density unfaced semi-rigid fiberglass or mineral wool material. Thickness as called out on the drawings or as required to fully pack voids. Safing insulation should be dimensionally stable and should not slump within cavity. Safing insulation should be inorganic, rot , mildew and vermin proof and should not corrode steel, copper and aluminum. Flame spread and smoke developed index not to exceed 25 and 50 respectively per ASTM E-84.
2. The following are acceptable:
 - a. Safing Insulation/Mineral Wool from Owens Corning Fiberglass Corporation, Toledo, OH 419-248-8000
 - b. Pyro Fiber Safing from Johns Manville Mechanical Insulation Division, Denver, CO 800-654-3103
 - c. Or approved equal.

B. Acoustic Insulation Type 2 - Sound Absorptive Material For Penetrations

1. Sound absorptive material for around penetrations in walls and floor/ceiling assemblies shall be fiberglass or mineral fiber with a density of 1-1/2 lb/ft³. Thickness shall be as called out on the drawings. It shall be unfaced and supplied in semi-rigid batts or rolls. Flame spread and smoke developed index not to exceed 25, per ASTM E-84. Material shall be non-combustible per ASTM E136. Where large penetrations occur in fire-rated constructions, the use of a semi-rigid fire-rated mineral-wool safing may be required.
2. For use in sealing penetrations of acoustically-rated partitions, pack material completely in space between object of penetration and partition, leaving no voids or spaces.
3. The following are acceptable:
 - a. Industrial Insulation Type 701 unfaced, from Owens-Corning Fiberglas Corporation, Toledo, OH 419-248-8000
 - b. Insul-Shield 150 from Johns Manville Mechanical Insulation Division, Denver, CO 800-654-3103
 - c. Insulation Board from Knauf Fiber Glass GmbH, Shelbyville, Indiana 317-398-4434

2.2 ACCESSORIES

- A. Clips for Securing Insulation to Encountered Surfaces: Spindle anchor and washer type consisting of perforated metal plates with spindle welded to center and snap on washers. Spindle and washers shall receive a corrosion resistant electro-zinc plating. Adhesives for securing clips in place shall be recommended by the approved clip manufacturer.
 - 1. Acceptable Manufacturers
 - a. Miracle Adhesives Corp.
 - b. Stic-Klip Mfg. Co., Inc.
 - c. Eckel Industries, Inc.
- B. Adhesive for Bonding Insulation: The type recommended by the insulation manufacturer, and complying with fire-resistance requirements.
 - 1. For bonding rigid polystyrene insulation to masonry or concrete, provide adhesive equal to "Foamgrab PS" made by Dacor Products Co. or equal made by ChemRex Inc. or Miracle Adhesives.
- C. Protection Board: Premolded, semi-rigid asphalt/fiber composition board, 1/4" thick, formed under heat and pressure, standard sizes.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where building insulation is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- B. General
 - 1. Cooperate in the coordination and scheduling of the work of this section with the work of other sections so as not to delay job progress.
 - 2. Install insulation in as large components as practical and to cover entire areas indicated on the drawings, closely butted together at sides and ends, and against walls, beams, etc. Neatly fit and cut insulation around all projections such as pipes, conduits, hangers and all other elements encountered in the field, which will result in complete coverage of the scheduled areas.

3. Discard, off the site insulation which becomes damaged during the course of installation, or is no longer in a physical condition to function for use intended, and replace with new material.
4. Clean surfaces on which adhesives are used to secure the insulation in place of dirt, grime, grease, oil and other foreign materials, to assure that the surfaces are properly prepared to accept the bond of the approved adhesives.
5. Exercise extreme care to avoid damage and soiling of faces on insulation units which will be exposed to view. Align joints accurately, with adjoining surfaces set flush.
6. Set vapor barrier faced units with vapor barrier to inside of construction, except as otherwise shown. Do not obstruct ventilation spaces. All joints in vapor barriers shall be sealed with 4" wide, foil faced duct tape to prevent vapor and air migration.
7. Tape joints and ruptures in vapor barriers, using tape specified above, and seal each continuous area of insulation to surrounding construction so as to ensure vapor tight installation of the units.
8. Where insulation is impaled on stick clips, provide clips not less than 3" from corners or edges and not more than 12" o.c.
9. Comply with manufacturer's instructions for the particular conditions of installation in each case. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work.
10. Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.
11. Apply a single layer of insulation to the required thickness, unless a double layer is required, to make up the total thickness shown.

3.3 INSTALLATION OF BLANKET OR BATT FIBERGLASS INSULATION

- A. Install blanket fiberglass insulation in largest pieces as practical with edges closely butted. Cut and fit insulation to closely fit intersecting or penetrating surfaces.
 1. Face vapor barrier towards warm side, tape joints with 4" wide vaporproof aluminum tape applied over vapor barrier.

3.4 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation will be subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION

SECTION 07920

JOINT SEALERS

PART 1 GENERAL

1.1 SUBMITTALS

- A. In accordance with the requirements of Section 01605, submit a complete listing of all manufacturers, products, model numbers, and designs proposed for use in the Work of this Section.
- B. Maintain two copies of all shop drawings, product data, and samples, manufacturer's specifications, recommendations, installation instructions, and maintenance data at the Project Site. At Project Closeout, turn over both copies to the Architect who will transmit one copy to the Owner.
- C. Submit only the items listed below to the Architect for review in accordance with Conditions of the Contract and Division One sections.
- D. 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.
- E. Samples for Verification: For each type and color of joint sealant required. Install joint sealants in ~~1/2-inch-~~ (13-mm-) wide joints formed between two ~~6-inch-~~ (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- F. Product Certificates: Signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for the use indicated.
- G. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- H. Preconstruction Field Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on preconstruction testing specified in "Quality Assurance" Article.
- I. Field Test Report Log: For each elastomeric sealant application. Include information specified in "Field Quality Control" Article.

- J. Compatibility and Adhesion Test Reports: From sealant manufacturer indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- K. Product Test Reports: From a qualified testing agency indicating sealants comply with requirements, based on comprehensive testing of current product formulations.
- L. Warranties: Special warranties specified in this Section.

1.2 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.
- B. Preconstruction Compatibility and Adhesion Testing: Submit to joint sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Use manufacturers standard test methods to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - a. Perform tests under environmental conditions replicating those that will exist during installation.
 - 2. Submit not fewer than nine pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
 - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 4. For materials failing tests, obtain joint sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
 - 5. Preconstruction testing will not be required if joint sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

- C. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates as follows:
1. Locate test joints where indicated or, if not indicated, as directed by Architect.
 2. Conduct field tests for each type of elastomeric sealant and joint substrate indicated.
 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 4. Arrange for tests to take place with joint sealant manufacturer's technical representative present.
 5. Test Method: Test joint sealants by hand-pull method described below:
 - a. Install joint sealants in **60-inch- (1500-mm-)** long joints using same materials and methods for joint preparation and joint-sealant installation required for the completed Work. Allow sealants to cure fully before testing.
 - b. Make knife cuts from one side of joint to the other, followed by two cuts approximately **2 inches (50 mm)** long at sides of joint and meeting cross cut at one end. Place a mark **1 inch (25 mm)** from cross-cut end of **2-inch (50-mm)** piece.
 - c. Use fingers to grasp **2-inch (50-mm)** piece of sealant between cross-cut end and **1-inch (25-mm)** mark; pull firmly at a 90-degree angle or more in direction of side cuts while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.
 - d. For joints with dissimilar substrates, check adhesion to each substrate separately. Do this by extending cut along one side, checking adhesion to opposite side, and then repeating this procedure for opposite side.
 6. Report whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
 7. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.3 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Installer's Warranty: Written warranty, signed by Installer agreeing to repair or replace elastomeric 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.
- C. Special Manufacturer's Warranty: Written warranty, signed by elastomeric sealant manufacturer agreeing to furnish elastomeric 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.
- D. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
 - 1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
 - 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

1.4 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealant Standard: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant, including those referencing ASTM C 920 classifications for type, grade, class, and uses.

- B. Additional Movement Capability: Where additional movement capability is specified in the Elastomeric Joint-Sealant Schedule, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C 920 for uses indicated.
- C. Stain-Test-Response Characteristics: Where elastomeric 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.
 - 1. Porous joint surfaces include, but are not limited to, the following:
 - a. Concrete.
 - b. Masonry.
 - c. Marble.
 - d. Granite.
 - e. Limestone.
 - f. Unglazed surfaces of ceramic tile.
- D. Continuous-Immersion-Test-Response Characteristics: Where elastomeric sealants will be immersed continuously in water, provide products that have undergone testing according to ASTM C 1247, including initial six-week immersion period and one additional four-week immersion periods, and have not failed in adhesion or cohesion when tested with substrates indicated for Project.
- E. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600 **ANSI 51 Protocol**.

1.5 SILICONE ELASTOMERIC JOINT-SEALANTS

- A. Low-Modulus, Nonacid,-Curing Silicone Sealant:
 - 1. Type and Grade: S (single component) and NS (nonsag).
 - 2. Class: 50
 - 3. Additional Movement Capability: 50 percent movement in extension and 50 percent movement in compression.
 - 4. Use Related to Exposure: NT (nontraffic).
 - 5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

6. Stain-Test-Response Characteristics: Nonstaining to porous substrates per ASTM C 1248.
7. Applications: All exterior locations not otherwise indicated, and sealant joints on interior side of components subject to thermal movement from external heat sources, included but not limited to EIFS to EIFS, or EIFS to other surfaces.
8. Products:
 - a. Spectrem 3; Tremco Inc..
 - b. No Substitutions

B. Medium-Modulus Neutral, Nonacid,-Curing Silicone Sealant:

1. Type and Grade: S (single component) and NS (nonsag).
2. Class: 25.
3. Additional Movement Capability: 50 percent movement in extension and 50 percent movement in compression
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
6. Stain-Test-Response Characteristics: Nonstaining to porous substrates per ASTM C 1248.
7. Applications: All structural glazing and internal seals for glazing system.
8. Products:
 - a. Spectrem 2; Tremco Inc.
 - b. No Substitutions

1.6 POLYURETHANE ELASTOMERIC SEALANTS

1.7 PAVEMENT JOINT SEALANT

A. Multicomponent Pourable Urethane Sealant:

1. Products:
 - a. Tremco; THC-901; for horizontal slopes up to 10%;
 - b. Tremco; THC-900; for horizontal slopes up to 5%.
2. Type and Grade: M (multicomponent) and P (pourable).
3. Class: **25**.
4. Use Related to Exposure: T (traffic).
5. Uses Related to Joint Substrates: M, A, and, as applicable to joint substrates indicated, O.

1.8 SOLVENT-RELEASE JOINT-SEALANT

- A. Butyl-Rubber-Based Solvent-Release Joint-Sealant Standard: Comply with ASTM C 1085
 - 1. Products:
 - a. **Butyl: Tremco Inc.**
 - 2. Applications: Concealed interior locations.
- B. Pigmented Narrow Joint Sealant: Solvent-release-curing, pigmented, synthetic-rubber sealant complying with AAMA 803.3 and formulated for sealing joints **3/16 inch (5 mm)** or smaller in width.
 - 1. Products: PTI 200; H.B. Fuller Company.

1.9 LATEX JOINT-SEALANT

- A. Latex Sealant Standard: Comply with ASTM C 834.
 - 1. Products:
 - a. **Tremflex 834; Tremco Inc.**
 - b. AC-20; Pecora Corporation.
 - c. PSI-701; Polymeric Systems, Inc.
 - d. Sonolac; Sonneborn Building Products Div., ChemRex, Inc.
 - e. Chem-Calk 600; Bostik Inc
 - 2. Applications: All exposed interior locations except where elastomeric sealants are indicated or required.

1.10 ACOUSTICAL JOINT-SEALANT

- A. Acoustical Sealant for Exposed and Concealed Joints: Nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following:
 - 1. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
 - 2. Products:
 - a. SHEETROCK Acoustical Sealant; USG Corp., United States Gypsum Co.
 - b. AC-20 FTR Acoustical and Insulation Sealant; Pecora Corporation.

- B. Acoustical Sealant for Concealed Joints: Nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

1. **Acoustical Sealant; Tremco Inc.**
2. **Product BA 98; Pecora Corporation**

1.11 MILDEW-RESISTANT SILICONE SEALANT:

- A. Provide products formulated with fungicide that are intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and temperature extremes, and that comply with the following:

1. Type and Grade: S (single component) and NS (nonsag).
2. Class: 25.
3. Use Related to Exposure: NT (nontraffic).
4. Uses Related to Joint Substrates: G, A, and, as applicable to joint substrates indicated, O.
5. Applications: Sealant joints at perimeter of plumbing fixtures, countertops, and all other interior locations subject to exposure to moisture.
6. Products:
 - a. **Tremsil 200; Tremco Inc.**
 - b. Sanitary 1700; GE Silicones.
 - c. NuFlex 302; NUCO Industries, Inc.
 - d. 898 Silicone Sanitary Sealant; Pecora Corporation.
 - e. PSI-611; Polymeric Systems, Inc.
 - f. 786 Mildew Resistant; Dow Corning.

1.12 JOINT-SEALANT BACKING

- A. Provide sealant backings of material and type 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. **Closed Cell** Cylindrical Sealant Backings: ASTM C 1330, of type recommended by sealant manufacturer and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

- C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to **minus 26 deg F (minus 32 deg C)**. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.
- D. 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 where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

1.13 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 with joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS:

- A. Comply with manufacturer's printed instructions except where more stringent requirements are shown or specified, and except where manufacturer's technical representative directs otherwise.

3.2 JOINT PREPARATION:

- A. Clean out joints immediately before installation of sealant or caulking compound. Remove dirt, insecure coatings, moisture and other substances which could interfere with bond or sealant or caulking compound. Etch concrete and masonry joint surfaces as recommended by sealant manufacturer. Roughen vitreous and glazed joint surfaces as recommended by sealant manufacturer.
 - 1. Prime or seal joint surfaces where indicated, and where recommended by sealant manufacturer. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.

3.3 INSTALLATION:

- A. Set joint filler units as depth or position in joint to coordinate with other work, including installation of bond breakers, backer rods and sealants. Do not leave voids or gaps between ends of joint filler units.
- B. Install sealant backer rod for liquid-applied sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for application indicated.
- C. Employ only proven installation techniques, which will ensure that sealants are deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.
- D. Install sealant to depths as shown or, if not shown, as recommended by sealant manufacturer but within the following general limitations, measured at center (thin) section of bead.
 - 1. For joint sealed with non-elastomeric sealants and calking compounds, fill joints to a depth of 50% of joint width.
- E. Spillage: Do not allow sealants or compounds to overflow or spill onto adjoining surfaces, or to migrate into voids of adjoining surfaces. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.
- F. Recess exposed edges of gaskets and exposed joint fillers slightly behind adjoining surfaces, unless otherwise shown, so that compressed units will not protrude from joints.

3.4 CURE AND PROTECTION:

- A. Cure sealants and calking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability. Advise Contractor of procedures required for cure and protection of joint sealers during construction period, so that they will be without deterioration or damage (other than normal wear and weathering) at time of substantial completion.

END OF SECTION

SECTION 08100

STEEL DOORS AND FRAMES

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the steel doors and frames work as shown on the drawings and/or specified herein, including but not limited to, the following:
 1. Interior and exterior hollow metal doors and frames for fire rated and unrated door openings.
 2. Trimmed openings.
 3. Interior hollow metal vision panels.
 4. Preparation of metal doors and frames to receive finish hardware, including reinforcements, drilling and tapping necessary.
 5. Preparation of hollow metal doors to receive glazing where required.
 6. Furnishing anchors for building into masonry and drywall.
 7. Factory prime painting of work of this Section.

1.3 RELATED SECTIONS

- A. Rough Carpentry - Section 06100.
- B. Finish hardware - Section 08710.
- C. Gypsum Drywall – Section 09250
- D. Painting - Section 09900.

1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, core descriptions, label compliance, sound and fire-resistance ratings, and finishes for each type of door and frame specified.

- B. Shop Drawings: Show fabrication and installation of doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, dimensions of profiles and hardware preparation, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessories.
- C. Door Schedule: Submit schedule of doors and frames using same reference numbers for details and openings as those on Drawings.
 - 1. Coordinate glazing frames and stops with glass and glazing requirements.
- D. Oversize Construction Certification: For door assemblies required to be fire rated and exceeding limitations of labeled assemblies, submit certification of a testing agency acceptable to authorities having jurisdiction that each door and frame assembly has been constructed to comply with design, materials, and construction equivalent to requirements for labeled construction.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing custom steel doors and frames 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.
- B. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors and frames palleted, wrapped, or crated to provide protection during transit and Project site storage. Do not use nonvented plastic.
- B. Inspect doors and frames, on delivery, for damage. Minor damage may be repaired provided refinished items match new work and are approved by Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames under cover at building site. Place units on minimum 4-inch high wood blocking. Avoid using nonvented plastic or canvas shelters that could create a humidity chamber. If wrappers on doors become wet, remove cartons immediately. Provide minimum 1/4-inch spaces between stacked doors to permit air circulation.

PART 2 PRODUCTS

2.1 FABRICATION - GENERAL

- A. Fabricate hollow metal units to be rigid, neat in appearance and free from defects, warp or buckle. Accurately form metal to required sizes and profiles. Weld exposed joints continuously, grind, dress, and make smooth, flush and invisible. Metallic filler to conceal manufacturing defects is not acceptable.
- B. Unless otherwise indicated, provide countersunk flat Phillips or Jackson heads for exposed screws and bolts.
- C. At exterior locations provide doors and frames which have been fabricated as thermal insulating assemblies.
 - 1. Unless otherwise indicated, provide thermal rated assemblies with U factors of 0.24 Btu (hr./ft. 2/deg F.)
- D. Prepare hollow metal units to receive finish hardware, including cutouts, reinforcing, drilling and tapping in accordance with Finish Hardware Schedule and templates provided by hardware suppliers. Comply with applicable requirements of ANSI A115 "Specifications for Door and Frame Preparation for Hardware".
- E. Locate finish hardware as shown on final shop drawings in accordance with locations noted herein.

2.2 MANUFACTURERS

- A. Provide products manufactured by Amweld Building Products, Inc., Ceco Door Products, Pioneer Industries, or approved equal meeting these specifications. **Or approved equal by Architect.**

2.3 FRAMES

- A. Materials
 - 1. Frames for interior openings shall be either commercial grade cold-rolled steel conforming to ASTM A366-68 or commercial grade hot-rolled and pickled steel conforming to ASTM A569-66T. Metal thickness shall be not less than sixteen (16) ga. for frames in openings 4'-0" or less in width; not less than fourteen (14) ga. for frames in openings over 4'-0" in width. All exterior frame openings shall be 14 gauge Galvanized steel.
- B. Design and Construction

1. All frames shall be custom made welded units with integral trim, of the sizes and shapes shown on approved shop drawings. Knocked-down frames will not be accepted.
2. All finished work shall be strong and rigid, neat in appearance, square, true and free of defects, warp or buckle. Moulded members shall be clean cut, straight and of uniform profile throughout their lengths.
3. Jamb depths, trim, profile and backbends shall be as shown on drawings.
4. Frames shall have corners mitered, reinforced and continuously welded full depth and width of frame; conforming to NAAMM Standard HMMA-820.
5. Minimum depth of stops shall be 5/8".
6. Frames for multiple or special openings shall have mullion and/or rail members which are closed tubular shapes having no visible seams or joints. All joints between faces of abutting members shall be securely welded and finished smooth.
7. Hardware Reinforcements
 - a. Frames shall be mortised, reinforced, drilled and tapped at the factory for fully templated mortised hardware only, in accord with approved hardware schedule and templates provided by the hardware supplier. Where surface-mounted hardware is to be applied, frames shall have reinforcing plates.
 - b. Minimum thickness of hardware reinforcing plates shall be as follows:
 - 1). Hinge and pivot reinforcements - seven (7) ga., 1-1/4" x 10" minimum size.
 - 2). Strike reinforcements - twelve (12) gauge
 - 3). Flush bolt reinforcements - twelve (12) gauge
 - 4). Closer reinforcements - twelve (12) gauge
 - 5). Reinforcements for surface mounted hardware - twelve (12) gauge.
8. Floor Anchors
 - a. Floor anchors shall be securely welded inside each jamb for floor anchorage.
 - b. Where required, provide adjustable floor anchors, providing not less than two (2) inch height adjustment.
 - c. Minimum thickness of floor anchors shall be fourteen (14) gauge.
9. Jamb Anchors

- a. Frames for installation in masonry walls shall be provided with adjustable jamb anchors of the stirrup and strap type. Anchors shall be not less than sixteen (16) gauge steel or 0.156" diameter steel wire. Stirrup straps shall be not less than 2" x 10" in size, corrugated and/or perforated. The number of anchors provided on each jamb shall be as follows:
 - 1). Frames up to 7'-6" height - three (3) anchors.
 - 2). Frames 7'-6" to 8'-0" height - four (4) anchors.
 - 3). Frames over 8'-0" height - one (1) anchor for each 2' or fraction thereof in height.
 - b. Frames for installation in stud partitions shall be provided with steel anchors of suitable design, not less than eighteen (18) gauge thickness, securely welded inside each jamb as follows:
 - 1). Frames up to 7'-6" height - four (4) anchors.
 - 2). Frames 7'-6" to 8'-0" height - five (5) anchors.
 - 3). Frames over 8'-0" height - five (5) anchors plus one additional for each 2' or fraction thereof over 8'-0".
 - c. Frames to be anchored to previously placed concrete or masonry shall be provided with minimum 3/8" concealed bolts set into expansion shields or inserts at six (6) inches from top and bottom and twenty four (24) inches o.c. Reinforce frames at anchor locations with sixteen (16) gauge sheet steel stiffeners welded to frame at each anchor.
10. Frames for installation in masonry wall openings more than 4'-0" in width shall have an angle or channel stiffener factory welded into the head. Such stiffeners shall be not less than twelve (12) gauge steel and not longer than the opening width, and shall not be used as lintels or load bearing members.
 11. Dust cover boxes (or mortar guards) of not thinner than twenty six (26) gauge steel shall be provided at all hardware mortises on frames to be set in masonry or plaster partitions.
 12. All frames shall be provided with a steel spreader temporarily attached to the feet of both jambs to serve as a brace during shipping and handling.
 13. Loose glazing stops shall be of cold rolled steel, not less than twenty (20) gauge thickness, butted at corner joints and secured to the frame with countersunk cadmium-or zinc-plated screws. Interior frames may be provided with snap-on glazing stops.
 14. Drill stops to receive three (3) silencers on strike jambs of single door frames and two (2) silencers on heads of double-door frames.
- C. Finish: After fabrication, all tool marks and surface imperfections shall be removed, and exposed faces of all welded joints shall be dressed smooth. Frames shall then be chemically treated to insure maximum paint adhesion and

shall be coated on all accessible surfaces with one coat of rust-inhibitive baked-on alkyd primer standard with the manufacturer which is fully cured before shipment to a dry film thickness of 2.0 mils.

2.4 HOLLOW METAL DOORS

- A. Materials: Doors shall be made of commercial quality, level, cold rolled steel conforming to ASTM A366-68 and free of scale, pitting or other surface defects. Face sheets for interior doors shall be not less than sixteen (16) gauge. All exterior doors shall be not less than 16 gauge galvanized steel.
- B. Design and Construction
1. All doors shall be custom made, of the types and sizes shown on the approved shop drawings, and shall be fully welded seamless construction with no visible seams or joints on their faces or vertical edges. Minimum door thickness shall be 1-3/4".
 2. All doors shall be strong, rigid and neat in appearance, free from warpage or buckles. Corner bends shall be true and straight and of minimum radius for the gauge of metal used.
 3. Face sheets shall be stiffened by continuous vertical formed steel sections spanning the full thickness of the interior space between door faces. These stiffeners shall be not less than twenty two (22) gauge spaced not more than six (6) inches apart and securely attached to face sheets by spot welds not more than five (5) inches o.c. Spaces between stiffeners shall be sound-deadened and thermal insulated the full height of the door with an inorganic non-combustible batt-type material.
 - a. Honeycomb or polystyrene door fillers are not acceptable.
 4. Door faces shall be joined at their vertical edges by a continuous weld extending the full height of the door. All such welds shall be ground, filled and dressed smooth to make them invisible and provide a smooth flush surface.
 5. Top and bottom edges of all doors shall be closed with a continuous recessed steel channel not less than sixteen (16) gauge, extending the full width of the door and spot welded to both faces.
 6. Edge profiles shall be provided on both vertical edges of doors as follows:
 - a. Single-acting swing doors - beveled 1/8" in two (2) inches.
 - b. Double acting swing doors - rounded on 2-1/8" radius.

7. Hardware Reinforcements

- a. Doors shall be mortised, reinforced, drilled and tapped at the factory for fully templated hardware only in accord with the approved hardware schedule and templates provided by the hardware supplier. Where surface-mounted hardware (or hardware, the interrelation of which is to be adjusted upon installation - such as top and bottom pivots, floor closers, etc.) is to be applied, doors shall have reinforcing plates.
- b. Minimum gauges for hardware reinforcing plates shall be as follows:
 - 1). Hinge and pivot reinforcement - seven (7) gauge.
 - 2). Reinforcement for lock face, flush bolts, concealed holders, concealed or surface mounted closers - twelve (12) gauge.
 - 3). Reinforcements for all other surface mounted hardware - sixteen (16) gauge.

8. Glass Mouldings and Stops

- a. Where specified or scheduled, doors shall be provided with hollow metal mouldings to secure glazing by others in accordance with glass opening sizes shown on drawings.
- b. Fixed mouldings shall be securely welded to the door on the security side.
- c. Loose stops shall be not less than twenty (20) gauge steel, with mitered corner joints, secured to the framed opening by cadmium or zinc-coated countersunk screws space eight (8) inches o.c. Snap-on attachments will not be permitted. Stops shall be flush with face of door.

9. Doors requiring acoustic gasket hardware, the door leaf shall be solid core steel, 1-3/4" thick flush construction with a minimum face density of 5 lb/ft sq. Steel door leaf shall be constructed from welded 18 gauge cold rolled steel seamless sheet with a solid core of fiber board or other material providing he 5 lb/ft sq. density.

- C. Finish: After fabrication, all tool marks and surface imperfections shall be dressed, filled and sanded as required to make all faces and vertical edges smooth, level and free of all irregularities. Doors shall then be chemically treated to insure maximum paint adhesion and shall be coated, on all exposed surfaces, with manufacturer's standard rust-inhibitive alkyd primer as specified for frames which fully cured before shipment.
- D. Flatness: Doors shall maintain a flatness tolerance of 1/16" maximum, in any direction, including in a diagonal direction.

2.5 LABELED DOORS AND FRAMES

- A. Labeled doors and frames shall be provided for those openings requiring fire protection ratings as scheduled on drawings. Such doors and frames shall be labeled by Underwriters' Laboratories or other nationally recognized agency having a factory inspection service.
- B. If any door or frame specified by the Architect to be fire-rated cannot qualify for appropriate labeling because of its design, size, hardware or any other reason, the Architect shall be so advised before fabricating work on that item is started.

2.6 HARDWARE LOCATIONS

- A. The location of hardware on doors and frames shall be as follows unless otherwise required by prevailing Handicap Codes:
 - 1. Hinges: Top five (5) inches from head of frame to top of hinge; bottom 10" \pm 1" from finish floor to bottom of hinge; intermediate centered between top and bottom hinges.
 - 2. Unit and integral type locks and latches - thirty eight (38) inches to centerline of knob.
 - 3. Deadlocks: Sixty (60) inches to centerline of cylinder.
 - 4. Panic Hardware: Thirty eight (38) inches to centerline of cross bar.
 - 5. Door Pulls: Forty two (42) inches to center of grip.
 - 6. Push-Pull Bars: Forty two (42) inches to centerline of bar.
 - 7. Push Plates: Forty eight (48) inches to centerline of plate.

All of the above dimensions are from finished floor.

CLEARANCES

- B. Fabricate doors and frames to meet edge clearances as follows:
 - 1. Jambs and Head: 3/32 inch.
 - 2. Meeting Edges, Pairs of Doors: 1/8 inch.
 - 3. Bottom: 3/8 inch, if no threshold or carpet.
 - 4. Bottom: 1/8 inch, at threshold or carpet.
- C. Fire rated doors shall have clearances as required by NFPA 80.

2.7 MANUFACTURING TOLERANCES

A. Manufacturing tolerance shall be maintained within the following limits:

1. Frames for Single Door or Pair of Doors

a. Width, Measured Between Rabbets at the Head

1). Nominal opening width $+1/16"$, $-1/32"$

b. Height (total length of jamb rabbet):

1). Nominal opening height $+3/64"$

c. Cross Sectional Profile Dimensions

1). Face: $+1/32"$

2). Stop: $+1/32"$

3). Rabbet: $+1/64"$

4). Depth: $+1/32"$

5). Throat: $+1/16"$. Frames overlapping walls to have throat dimension $1/8"$ greater than dimensioned wall thickness to accommodate irregularities in wall construction.

2. Doors

a. Width: $+3/64"$

b. Height: $+3/64"$

c. Thickness: $+1/16"$

d. Hardware Cutout Dimensions

1). Template dimensions $+0.015"$, $-0"$

e. Hardware Location: $+1/32"$

2.8 PREPARATION FOR FINISH HARDWARE

A. Prepare door and frames to receive hardware:

1. Hardware supplier shall furnish hollow metal manufacturer approved hardware schedule, hardware templates, and samples of physical hardware where necessary to insure correct fitting and installation.

2. Preparation includes sinkages and cut-outs for mortise and concealed hardware.

B. Provide reinforcements for both concealed and surface applied hardware:

1. Drill and tap mortise reinforcements at factory, using templates.

2. Install reinforcements with concealed connections designed to develop full strength of reinforcements.

2.9 REJECTION

- A. Hollow metal frames or doors which are defective, have hardware cutouts of improper size or location, or which prevent proper installation of doors, hardware or work of other trades, shall be removed and replaced with new at no cost.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where steel doors and frames are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Refer to Section 06100 for installation procedures for all work of this Section.

END OF SECTION

SECTION 08200

FLUSH WOOD DOORS

PART 1 GENERAL

1.1 Summary

- A. The General Provisions of the Contract including General and Supplemental Provisions, Special Provisions and Division 1 - General Requirements, apply to work specified in this section.
- B. Related Sections:
 - 1. Section 06400 – Architectural Woodwork.
 - 2. Section 08100 - Standard Steel Frames: Steel Door Frames.
 - 3. Section 08700 - Finish Hardware: Door Hardware.
 - 4. Section 08800 - Glazing: Glass & Glazing.

1.2 Quality Assurance

- A. Obtain doors from a single manufacturer, if possible to ensure uniformity in quality of appearance and construction. All material supplied for this project shall conform to the SWI Sections 200, 1300, and 1400 for Premium Grade wood doors.
- B. All labeled fire door assemblies shall be of a type which has been classified and listed in accordance with the latest edition of ANSI/ NFPA 80 and tested in compliance with ASTM E152, NFPA 252, and UL10B. A physical label shall be permanently affixed to the fire door at an authorized facility. Furthermore, all B & C Label Doors are to have Manufacturer's Standard Laminated Stiles for improved screw holding and split resistance capabilities.

1.3 Submittals

- A. Product Data: Submit manufacturer's descriptive literature, specifications, installation instructions, warranty form and other data required to indicate compliance with specified requirements.
- B. Shop Drawings:
 - 1. Submit door schedule indicating opening identifying number, door type, grade, size, thickness, swing, label requirements and undercuts.
 - 2. Include door elevations indicating type of construction and conditions at cutouts for vision panels and louvers.
 - 3. Detail full size molding sections.

4. Indicate prefitting and premachining requirements including hardware locations.
5. Use same reference numbers for openings and details.

C. Samples:

1. Submit corner samples of each type of door with selected plastic laminate finish. (As required by Architect.)

1.4 Delivery, Storage and Handling

- A. Protect during transit, storage and handling to prevent damage, soiling and deterioration.
- B. Comply with manufacturer's instructions with "On-Site-Care" requirements of AWI Section 1300-G-22, "Care and Installation at Job Site."
- C. Delivery: Deliver to site after wet construction operations are completed and dry and building has reached average prevailing relative humidity of locality.
- D. Deliver components in manufacturer's original unopened protective covering or container, clearly marked with manufacturer's name, brand name and identifying number on covering.

1.5 Warranty

- A. Submit written warranty on manufacturer's standard form signed by official of door manufacturer agreeing to repair or replace defective doors which have:
 1. Delamination in any degree.
 2. Warp or twist of 1/4" or more in any 3'0" x 7'0" plane of door face.
 3. Telegraphing of stile, rail or core through face to cause surface variation in excess of 1/100" in any 3" span.
- B. When hanging doors, do not subject them to extremes of heat and/or humid conditions. Relative humidity shall not be less than 30% nor more than 60%.
- C. Warranty shall also include refinishing and reinstallation which may be require due to repair or replacement of the defective doors.
- D. Warranty shall be in effect for life of original installation.

PART 2 PRODUCTS

2.1 Acceptable Manufacturers

- A. A specific product or material manufactured by any of the following listed manufacturers are "Acceptable," (not "approved"), only if the specific product or material can evidence exact compliance with the Contract Documents.

Algoma Hardwoods, Inc.

Eggers Industries, Architectural Door Division

Graham Manufacturing Corporation, Architectural Doors

Weyerhaeuser Company

Simpson "MasterMark"

2.2 Materials

- A. Flush Wood Doors

Faces: HGS(nominal 0.048") high pressure decorative laminate.

Core: Bonded Structural Composite (SCLC-HPDL-5).

Vertical Edges: Matching HGS laminate; no visible joints allowed.

Lights, louvers: Metal vision frame or louver to match.

Adhesive: Exterior use minimum Type I ANSI/NWWDA 1.S-1 Series Interior use minimum Type I ANSI/NWWDA 1.S-1 Series.

2.3 Pre-fitting and Preparation for hardware.

- A. Pre-fit and pre-machine all wood doors at factory.
- B. Pre-machine doors in accordance with final approved hardware and frame schedule.
- C. Fire doors shall be machined in strict compliance to provision of NFPA-80 latest edition.

- D. Pre-machine doors within industry tolerances. "A $\pm 1/32$ " will be allowed on all hardware locations. A $+1/32$ ", $-1/64$ " tolerance will be allowed on lock front preparation cutouts."

2.4 Fabrication

A. General

1. Comply with AWI Quality Standards Section 1300 for premium grade wood doors with plastic laminate faces, except to meet or exceed requirements herein specified.
2. Completely factory prefit to required size ready for installation at project site; no on-jobsite trimming permitted.
3. Prepare in accordance with frame shop drawings and schedule, hardware schedule and templates.

- B. Thickness: 1-3/4" thick for flush doors unless indicated otherwise on door schedule.

PART 3 EXECUTION

3.1 Preparation

- A. Examine door frames and verify frames are of correct type and have been installed for proper hanging of corresponding doors.

3.2 Installation

- A. Install in accordance with manufacturer's written instructions.
- B. Install fire rated doors in accordance with NFPA-80.
- C. Install accurately in frame, within clearances specified. Install hardware in accordance with manufacturer's written instructions and associated templates. Refer to Section 08710 for general installation requirements.
- D. Do not field cut doors down to opening sizes smaller than those for which doors were manufactured. Do not install door in frame set out of plumb or square.
- E. Install to operate freely, but not loosely, free from hinge bound conditions, striking or binding. Do not install in frames which would hinder operations of doors. Hang free from rattling when in latched position.
- F. Pilot holes must be drilled for screws attaching hinges, lock hardware and all other devices to the stile or face of wood doors. Pilot holes shall not exceed 90% of the root diameter of the screw.

3.3 Adjusting

- A. Adjust and check each door to ensure proper operating and function.
- B. Replace or re-hang doors which are hinge bound and do not swing or operate freely.
Replace or re-hang doors which are warped, twisted, or which are not in true planes.
- C. Replace doors damaged during installation.

END OF SECTION

SECTION 08710

FINISH HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to the work of this section.

1.2 DESCRIPTION OF WORK:

- A. Extent of finish hardware is shown on the drawings and in schedules.
- B. Definition: "Finish Hardware" includes items known commercially as builders hardware which are required for swing, sliding and folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frame. Types of items in this section include (but are not necessarily limited to):

- Hinges
- Lock cylinders and keys
- Lock and latch sets
- Closers
- Miscellaneous door control devices
- Pneumatic closers
- Protection plates

1.3 QUALITY ASSURANCE:

- A. Manufacturer: Obtain each kind of hardware (latch and lock sets, hinges, closers, etc.) from only one manufacturer, although several may be indicated as offering products complying with requirements.
- B. Supplier: A recognized builders hardware supplier who has been furnishing hardware in the project's vicinity for a period of not less than 2 years, and who is, or employs an experienced hardware consultant who is available, at reasonable times during the course of the work, for consultation above project's hardware requirements, to Owner, Architect and Contractor.

- C. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80. Provide only hardware which has been tested and listed by UL for types and sizes of doors required and complies with requirements of door and door frame labels.
- D. Handicapped Hardware: Provide hardware with tactile warning to comply with ANSI standards where required.

1.4 SUBMITTALS:

- A. Product Data: Submit manufacturer's technical information for each item of hardware. Include whatever information may be necessary to show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finish. Include copies of UL test data on items for fire-rated openings.
- B. Hardware Schedule: Submit final hardware schedule in the manner indicated below. Hardware schedules are intended for coordination of work.
 - 1. Final Hardware Schedule Content: Based on hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following:
 - a. Type, style, function, size and finish of each hardware item.
 - b. Name and manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of hardware set cross-referenced to indications on Drawings both on floor plans and door and frame schedule.
 - e. Explanation of all abbreviations, symbols, codes, etc., contained in schedule.
 - f. Mounting locations for hardware.
 - g. Door and frame sizes and materials.
 - 2. Submittal Sequence: Submit schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work (e.g., hollow metal frames) which is critical in the project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by builder's hardware, and other information essential to the coordinated review of hardware schedule.

1.5 PRODUCT HANDLING:

- A. Packaging of hardware, on a set by set basis, is the responsibility of the supplier. As material is received by the hardware supplier from the various manufacturers, sort and repackage in containers marked with the hardware set number. Two or more identical sets may be packed in the same container.

- B. Inventory hardware jointly with representatives of the hardware supplier and the hardware installer until each is satisfied that the count is correct.
- C. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control and handling and installation of hardware items that is not immediately replaceable, so that the completion of the work will not be delayed by the hardware losses, both before and after installation.

1.6 JOB CONDITIONS:

- A. Coordination: Coordinate hardware with other work. Tag each item or package separately, with identification related to the final hardware schedule, and include basic installation instructions in the package. Furnish hardware items of proper design for use on doors and frames of the thicknesses, profile, swing, security and similar requirements indicated, as necessary for proper installation and function. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation.
- B. Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check the shop drawings of such other work, to confirm that adequate provisions are made for the proper installation of hardware.

PART 2 - PRODUCTS

2.1 SCHEDULE HARDWARE:

- A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of builders hardware is indicated in the Hardware Schedule at the end of this section. Products are identified by using hardware designation numbers of the following:
 - 1. Manufacturer's product designations: One or more manufacturers are listed for each hardware type required. Provide either the product designated, or, where more than one manufacturer is listed, the comparable product of one of the other manufacturers that comply with requirements including those specified elsewhere in this section.

2.2 MATERIALS AND FABRICATIONS:

- A. General:
 - 1. Hand of door: The drawings show the direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of the door movement as shown.
 - 2. Base Metals: Produce hardware units of the basic metal and forming methods indicated, using the manufacturer's standard metal alloy, composition, temper and

hardness, but in no case of lesser (commercially recognized) quality than specified for the applicable hardware units by FS FF-H-106, FS FF-G-111, FS FF-H-116 and FS FF-H-121. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.

3. Fasteners: Manufacture hardware to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.
4. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match the hardware finish or, if exposed in surfaces of other work, to match the finish of such other work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.
5. Provide concealed fasteners for hardware units which are exposed when the door is closed, except to the extent no standard units of the type specified are available with concealed fasteners. Do not use through bolts for installation where the bolt head or the nut on the opposite face is exposed in other work, except where it is not feasible to adequately reinforce the work.
6. Tools for Maintenance: Furnish a complete set of specialized tools as needed for Owner's continued adjustment, maintenance, and removal and replacement of builders hardware.

2.3 HINGES, BUTTS AND PIVOT:

- A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
- B. Screws: Furnish Phillips flat-head all-purpose or machine screws for installation of units, except furnish Phillips flat-head all-purpose or wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.
- C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
 1. Non-ferrous Hinges: Stainless steel pins.
 2. Exterior Doors: Non-ferrous & non-removable pins.
 3. Out-swing Corridor Doors: Non-removable pins.
 4. Interior Doors: Non-rising pins.

5. Tips: Flat button and matching plug, finished to match leaves.
6. Number of hinges: Provide number of hinges indicated but not less than 3 hinges for door leaf for doors 90" or less in height and one additional hinge for each 30" of additional height.

2.4 LOCK CYLINDERS AND KEYING:

- A. General: Best Locking System will meet with Owner to finalize keying requirements and obtain final instructions in writing.
- B. Existing System: Key the locks to the Owner's existing Best Lock system, with a new masterkey for the project.
- C. Equip locks with manufacturer's standard 6 or 7-pin tumbler cylinders as required by owner..
- D. Furnish temporary cores for all exterior.
- E. Metals: Construct lock cylinder parts from brass/bronze, stainless steel or nickel silver.
- F. Key Material: Provide keys of nickel silver only.
- G. Key Quantity: Furnish 3 change keys for each lock; 5 master keys for each master system; and 5 grandmaster keys for each grandmaster system.
 1. Deliver keys to Owner's representative and obtain receipt.

2.5 LOCKS, LATCHES AND BOLTS:

- A. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set.
- B. Lock Throw: Provide 5/8" minimum throw of latch and deadbolt used on pairs of doors. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.
 1. Provide 1/2" minimum throw on other latch and deadlock bolts.

2.7 CLOSERS AND DOOR CONTROL DEVICES:

- A. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use.
 - 1. Where parallel arms are indicated for closers, provide closer unit one size larger than recommended for use with standard arms.

2.8 MISCELLANEOUS COMPONENTS:

- A. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units (kick plates, edge trim and similar units); either machine screws or self-tapping screws.
- B. Fabricate protection plates (armor, kick or mop) on stop side not more than 2" smaller than the door width, x 8" in height
- C. Weatherstrip and Thresholds: Extruded aluminum, size and profiles indicated.

2.9 HARDWARE FINISHES:

- A. Provide matching finishes for hardware units at each door or opening, to the greatest extent possible, and except as otherwise indicated. Reduce differences in color and textures as much as commercially possible where the base metal or metal forming process is different for individual units of hardware exposed at the same door or opening. In general, match items to the manufacturer's standard finish for the latch and lock set (or push-pull units if no latch-lock sets) for color texture.
- B. Provide finishes which match those established by BHMA or, if none established, match the Architect's sample.
- C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standards, but in no case less than specified for the applicable units of hardware by referenced standards.
- D. Provide protective lacquer coating on all exposed hardware finishes of brass, bronze and aluminum, except as otherwise indicated. The suffix "-NL" is used with standard finish designations to indicate "no lacquer".
- E. The designations used in schedules and elsewhere to indicate hardware finishes are the industry-recognized standard commercial finishes, except as otherwise noted.
- F. General Hardware finish: US26D or US32D as specified.
- G. Aluminum finish: Clear Anodized or as specified

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Mount hardware units at heights indicated in "Recommended Location for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by Architect.
- B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protections with finishing work specified in the Division 9 sections. Do not install surface-mounted items until finishes have been completed on the substrate.
- C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- D. Drill and countersink units that are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

3.2 ADJUST AND CLEAN:

- A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly as intended for the application made.
- B. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- C. Instruct Owner's Personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.
- D. Continued Maintenance Service: Approximately six months after the acceptance of hardware in each area, the Installer, accompanied by the representative of the latch and lock manufacturer, shall return to the project and re-adjust every item of hardware to restore proper function to doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items that have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

4.0 HARDWARE SETS

Hardware Set 1

Door mark 120 (RELOCATED)

Each to Receive:

1	EA	EXIT DEVICE	8810 (Exit only)	US32D	SARGENT
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Hardware Set 2

Door mark 123, 127 & 137

Each to Receive:

3	EA	FULL MORT HINGE	1279 4 1/2" X 4 1/2"	US26D	HAGER
1	EA	LOCKSET	93K-7AB-15C (Office)	US26D	BEST LOCK
1	EA	FLOOR STOP	243F	US26D	HAGER
3	EA	SILENCER	307D	GREY	HAGER

Hardware Set 3

Door mark 124 & 130

Each to Receive:

3	EA	FULL MORT HINGE	BB1279 4 1/2" X 4 1/2"	US26D	HAGER
1	EA	PUSH PLATE	30S 4" X 16"	US32D	HAGER
1	EA	PULL PLATE	33E 4" X 16"	US32D	HAGER
1	EA	CLOSER	EN1431 –UO x SNB		SARGENT
1	EA	FLOOR STOP	243F	US26D	HAGER
3	EA	SILENCER	307D	GREY	HAGER

Hardware Set 4

Door mark 129

Each to Receive:

6	EA	FULL MORT HINGE	1279 4 1/2" X 4 1/2"	US26D	HAGER
2	EA	FLUSH BOLT	283D	US26D	HAGER
1	EA	LOCKSET	93K-7D-15C (Storeroom)	US26D	BEST LOCK
1	EA	CLOSER	EN1431 –UO x SNB		SARGENT
3	EA	SILENCER	307D	GREY	HAGER

Hardware Set 5

Door mark 126

Each to Receive:

3	EA	FULL MORT HINGE	1279 4 1/2" X 4 1/2"	US26D	HAGER
1	EA	LOCKSET	93K-7D-15C (Storeroom)	US26D	BEST LOCK
1	EA	DEADBOLT	83T-7K	US26D	BEST LOCK
3	EA	SILENCER	307D	GREY	HAGER

END OF SECTION

SECTION 08800

GLASS AND GLAZING

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK:

- A. Extent of glass and glazing work is shown on drawings.
- B. Definitions: "Glass" includes prime glass, processed glass, and fabricated glass products. "Glazing" includes glass installation and materials used to install glass. Types of work in this section include glass and glazing for:
 - 1. Window units, not indicated as "preglazed".
 - 2. Entrances and other doors, not indicated as "preglazed".
 - 3. Interior partitions.
- C. "Glass products" is hereby defined to include glazing plastics.

1.3 QUALITY ASSURANCE:

- A. Prime Glass Manufacturer: One of the following for each type/color/ pattern of glass:
 - ASG Industries, Inc.
 - C-E Glass Division
 - Ford Glass Company
 - Libbey-Owens-Ford Company
 - PPG Industries, Inc.
- B. Prime Glass Standard: FS DD-G-451.
- C. Safety Glass Standard: CPSC 16 CFR 1201.

1.4 SUBMITTALS:

- A. Samples: 2 samples, 12" square, of each glass product, except for clear single-pane units.

1.5 JOB CONDITIONS:

- A. Pre-Installation: Meet with Glazier and other trades affected by glass installation, prior to beginning of installation. Do not perform work under adverse job conditions. Install liquid sealants when temperatures are within lower or middle third of temperature range recommended by manufacturer.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS:

- A. Float/Plate Glass: Type I, Quality q3 clear unless otherwise indicated.
- B. 9/16" Impact resistant glazing at storefront and entrances.

2.2 PROCESSED GLASS:

- A. Tempered Glass; Provide prime glass of color and type indicated, which has been heat treated to strengthen glass in bending to not less than 4.5 times annealed strength.
- B. Mirror Glass: 1/4" Quality q2 clear float glass; full silver coating, copper coating and organic coating.

2.3 FABRICATED GLASS UNITS:

- A. Interior Glass: Clear float glass, Quality q3, 1/4" thick.
- B. Edge Construction: Twin primary seals of polyisobutylene; tubular aluminum or galvanized steel spacer-bar frame with welded or soldered sealed corners, and filled with dessicant; and secondary seal outside of bar, bonded to both sheets of glass and bar, of polysulfide, silicone or hot-melt butyl elastomeric sealant (fabricator's options).

2.4 MIRRORS:

- A. Mirror Glass: 1/4" thick, Type I, Class 1, Quality q2, conforming to FS DD-G-451, with silvering, copper coating, and protective organic coating complying with FS DD-M-411.
 - 1. Mirror Edges: Polished.
 - 2. Mirror Hangers: Concealed tamperproof clips.

2.5 GLAZING SEALANTS AND COMPONENTS:

- A. General: Provide color of exposed sealant/compound indicated or if not otherwise indicated, as selected by Architect from manufacturer's standard colors, or black if no color is so selected. Comply with manufacturer's recommendations for selection of hardness, depending upon the location of each application, conditions at time of installation, and performance requirements as indicated. Select materials, and variations or modifications, carefully for compatibility with surfaces contacted in the installation.

2.6 GLAZING GASKETS:

- A. Molded Neoprene Glazing Gaskets: Molded or extended neoprene gaskets of the profile and hardness required for watertight construction; comply with ASTM D 2000 designation 2BC 415 to 3BC 62U, black.

PART 3 - EXECUTION

3.1 STANDARDS AND PERFORMANCE:

- A. Airtight installation of each glass product is required, except as otherwise shown. Each installation must withstand normal temperature changes, impact loading (for operating sash and doors), without failure including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the work.
- B. Protect glass from edge damage during handling and installation, and subsequent operation of glazed components of the work. During installation, discard unit with significant edge damage or other imperfections.
- C. Glazing channel dimensions as shown are intended to provide for necessary bite on glass, minimum edge clearance, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by job conditions at time of installation

3.2 PREPARATION FOR GLAZING:

- A. Clean glazing channels and other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to substrates. Remove lacquer from metal surfaces where elastomeric sealants are indicated for use.
- B. Apply primer or sealant to joint surfaces where recommended by sealant manufacturer.

3.3 GLAZING:

- A. Install setting blocks of proper size in sill rabbet, located 1/4th of glass width from each corner. Set blocks in thin course of heel- bead, if any.
- B. Force sealants into channel to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.
- C. Clean and trim excess glazing materials from glass and stops or frames promptly after installation, and eliminate stains and discolorations.
- D. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when installation is subjected to movement. Anchor gasket to stop with matching ribs, or by proven adhesives, including embedment of gasket tail in cured heel head.
- E. Gasket Glazing: Miter cut and bond ends together at corners where gaskets are used for channel glazing, so that gaskets will not pull away from corners and result in voids or leaks in glazing system.

3.4 CURE, PROTECTION AND CLEANING:

- A. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.
- B. Clean glass on both faces not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion in each area of project. Comply with glass product manufacturer's recommendations for final cleaning.

3.5 MIRROR INSTALLATION:

- A. Secure mirrors to walls in tamperproof manner with special hangers, toggle bolts, or screws. Set units plumb, level, and square at locations indicated, in accordance with manufacturer's instructions for type of substrate involved.
- B. Clean exposed surfaces of mirror units in compliance with manufacturer's recommendations.

END OF SECTION

SECTION 09250

GYPSUM DRYWALL

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor materials, equipment and services necessary to complete the gypsum drywall as shown on the drawings and/or specified herein, including, but is not limited to, the following:
 - 1. Gypsum board work for partitions, ceilings, column enclosures, furring, and elsewhere where gypsum drywall work is shown on drawings.
 - 2. Metal supports for gypsum drywall construction.
 - 3. Acoustical insulation for gypsum drywall work.
 - 4. Sealant for gypsum drywall work.
 - 5. Concealed metal reinforcing for attachment of railings, toilet partitions and other items supported on drywall partitions and walls.
 - 6. Taping and finishing of drywall joints.
 - 7. Installing rings and frames in drywall surfaces for grilles, registers and lighting fixtures.
 - 8. Bracing and connections.

1.3 RELATED SECTIONS

- A. Thermal Insulation - Section 07210.
- B. Hollow metal door frames - Section 08100.
- C. Access doors - Section 08305.
- D. Painting - Section 09900.

1.4 QUALITY ASSURANCE

- A. The following standards as well as other standards which may be referred to in this Section, shall apply to the work of this Section:
1. Gypsum Drywall Construction Handbook, latest edition, U.S. Gypsum Co.
 2. ASTM C645 "Standard Specification for Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels For Screw Application of Gypsum Board".
 3. ASTM A568 "Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements For".
 4. ASTM C1396 "Specification for Gypsum Board".
 5. ASTM C442 "Specification for Gypsum Backing Board and Coreboard".
 6. ASTM C475 "Standard Specification for Joint Treatment Materials For Gypsum Wallboard Construction".
 7. ASTM C840 "Standard Specification for Application and Finishing of Gypsum Board".
 8. ASTM C919 "Standard Specification for Use of Sealants in Acoustical Applications".
 9. ASTM C954 "Standard Specification for Steel Drill Screws For the Application of Gypsum Board or Metal Plaster Bases to Steel Studs From 0.033 in. to 0.112 in. in Thickness".
 10. ASTM C1002 "Standard Specification for Steel Drill Screws For the Application of Gypsum Board".
 11. ASTM C754 "Standard Specification for Installation of Steel Framing Members to Receive Screw Attached Gypsum Board".
- B. Allowable Tolerances: 1/32" offsets between planes of board faces, and 1/16" in 8'-0" for plumb, level, warp and bow.
- C. System Design Load
1. Provide standard drywall assemblies designed and tested by manufacturer to withstand a lateral load of 5 lbs. per sq. ft. for the maximum wall height required, and with deflection limited to 1/240 of partition height.

- a. Drywall assemblies with tile finish shall have a deflection limit of 1/360.
- D. Fire-Resistance Rating: Where gypsum drywall with fire resistance ratings are indicated, provide materials and installations which are identical with those of applicable assemblies tested per ASTM E119 by fire testing laboratories, or to design designations in UL "Fire Resistance Directory" or in listing of other testing agencies acceptable to authorities having jurisdiction.
- E. Installer: Firm with not less than 5 years of successful experience in the installation of specified materials.

1.5 SUBMITTALS

- A. Submit shop drawing for each drywall partition, furring and ceiling system showing size and gauges of framing members, hanger and anchorage devices, wallboard types, insulation, sealant, methods of assembly and fastening, control joints indicating column lines, corner details, joint finishing and relationship of drywall work to adjacent work.
- B. Samples: Each material specified herein, 12" x 12", or 12" long, or in manufacturer's container, as applicable for type of material submitted.
- C. Manufacturer's Literature: Submit technical and installation instructions for each drywall partition, furring and ceiling system specified herein, and for each fire rating and sound rating gypsum board assembly. Submit other data as required to show compliance with these specifications.
- D. Test Reports: This Contractor shall submit test report, obtained by drywall manufacturer, indicating conformance of drywall assemblies to required fire ratings and sound ratings.

1.6 PRODUCT HANDLING AND PROTECTION

- A. Deliver, store and handle drywall work materials to prevent damage. Deliver materials in their original, unopened containers or bundles, and store where protected from moisture, damage and from exposure to the elements. Store wallboard in flat stacks.
- B. Protect wallboard from becoming wet.

1.7 ENVIRONMENTAL CONDITIONS

- A. Provide and maintain minimum temperature of fifty five (55) degrees F. and adequate ventilation to eliminate excessive moisture within the building in the area of the drywall work for at least twenty four (24) hours, prior to, during and after installation of drywall work. Installation shall not start until windows are glazed and doors are installed, unless openings are temporarily closed. Space

above suspended ceilings shall be vented sufficiently to prevent temperature and pressure build up.

1.8 JOB MOCK-UP

- A. At a suitable location, where directed by the Architect, lay up a portion of a finished wall and ceiling demonstrating the quality of work, including finishing, to be obtained under this Section. Omit drywall boards in locations as directed by the Architect to show stud spacing and attachments; after acceptance, complete assembly.
- B. Adjust the finishing techniques as required to achieve the finish required by the Architect as described in this Section of these specifications.
- C. Upon approval of the mock-up, the mock-up may be left in place as a portion of the finished work of this Section.
- D. All drywall work shall be equal in quality to approved mock-up.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Materials specified below, unless noted otherwise or specified herein, are those of U.S. Gypsum Co. Equivalent materials of National Gypsum Co., Georgia Pacific and Domtar meeting specification requirements are acceptable.

2.2 METAL SUPPORTS

- A. Metal Floor and Ceiling Runners – Interior Walls
 - 1. Channel Type: Formed from 20 U.S. Std. gauge (unless otherwise noted) galvanized steel, width to suit channel type metal studs. Use 20 ga. top runners with 1-1/4" minimum flanges.
 - 2. Ceiling runners at fire rated partitions shall be "Fire Trak" made by the Fire Trak Corp. fabricated of 20 ga. galvanized steel.
- B. Metal Studs, Framing and Furring – Interior Walls
 - 1. Channel Type Studs: Channel type with holes for passage of conduit formed from minimum 20 U.S. Std. gauge. (unless heavier gauge required to meet deflection limits) galvanized steel, width as shown on drawings.
 - 2. Furring Channels: Hat shaped, formed from galvanized steel, 25 U.S. Std. gauge.

3. Continuous 16 gauge x 8" wide steel wall plate screwed to studs as required for support of railings, toilet partitions and other items supported on drywall partitions and walls.

C. Suspended Ceiling and Fascia Supports

1. Main Runners: 1-1/2" steel channels, cold rolled at 0.475 lbs. per ft., rust -inhibitive paint finish.
2. Furring Members: Screw-type hat-shaped furring channels of 25 ga. zinc-coated steel; comply with ASTM C645.
3. Hangers: Galvanized, 1" x 3/16" flat steel slats capable of supporting 5x calculated load supported.
4. Hanger Anchorages: Provide inserts, clips, bolts, screws and other devices applicable to the required method of structural anchorage for ceiling hangers. Size devices for 5x calculated load supported.
5. Furring Anchorages: 16 ga. galvanized wire ties, manufacturer's standard clips, bolts or screws as recommended by furring manufacturer.

2.3 GYPSUM WALLBOARDS

- A. Gypsum Wall Board: ~~1/2"~~, 5/8" ~~& 3/4"~~ thick as indicated on drawings, "Sheetrock", 48" wide, in maximum lengths available to minimize end to end butt joints.
- B. Fire Rated Gypsum Wall Board: 1/2" thick and 5/8" thick as indicated on drawings, "Sheetrock Firecode C", 48" wide, in maximum lengths available to minimize end to end butt joints.
- C. Water Resistant Gypsum Wall Board (for tile finish and for non-tile areas in toilet rooms, Janitor's closets): 1/2" thick and 5/8" thick as indicated on drawings, "Sheetrock W/R" or "Sheetrock Firecode C W/R", 48" wide, in maximum lengths available to minimize end to end butt joints.
- D. Gypsum Sheathing: 1/2" thick "Dens-Glass Gold", by Georgia Pacific or equal made by U.S. Gypsum Co. or National Gypsum meeting the following criteria:

Surfacing	Inorganic glass fiber mat
Racking Strength, lbs./ft. (dry) (Ultimate-not design value)	617
Flexural strength, parallel, lbs. (4' week direction)	80
Humidified Deflection, inches	2/8

Surface Water Absorption, grams	.84
Permeance (perms)	23 (est.)
“R” Value	.56
Flame Spread	0
Combustible	
Core	no
Mat	no

- E. Fasteners: 1-1/4" Type S-12 screws "Climaseal" finish.
- F. Joint Treatment: Provide Dow Corning 795 Building Sealant or approved equal sealant. Apply a 3/8" bead of sealant to the joint and trowel flat. Apply enough of the same material to each fastener to cover completely when trowel flat.
- G. Air Barrier: “Commercial Tyvek” by DuPont or approved equal fastened to sheathing with 1/2" crown, 3/8" leg galvanized staples.
- H. Gypsum Roof Deck Sheathing: 1/2" thick “Dens-Deck Roof Guard”, by Georgia Pacific or equal made by U.S. Gypsum Co. or National Gypsum.

Surfacing	Inorganic glass fiber mat
Weight, lbs/sq. ft. nominal	1.95
Surfacing	Glass Mat
Flexural strength, parallel, lbs. (4' week direction)	80
Flute Spanability	5"
Permeance, Perms	35
Water Absorption, % max	10.0
Surface Water Absorption, grams	2.5
“R” Value	.56
Flame Spread	0
Combustible	
Core	no
Mat	no

2.4 ACCESSORIES

- A. Acoustic Insulation: See Section 07210 Article 2.3.C.
- B. Fasteners for Wall Board: USG Brand Screws; Type S Bugle Head for fastening wallboard to lighter gauge interior metal framing (up to 20 ga.). Type S-12 Bugle Head for fastening wallboard to heavier gauge interior metal framing (20 ga. to 12 ga.); Type S and Type S-12 Pan Head for attaching metal studs to door frames and runners; and Type G Bugle Head for fastening

wallboard to wall board. Lengths specified below under "Part 3 - Execution" Articles and as recommended by drywall manufacturer.

1. Screws used for fastening water resistant backer boards to receive tile finish shall have corrosion resistant finish.
- C. Laminating Adhesive: "Perf-A-Joint Compound Taping".
- D. Metal Trim - Corner Beads: For 90 degree External Corners - "Dur-A-Bead" No. 103, 27 U.S. Std. ga. galvanized steel, 1-1/4" x 1-1/4", for 90 degree external corners.
- E. Metal Trim - Edge Beads: "Metal Trim No. 200-A", 28 U.S. Std ga. galvanized steel, channel type, or "Metal Trim No 200- B", L type, where use of channel type (200--A) not possible.
- F. Metal Trim Treatment Materials and Joint Treatment Materials for Gypsum Drywall Boards: "Perf-A-Tape" for joint reinforcing; "Durabond 90 Joint Compound-Multi-Purpose" for taping and topping; and "Ready Mixed Compound-Topping" for finishing.
- G. Water: Clean, fresh and suitable for drinking.
- H. Control Joints: No. 93, USG.
- I. Acoustical Sealant: USG "Acoustical Sealant" or "Tremco Acoustical Caulking" of Tremco Mfg. Co., or approved equal.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where gypsum drywall is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 GENERAL INSTALLATION REQUIREMENTS

- A. General
 1. Install drywall work in accordance with drywall manufacturer's printed instructions and as indicated on drawings and specified herein.
 2. All metal framing for drywall partitions shall extend from floor to underside of structural deck above.

3. Spot-grout in metal door frames at the jamb-anchor clips with joint compound after the studs are installed and just before the wallboard is installed. If second layer of wallboard is indicated, rake out compound after installing first layer of wallboard. Grout frames in solid for door jambs where indicated.
 4. Provide concealed reinforcement, 16 ga. thick by eight (8) inches wide or as detailed or as recommended by manufacturer, for attachment of railings, toilet partitions, and other items to be supported on the partitions which cannot be attached to the metal framing members. Concealed reinforcement shall span between metal studs and be attached thereto using two (2) self-tapping pan head screws at each stud.
 - a. Back of drywall shall be scored or notched to prevent bulging out where reinforcement plate occurs.
- B. Fire-Rated Assemblies: Install fire-rated assemblies in accordance with requirements of authorities having jurisdiction, Underwriters' Laboratories and test results obtained and published by the drywall manufacturer, for the fire-rated drywall assembly types indicated on the drawings.
- C. Sealant
1. Install continuous acoustical sealant bead at top and bottom edges of wallboard where indicated or required for sound rating as wallboard is installed, and between metal trim edge beads and abutting construction.
 2. Install acoustical sealant in 1/8" wide vertical control joints within the length of the wall or partitions, and in all other joints, specified below under "Control Joints". Install bead of acoustical sealant around electric switch and outlet boxes, piping, ducts, and around any other penetration in the wallboard; place sealant bead between penetrations and edge of wallboard.
 3. Where sealant is exposed to view, protect adjacent surfaces from damage and from sealant material, and tool sealant flush with and in same plane as wallboard surface. Sealant beads shall be 1/4" to 3/8" diameter.
- D. Wall Board Application
1. See drawings for all board types. Use fire-rated wallboard for fire rated assemblies. Use water-resistant wallboard where indicated on drawings and where wallboard would be subject to moisture. Install water-resistant wallboard in full, large sheets (no scraps) to limit number of butt joints.
 2. Apply wallboard with long dimension parallel to stud framing members, and with abutting edges occurring over stud flanges.

3. Install wallboard for partitions from floor to underside of structure above and secure rigidly in place by screw attachment, unless otherwise indicated.
 4. Provide "Thermafiber" safing insulation ~~meeting standards of Section 07840~~ at flutes of metal deck where partitions carry up to bottom of metal deck.
 5. Neatly cut wallboard to fit around outlets, switch boxes, framed openings, piping, ducts, and other items which penetrate wallboard; fill gaps with acoustic sealant.
 6. Where wallboard is to be applied to curved surfaces, dampen wallboard on back side as required to obtain required curve. Finish surface shall present smooth, even curve without fluting or other imperfections.
 7. Screw fasten wallboard with power-driven electric screw driver, screw heads to slightly depress surface of wallboard without cutting paper, screws not closer than 3/8" from ends and edges of wallboard.
 8. Where studs are doubled-up, screw fasten wallboard to both studs in a staggered pattern.
- E. Metal Trim: Install and mechanically secure in accordance with manufacturer's instructions; and finish with three (3) coats of joint compound, feathered and finish sanded smooth with adjacent wallboard surface, in accordance with manufacturer's instructions.
1. Corner Beads: Install specified corner beads in single lengths at all external corners, unless corner lengths exceed standard stock lengths.
 2. Edge Beads: Install specified edge beads in single lengths at all terminating edges of wallboard exposed to view, where edges abut dissimilar materials, where edges would be exposed to view, and elsewhere where shown on drawings. Where indicated on drawings, seal joint between metal edge bead and adjoining surface with specified gasket, 1/8" wide minimum and set back 1/8" from face of wallboard, unless other size and profile indicated on drawings.
 3. Casing beads shall be set in long lengths, neatly butted at joints. Provide casing beads at juncture of board and vertical surfaces and at exposed perimeters.
- F. Control Joint Locations: Gypsum board surfaces shall be isolated with control joints where:
1. Ceiling abuts a structural element, dissimilar wall or other vertical penetration.

2. Construction changes within the plane of the partition or ceiling.
3. Shown on approved shop drawings.
4. Ceiling dimensions exceed thirty (30) feet in either direction.
5. Wings of "L", "U", and "T" shaped ceiling areas are joined.
6. Expansion or control joints occur in the structural elements of the building.
7. Partition or furring abuts a structural element or dissimilar wall or ceiling.
8. Partition or furring runs exceed 30' without interruption.
9. Where control joints are required, ceiling height door frames may be used as control joints. Less than ceiling height frames shall have control joints extending to the ceiling from both corners.

G. Joint Treatment and Spackling

1. Joints between face wallboards in the same plane, joints at internal corners of intersecting partitions and joints at internal corners of intersections between ceilings and walls or partitions shall be filled with joint compound.
2. Screw heads and other depressions shall be filled with joint compound. Joint compound shall be applied in three (3) coats, feathered and finish surface sanded smooth with adjacent wallboard surface, in accordance with manufacturer's instructions. Treatment of joints and screw heads with joint compound is also required where wallboard will be covered by finish materials which require a smooth surface, such as vinyl wall coverings.

3.3 FURRED WALLS AND PARTITIONS

- A. Use specified metal furring channels. Run metal furring channel framing members vertically, space twenty four (24) inches o.c. maximum. Fasten furring channels to concrete or masonry surfaces with power-driven fasteners or concrete stub nails spaced twenty four (24) inches o.c. maximum through alternate wing flanges (staggered) of furring channel. Furring channels shall be shimmed as necessary to provide a plumb and level backing for wallboard. At inside of exterior walls, an asphalt felt protection strip shall be installed between each furring channel and the wall. Furring channel and splices shall be provided by nesting channels at least eight (8) inches and securely anchoring to concrete or masonry with two (2) fasteners in each wing.
- B. Wallboard Installation: Same as specified under Article 3.4 - "Metal Stud Partitions".

3.4 METAL STUD PARTITIONS

- A. Runner Installation: Use channel type. Align accurately at floor according to partition layout. Anchor runners securely sixteen (16) inches o.c. maximum with power driven anchors to floor slab, with power-driven anchors to structural slab above. See "Stud Installation" below for runners over heads of metal door frames. Where required, carefully remove sprayed-on fireproofing to allow partition to be properly installed.
- B. Stud Installation
1. Use channel type, positioned vertically in runners, spaced as noted on drawings, but not more than twenty four (24) inches o.c. At toilet areas and all gypsum drywall partitions indicated to receive ceramic tile, space studs sixteen (16) inches o.c.
 2. Anchor studs to floor runners with screw fasteners. Provide snap-in or slotted hole slip joint bolt connections of studs to ceiling runners leaving space for movement. Anchor studs at partition intersections, partition corners and where partition abuts other construction to floor and ceiling runners with sheet metal screws through each stud flange and runner flange.
 3. Connection at ceiling runner for non-rated partitions shall be snap-in or slotted hole slip joint bolt connection that shall allow for movement. Seal studs abutting other construction with 1/8" thick neoprene gasket continuously between stud and abutting construction.
 4. Install metal stud horizontal bracing wherever vertical studs are cut or wallboard is cut for passage of pipes, ducts or other penetrations, and anchor horizontal bracing to vertical studs with sheet metal screws.
 5. At jambs of door frames and borrow light frames, install doubled-up studs (not back to back) from floor to underside of structural deck, and securely anchor studs to jamb anchors of frames and to runners with screws. Provide cross braces from hollow metal frames to underside of slab.
 6. Over heads of door frames install cut-to-length section of runner with flanges slit and web bent to allow flanges to overlap adjacent vertical studs, and securely anchor runner to adjacent vertical studs with sheet metal screws. Install cut-to-length vertical studs from runner (over heads of door frame) to ceiling runner sixteen (16) inches maximum o.c. and at vertical joints of wallboard, and securely anchor studs to runners with sheet metal screws.
 7. At control joints, in field of partition, install double-up studs (back to back) from floor to ceiling runner, with 1/4" thick continuous compressible gasket between studs. When necessary, splice studs with eight (8) inches

minimum nested laps and attach flanges together with two (2) sheet metal screws in each flange. All screws shall be self-tapping sheet metal screws.

- C. Runners and Studs at Chase Wall: As specified above for "Runners" and "Studs" and as specified herein. Chase walls shall have either a single or double row of floor and ceiling runners with metal studs sixteen (16) inches o.c. maximum and positioned vertically in the runners so that the studs are opposite each other in pairs with the flanges pointing in the same direction. Anchor all studs to runner flanges with sheet metal screws through each stud flange and runner flange following requirements of paragraph 3.4, B. Provide cross bracing between the rows of studs by attaching runner channels or studs set full width of chase attached to vertical studs with one self-tapping screw at each end. Space cross bracing not over thirty six (36) inches o.c. vertically.
- D. Wallboard Installation - Single Layer Application (Screw Attached)
1. Install wallboard with long dimension parallel to framing member and with abutting edge joints over web of framing member. Install wallboard with long dimension perpendicular to framing members above and below openings in drywall extending to second stud at each side of opening. Joints on opposite sides of wall shall be arranged so as to occur on different studs.
 2. Boards shall be fastened securely to metal studs with screws as specified. Where a free end occurs between studs, back blocking shall be required. Center abutting ends over studs. Correct work as necessary so that faces of boards are flush, smooth, true.
 3. Wallboard screws shall be applied with an electric screw gun. Screws shall be driven not less than 3/8" from ends or edges of board to provide uniform dimple not over 1/32" deep. Screws shall be spaced twelve (12) inches o.c. in the field of the board and 8" o.c. staggered along the abutting edges.
 4. All ends and edges of wallboard shall occur over screwing members (studs or furring channels). Boards shall be brought into contact but shall not be forced into place. Where ends or edges abut, they shall be staggered. Joints on opposite sides of a partition shall be so arranged as to occur on different studs.
 5. At locations where piping receptacles, conduit, switches, etc., penetrate drywall partitions, provide non-drying sealant and an approved sealant stop at cut board locations inside partition.
- E. Wallboard Installation - Double-Layer Application
1. General: See drawings for wallboard partition types required.

2. First Layer (Screw Attached): Install as described above for single layer application.
 3. Second Layer (Screw Attached): Screw attach second layer, unless laminating method of attachment indicated on drawings or necessary to obtain required sound rating or fire rating. Install wallboard vertically with vertical joints offset thirty four (34) inches from first layer joints and staggered on opposite sides of wall. Attach wallboard with 1-5/8" screws sixteen (16) inches o.c. along vertical joints and sixteen (16) inches o.c. in the field of the wallboard. Screw through first layer into metal framing members.
 4. Second Layer (Laminated): Install wallboard vertically. Stagger joints of second layer from first layer joints. Laminate second layer with specified laminating adhesive in beads or strips running continuously from floor to ceiling in accordance with manufacturer's instruction. After laminating, screw wallboard to framing members with 1-5/8" screws, spaced twelve (12) inches o.c. around perimeter of wallboard.
- F. Wallboard Installation - Laminated Application: Where laminated wallboard is indicated, use specified laminating adhesive, install wallboard vertically and maintain tolerances as specified for screw attached wallboard.
- G. Insulation Installation: Install where indicated on drawings. Place blanket tightly between studs.
- H. Deflection of Structure Above: To allow for possible deflection of structure above partitions, provide top runners for non-rated partitions with 1-1/4" minimum flanges and do not screw studs or drywall to top runner. Where positive anchorage of studs to top runner is required, anchorage device shall be by means of slotted hole in stud and bolted fastener, or other anchorage device approved by Architect.
- I. Control Joints
1. Leave a 1/2" continuous opening between gypsum boards for insertion of surface mounted joint.
 2. Back by double framing members.
 3. Attach control joint to face layer with 9/16" galvanized staples six (6) inches o.c. at both flanges along entire length of joint.
 4. Provide two (2) inch wide gypsum panel strip or other adequate seal behind control joint in fire rated partitions and partitions with safig insulation.

3.5 DRYWALL FASCIAS AND CEILINGS

- A. Furnish and install inserts, hanger clips and similar devices in coordination with other work.
- B. Secure hangers to inserts and clips. Clamp or bolt hangers to main runners.
- C. Space main runners 4'-0" o.c. and space hangers 4'-0" o.c. along runners, except as otherwise shown.
- D. Level main runners to a tolerance of 1/4" in 12'-0", measured both lengthwise on each runner and transversely between parallel runners.
- E. Metal Furring Channels: Space sixteen (16) inches o.c. maximum. Attach to 1-1/2" main runner channels with furring channel clips (on alternate sides of main runner channels) or with two (2) strands of sixteen (16) ga. galvanized soft steel tie wire (saddle tied to main runner channel). Furring channels shall not be let into or come in contact with abutting masonry walls. End splices shall be provided by nesting furring channels no less than eight (8) inches and securely wire tying. At any openings that interrupt the furring channels, install additional cross reinforcing to restore lateral stability.
- F. Mechanical accessories, hangers, splices, runner channels and other members used in suspension system shall be of metal, zinc coated, or coated with rust inhibitive paint, of suitable design of adequate strength to support units securely without sagging, and such as to bring unit faces to finished indicated lines and levels.
 - 1. Provide special furring where ducts are over two (2) feet wide.
- G. Apply board with its long dimension at right angles to channels. Locate board butt joints over center of furring channels. Attach board with one (1) inch self-drilling drywall screws twelve (12) inches o.c. in field of board; eight (8) inches o.c. at butt joints located not less than 3/8" from edges.

3.6 ERECTION AT COLUMN ENCLOSURES

- A. Metal furring supports shall be provided under work of this Section, and shall be cut to lengths as necessary for tight fit such that spacing is not more than sixteen (16) inches o.c.
- B. Board shall be fastened securely to supports with screws as specified. Place boards in position with minimum amount of joints. Where free ends occur between supports, back-blocking or furring shall be required. Center abutting ends over supports. Correct work as necessary so that faces of boards are flush, smooth and true. Provide clips or cross furring for attachment as required.
- C. All layers shall be screw attached to furring.

- D. When column finish called for on drawings to be in the same plane as drywall finish layer, maintain even, level plane.

3.7 FINISHING

- A. Taping: A thin, uniform layer of taping compound shall be applied to all joints and angles to be reinforced. Reinforcing tape shall be applied immediately, centered over the joint, seated into the compound. A skim coat shall follow immediately, but shall not function as a fill or second coat. Tape shall be properly folded and embedded in all angles to provide a true angle.
- B. Filling: After taping compound has hardened, topping compound shall be applied, filling the board taper flush with the surface. The fill coat shall cover the tape and feather out slightly beyond the tape. On joints with no taper, the fill coat shall cover the tape and feather out at least four (4) inches on either side of the tape. No fill coat is necessary on interior angles.
- C. After topping compound is set, a finishing coat of topping compound shall be spread evenly over and extending slightly beyond the fill coat on all joints and feathered to a smooth, uniform finish. Over tapered edges, the finished joint shall not protrude beyond the plane of the surface. All taped angles shall receive a finish coat to cover the tape and taping compound, and provide a true angle. Where necessary, sanding shall be done between coats and following the final application of compound to provide a smooth surface, ready for painting.
- D. Fastener Depressions: Taping compound shall be applied to all fastener depressions followed, when hardened by at least two (2) coats of topping compound, leaving all depressions level with the plane of the surface.
- E. Finishing Beads and Trim: Taping compound shall be applied to all bead and trim and shall be feathered out from the ground to the plane of the surface. When hardened, this shall be followed by two (2) coats of topping compound each extending slightly beyond the previous coat. The finish coat shall be feathered from the ground to the plane of the surface and sanded as necessary to provide a flat, smooth surface ready for decoration.
- F. Level of finish shall conform to Level 4 of ASTM C840 and GA-214 of the Gypsum Association.
- G. Drywall construction with defects of such character which will mar appearance of finished work, or which is otherwise defective, will be rejected and shall be removed and replaced at no expense to the Owner.

3.8 CLEANING AND ADJUSTMENT

- A. At the completion of installation of the work, all rubbish shall be removed from the building leaving floors broom clean. Excess material, scaffolding, tools and other equipment shall be removed from the building.
- B. Work shall be left in clean condition ready for painting or wall covering. All work shall be as approved by Architect.
- C. Cutting and Repairing: Include all cutting, fitting and repairing of the work included herein in connection with all mechanical trades and all other trades which come in conjunction with any part of the work, and leave all work complete and perfect after all trades have completed their work.

3.9 PROTECTION OF WORK

- A. Installer shall advise Contractor of required procedures for protecting drywall work from damage and deterioration during remainder of construction period.

END OF SECTION

SECTION 09510

SUSPENDED ACOUSTICAL CEILING

PART 1 SCOPE

- 1.1 Furnish and install suspended acoustical ceiling system as shown and specified. Provide all labor, equipment, materials, operations and incidentals necessary to complete the work.

PART 2 MATERIALS

- 2.1 Acoustical materials shall be as manufactured by Armstrong Commercial Ceilings & Walls **or approved equal by Architect.**

2.2 Suspended Acoustical Ceiling:

- A. Acoustical Lay-In Tile: Fissured Lay-in, (width & depth as shown on plans) x 5/8", for 15/16" Prelude XL Exposed Tee System. Tile shall be white.
- B. Suspension System:
- a. Provide exposed "T" suspension system, hot-dipped galvanized steel, with low sheen color finish to match tile color (White) baked enamel finish equal to "Prelude XL", 15/16" exposed tee 2-way grid system made by Armstrong World Industries or equal made by U.S. Gypsum Co. or Chicago Metallic Corp.
 - b. The suspension system shall support the ceiling assembly shown on the drawings and specified herein, with a maximum deflection of 1/360 of the span, in accordance with ASTM C635.
 - c. Provide min. 12 ga. galvanized wire hangers, soft annealed steel conforming to ASTM A641, prestretched, Class 1 zinc coating, soft temper, size so that stress at 3 times hanger design load (ASTM C635, Table 1, Direct Hung) will be less than yield stress of wire.
 - d. Provide ceiling clips and inserts to receive hangers, type as recommended by suspension system manufacturer, sizes for pull-out resistance of not less than five (5) times the hanger design load, as indicated in ASTM C635.
 - e. Suspension systems shall conform to ASTM C635, intermediate duty.
 - f. Provide manufacturer's standard wall moldings with off-white baked enamel finish matching suspension systems. For circular penetrations of ceilings, provide edge moldings fabricated to diameter required to fit penetration exactly.

- 2.3 All acoustical material to conform to Federal Specifications SS-S-1188.

2.4 Noise Control

- A. Acoustical materials shall have Noise-Reduction Coefficient (NRC) in the range (.55-

.65) according to ASTM C423 Sound Absorption of Acoustical Materials in Reverberation Rooms.

- B. Ceiling Sound-Transmission Class (STC) shall be in the range (35-40) according to AMA 1-11 Ceiling Sound-Transmission Test by Two-Room Method.

PART 3 DETAIL REQUIREMENTS

- 3.1 Acoustical Contractor: All acoustical materials and suspension systems shall be installed by a subcontractor thoroughly experienced with this type of installation, and approved by the manufacturer. The acoustical contractor shall have all necessary licenses, secure all necessary permits, and pay all costs or fees for execution of his work. He shall follow the standards set forth by ASTM C636, Installation of Metal Ceiling Suspension System for Acoustical Tile and Lay-in Panels.
- 3.2 Job Conditions: Acoustical materials shall be installed under conditions as outlined in the current bulletin of the Acoustical and Insulating Materials Association.
- 3.3 Preparation of Work: Building to be examined before beginning work to determine that it is properly enclosed and the structure is in proper condition to receive acoustical materials and/or suspension system. Area shall be broom cleaned and un-interrupted for free movement of rolling scaffold. Work shall not proceed until unsatisfactory conditions have been corrected.
- 3.4 Installation of acoustical materials: The acoustical contractor shall furnish and install acoustical materials in the types, sizes, and surface design specified above.
- 3.5 Cleaning:
 - A. Following installation, clean soiled or discolored surfaces of units.
 - B. Remove and replace units that are damaged or improperly installed as directed by the Architect.
- 3.6 Subcontractor shall consult other trades and contractors involved prior to commencement of installation to determine areas of potential interference.
- 3.7 Contractor shall provide spare ceiling tile equal to 1% of each type and color of material utilized.

END OF SECTION

SECTION 09650

RESILIENT FLOORING

PART 1 - GENERAL

1.01 Section Includes:

- A. Vinyl composition tile flooring, complete with accessories.
- B. Resilient top set wall base specified in Section 09655.

1.02 Reference Standards:

- A. ADA – Americans with Disabilities Act.
- B. ASTM E648 - Test Method for Critical Radiant Flux of Floor Covering Systems Using Radiant Heat Energy Source.
- C. ASTM E662 - Smoke Obscuration NBS Smoke.
- D. ASTM F1066 - Vinyl Composition Floor Tile.
- E. FS SS-T-312B - Tile, Floor: Asphalt, Rubber, Vinyl, Vinyl Composition.

1.03 Quality Assurance:

- A. Manufacturer: Provide vinyl composition tile flooring and accessories as produced by a single manufacturer, including primers, adhesives, sealants and leveling compounds.
- B. Installer: Installer shall be certified by vinyl tile flooring manufacturer.

1.04 Submittals:

- A. Submit the following in accordance with Section 01340.
- B. Manufacturer's Product Data: Indicating all technical information, which specifies full compliance with requirements of this section, including installation instructions.
- C. Maintenance Data: Submit cleaning and maintenance data in accordance with Section 01700.
- D. Samples: 2" x 2" in size, illustrating the available colors and patterns for floor tiles, 4" long edge strips illustrating the available colors.

- 1. Include maintenance procedures, recommended maintenance materials, and suggested

schedule for cleaning.

PART 2 - PRODUCTS

2.01 Vinyl Composition Tile

- A. Type: Armstrong's "Excelon Series" vinyl composition tile composed of vinyl resins, plasticizers, stabilizers, filler and pigments, commercial quality, asbestos free, conforming to requirements of FS-SS-T-312B, Type IV, composition.
 - 1. Tile flooring shall have design/pattern and color that extend uniformly throughout the wear thickness.
 - 2. Smoke Development: 450 or less, ASTM E662.
 - 3. Critical Radiant Flux: 0.45 watts/cm² or more Class 1 ASTM E648.
 - 4. Size: 12" x 12" x 1/8" thick.
 - 5. Design/Pattern/Color: Maximum of 6 colors as selected by Architect.
- B. Type: Azrock Luxury Vinyl Tile, Stripwood, 3" wide, 36" long, enhanced woodgrain embossing.
 - 1. Design/Pattern Color: Maximum of one color to be selected by Owner.

2.02 Accessories

- A. Subfloor Filler: Ardex K-15 Self-Leveling Underlayment Concrete.
- B. Adhesives: Waterproof; types recommended by flooring manufacturer. No asbestos.

PART 3 - EXECUTION

3.01 Preparation

- A. Before installing floor tiles:
 - 1. Surfaces shall be smooth and flat with maximum variation of 1/8" in 10 ft., and ready to receive tiles.
 - 2. Concrete floors shall be dry to a maximum moisture content of 7%, and exhibit negative alkalinity, carbonization or dusting.
- B. Remove ridges and bumps from surfaces. Fill low spots, cracks, joints, holes and other defects with subfloor filler.
- C. Remove coatings from surfaces that would prevent bond, including curing compounds incompatible with adhesives, paint, oils, waxes and sealers.
- D. Vacuum or broom clean the substrate immediately before the application of flooring.

- E. Prepare and prime surfaces in accordance with adhesive manufacturer's published instructions.
- F. Beginning of installation means acceptance of substrate and site conditions.

3.02 Installation

- A. Install floor tile in accordance with latest edition of manufacturer's published instructions.
- B. Mix the tile from container to ensure shade variations are consistent.
- C. Spread only enough adhesive to permit installation of resilient tile before initial set.
- D. Set floor tiles in place & press with heavy roller to attain full adhesion.
- E. Tile Pattern:
 - 1. Lay tiles with all joints aligned to square grid pattern and pattern grain parallel with all units and parallel to length of room.
 - 2. Lay tiles to the pattern scheduled.
 - 3. Allow minimum 1/2 full size tile width at room or area perimeter.
- F. Terminate floor tiles at centerline of doors where adjacent floor finish is dissimilar.
- G. Edge Strips: Install at unprotected or exposed edges, and where flooring terminates.
- H. Scribe floor tiles to walls, columns, cabinets, floor outlets and other appurtenances to produce tight joints.
- I. Floor tiles shall be installed over covers for telephone conduits, electrical conduits and other similar items which occur within the finished floor areas.
 - 1. Tiles must be cut sharp and clean around these covers so that the covers can be removed when required.
 - 2. The tile must be applied to covers in a solid application of adhesive.

3.03 Protection and Cleaning

- A. Prohibit traffic on floor finish for 48 hours after installation.
- B. Remove excess adhesive from floor tiles and wall surfaces without damage.
- C. Clean, apply polish, and buff with type of polish, number of coats and buffing procedures in accordance with manufacturer's instructions.

- D. Perform initial maintenance according to latest edition of manufacturer's maintenance manual.
- E. Contractor to leave at job five (5) full unopened boxes of field tile color and three (3) full unopened boxes of each accent tile color.

END OF SECTION

SECTION 09655

RESILIENT BASE

PART 1 GENERAL

1.1 Section Includes

- A. Resilient wall base, complete with accessories.

1.2 Reference Standards

- A. ASTM E84 - Surface Burning Characteristics of Building Materials.
- B. FS SS-W-40 - Wall Base: Rubber.

1.3 Submittals

- A. Submit the following in accordance with Section 01340.
- B. Manufacturer's Product Data: Describing physical and performance characteristics, sizes and colors available for wall base.
- C. Samples: 2" long illustrating the available colors for wall base.

PART 2 PRODUCTS

2.1 Resilient Wall Base

- A. Type: Cove (toe) base, rubber, Fed. Spec. SS-W-40, complete with pre-molded inside corner pieces.
 - 1. Height: 4" high.
 - 2. Color: Four (4) colors as selected by Architect.
- B. Substitutions: Products of other manufacturers are acceptable ONLY after compliance with substitution requirements specified in Section 01605 and Architect's written approval.

2.2 Accessories

- A. Subfloor Filler: Type recommended by flooring material manufacturer.

- B. Primers & Adhesives: Waterproof; types recommended by flooring manufacturer.

PART 3 EXECUTION

3.1 Installation

- A. Before installing wall base, prepare surface in accordance with wall base manufacturer's published instructions.
- B. Apply wall base to walls, columns, pilasters, casework and other permanent fixtures in rooms or areas where wall base is required.
- C. Install base on solid backing. Bond tight to wall and floor surfaces.
- D. Fit joints tight and vertical. Do NOT use pieces less than 18 inches long.
- E. At Corners:
 - 1. "V" cut back of base strip to 2/3 of its thickness and fold.
 - 2. Mitered joints at outside corners are NOT acceptable.
- F. Scribe and fit to doorframes and other interruptions.

3.2 Cleaning

- A. Remove excess adhesive from floor, base and wall surfaces without damage.
- B. Clean, seal and wax base surfaces in accordance with manufacturer's instructions.

END OF SECTION

SECTION 09686

CARPET TILE

PART 1 – GENERAL

1.01 SUMMARY

- A. Section Includes
 - 1. Carpet Tile
 - 2. Installation

- B. Related Sections:
 - 1. Resilient Flooring - 09650
 - 3. Resilient Base – Section 09655

1.02 SUBMITTALS

- A. Shop Drawing showing columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required as well as direction of carpet pile and pattern, location of edge moldings and edge bindings shall be submitted to the Architect for approval prior to installation.

- B. Carpet schedule using same room designations indicated on drawings.

- C. Product Data: Provide data on specified products, describing physical and performance characteristics, sizes, patterns, colors available, and method of installation.

- D. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial color selection.

- E. Verification Samples: Submit two 18" x 18" samples illustrating color and pattern for each carpet material specified.

- F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

- G. Maintenance Data: Include maintenance procedures, recommendations for maintenance materials and equipment, and suggested schedule for cleaning.

- H. Manufacturer's Carpet Warranty.

- I. Certification of Recycled Content, Environmental Preferable Product (EPP) Certification and verification of reclamation and recycling program.

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications

1. Company specializing in manufacturing specified carpet with minimum 10 years documented experience.
2. Upon request, manufacturer to provide representative to assist in project start-up and to inspect installation while in process and upon completion. Representative will notify designated contact if any installation instructions are not followed.
3. Single Source Responsibility: Obtain each type of carpet from one source and by a single manufacturer.

B. Installer Qualifications

1. Flooring contractor must be certified by the carpet manufacturer prior to bid.
2. Flooring contractor to be a specialty contractor normally engaged in this type of work and shall have prior experience in the installation of these types of materials.
3. *Certify payment of Prevailing Wage Rates to the installers.*
4. Flooring contractor possessing Contract for the carpet installation shall not sub-contract the labor without written approval of the Project Manager.
5. Flooring contractor will be responsible for proper product installation, including floor testing and preparation as specified by the carpet manufacturer and JOB CONDITIONS herein.
6. Flooring contractor to provide Owner a written installation warranty that guarantees the completed installation to be free from defects in materials and workmanship for a period of one year after job completion.

1.04 DELIVERY, STORAGE, & HANDLING

- A. Deliver materials to the site in manufacturer's original packaging listing manufacturer's name, product name, identification number, and related information.
- B. Store in a dry location, between 60 degrees F and 80 degrees F and a relative humidity below 65%. Protect from damage and soiling. Store in pallet form as supplied by Manufacturer. Do not stack pallets.
- C. Make stored materials available for inspection by the Owner's representative.
- D. Store materials in area of installation for minimum period of 48 hours prior to installation.

1.05 PROJECT CONDITIONS

- A. Sub-floor preparation is to include all required work to prepare the existing floor for installation of the product as specified in this document and Manufacturer's installation instructions.
- B. The maximum amount of moisture evacuation from the floor is 3.0 pounds per 1,000 square feet in 24 hours. The acceptable pH level of the substrate is between 7.0 and 9.0. Flooring contractor is responsible for floor testing.
- C. All material used in sub-floor preparation and repair shall be recommended by the carpet manufacturer and shall be chemically and physically compatible with the carpet system being bid.
- D. Maintain minimum 65 degrees F ambient temperature and 65% Relative Humidity for 72 hours prior to, during, and 48 hours after installation.
- E. Do not install carpet until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient temperature and humidity conditions are and will be continuously maintained at values near those indicated for final occupancy.

1.06 EXTRA MATERIALS

- A. *Provide additional 5% of each type, color, and pattern furnished; product to be boxed and, when necessary, palletized. Coordinate storage location with owner.*
- B. *Deliver all unused carpet and large scraps to Owner for "attic stock."*

PART 2 - PRODUCTS

2.01 RECYCLED CONTENT

- A. Product must contain a minimum of 30% recycled content by weight. This percentage is calculated by dividing the weight of recycled content in one square yard of finished carpet by the total weight of one square yard of finished carpet, and multiplying by 100. [(Recycle Content Weight) / (Total Product Weight) x 100] per FTC Marketing Guides 16 C.F.R. § 260.7 (e). Additionally, product must contain a minimum of 25% recycled carpet by weight.
- B. Recycled content must be certified by a neutral, independent, third party organization such as Scientific Certification Systems. Product must carry product label certifying overall recycled content (including post-industrial and post-consumer content). Report percentage of post-industrial and post-consumer recycled content as a percentage of total product weight and the source(s) of recycled content.

- C. Product must contain 10% post-consumer recycled content by weight from recycled post consumer carpet. This ensures that carpet is diverted from landfills for the production of the product and that virgin resource use in the product is reduced.
- D. Product must be available inclusive of 100% recycled content secondary backing with no up-charge. The secondary backing must contain at least 75% recycled carpet of which a minimum of 25% shall be post consumer carpet.
 - 1. Recycled content and post consumer content must not be subject to availability. Post industrial and post consumer recycled content of product installed must be the same as those required by Project requirements.
 - 2. Also, Recycled content must be expressed as an exact percentage or a range. Statements such as “*up to 60%*” recycled content are not acceptable.
 - 3. Recycled content products provided must have equal or better performance and cost no more than comparable virgin products.
 - 4. Product’s recycled content must comply with FTC Guides 16 CFR Part 260.7 (e) in that normal by-products in product manufacturing which are normally reused within the original manufacturing process, or waste by-products that would not normally enter the waste stream do not constitute as either post consumer or post industrial recycled content.
 - 5. Manufacturer must fully comply with FTC Part 260 “Guides for the Use of Environmental Marketing Claims,” with respect to advertising, labeling, product inserts, catalogs and sales presentations of all its carpet products submitted and sold. Certification signed by an officer of the manufacturer stating the manufacturer complies with these guides maybe required for submittal upon request.

2.02 PRODUCT RECYCLABILITY

- A. Product must meet FTC guides for recyclability and must be one hundred percent (100%) closed-loop recyclable back into carpet. Products containing both recyclable and non-recyclable components, manufacturer must adequately report which portions of the product are recyclable per FTC guides 16 CFR section 260.7(d). Note: A manufacturer cannot claim that a product or any portion of a product that is incinerated is recyclable, even if incineration is used to produce heat and power (i.e. waste-to-energy) per FTC guides 16 CFR section 260.7 (d) example 3.
- B. Recyclability of product installed must be the same as those required by Project requirements.

2.03 RECYCLING PROGRAM

- A. Manufacturer must have a collection and recovery system for product and a fully established, currently operational recycling program at time of bid per FTC guides Section 260.7 (d).
 - 1. Manufacturer must have product a take back program and be able to reclaim and recycle 100% of installed product back into carpet at time of bid. Manufacturer should be able to recover and recycle similarly constructed carpet. Recycling process must be available

- for viewing. Claiming a product is recyclable based on future expectation of technology, equipment, process or availability of that product as feedstock is not acceptable.
2. Collection and recycling program must be verified by an independent, neutral third-party organization, such as Scientific Certification Systems.
 3. Manufacturer must have written guarantee that 100% of the recovered product will be recycled and that no portion of the product will be landfilled or incinerated (including waste-to-energy).

2.04 ENVIRONMENTALLY PREFERABLE PRODUCT

- A. Carpet must carry an Environmentally Preferable Product (EPP) product label and be certified as Platinum/EPP per the Sustainable Carpet Assessment Standard (SCAS) NSF-140. Product certification must be conducted by an independent, third party organization such as Scientific Certification Systems. Products carrying EPP carpet labels will be given higher preference than those carrying an EPP label for the fiber only.
- B. Carpet must carry an Environmentally Preferable Product (EPP) product label and be certified as California Platinum per the California Gold Sustainable Carpet Standard. Product certification must be conducted by an independent, third party organization such as Scientific Certification Systems.

2.05 ANTIMICROBIAL TREATMENTS

- A. Carpet must not contain any added antimicrobial treatments/pesticides. Provide documentation.

2.06 INDOOR AIR QUALITY

- A. Product must have low VOC, factory applied, “dry” adhesive.
- B. Product, inclusive of floor covering adhesive, must meet CRI’s Green Label Plus (GLP) Indoor Air Quality requirements for carpet only. Submit documentation showing CRI Green Label Plus (GLP) Certification Number for carpet (inclusive of adhesive). [If results for carpet testing are not inclusive of adhesive, submit Green Label Plus documentation for carpet and Green Label Plus documentation for adhesive].
- C. Product as installed to be securely attached to the floor in compliance with Americans with Disabilities Act (ADA), Section 4.5.3.
- D. Carpet adhesives must be below the VOC content limits specified by the South Coast Air Quality Management District Rule #1168. Provide documentation.

2.07 MANUFACTURER'S ENVIRONMENTAL COMMITMENT

- A. A manufacturer's environmental commitment will be reflected by its corporate culture and measured by the goals, policies and programs that have been instituted to improve the environmental performance of its operations. Evidence of this commitment must include:
1. All products produced by the manufacturer must meet FTC guides for recyclability and be 100% recyclable in a fully established, currently operational recycling program 16 CFR section 260.7 (d).
 2. All products produced by the manufacturer, including recycled content products, must be 100% closed-loop recyclable back into carpet.
 3. Manufacturer must show evidence of a positive and continuing improvement in source reduction and the reduction of energy, water, waste and air emissions.

2.08 CARPET WARRANTY

- A. Warranty to be sole source responsibility of the Manufacturer. Second source warranties and warranties that involve parties other than the carpet manufacturer are unacceptable.
- B. If the product fails to perform as warranted when properly installed and maintained, the affected area will be repaired or replaced at the discretion of the Manufacturer.
- C. Chair pads are not required, but are recommended for optimum textural performance. Absent the use of chair pads, more intensive maintenance will be required for areas in direct contact with chair caster traffic, and some degree of appearance change is to be expected.
- D. Warranty shall be for a specifically defined non-prorated period of fifteen years. "Lifetime" warranties are not acceptable.
- E. The non-prorated fifteen-year warranty shall specifically warrant against :
1. Excessive Surface Wear: More than 15% loss of pile fiber weight
 2. Excessive Static Electricity: More than 3.0 kV per AATCC 134
 3. Resiliency Loss of the Backing: More than 10% loss of backing resiliency
 4. Delamination
 5. Edge Ravel
 6. Zippering
- F. Tuft Bind warranty in lieu of edge ravel and zippering is not acceptable.
- G. Manufacturer to provide a written warranty that 100% of carpeting returned to manufacturer for recycling will be recycled and that no portion of the carpet will be landfilled or incinerated.

2.09 FIBER

- A. Nylon Fiber: Bulked Continuous Filament (BCF) Nylon in a loop pile construction. Cut pile is not acceptable.

- B. Fiber System: *Antron Legacy*.
- C. If fiber contains recycled content, report post consumer and post industrial recycled content of the pile face yarn based on total yarn weight i.e. [(Recycle Content in Pile Face Yarn) / (Total Weight of Pile Face Yarn) x 100]
- D. Fiber to contain carbon-core filament for permanent static control. Topical treatments are not acceptable.
- E. Durable stain inhibitor should be applied to the fiber during product manufacturing to resist fiber staining and soiling.
 - 1. Initial: Minimum 500 ppm Fluorine per CRI TM-102
 - 2. After two hot water extractions per AATCC 171: Minimum 400 ppm Fluorine per CRI TM-102

2.10 BACKING CHARACTERISTICS

- A. Primary Backing: Synthetic Non-Woven.
- B. Secondary Backing: ER3 – 100% Recycled Content with Tru-Bloc (Barrier System)
 - 1. Density (ASTM D-1667): Min. 65 lbs/cu ft +/- 5%
 - 2. Standard Size: 18” x 18”; 24” x 24”; or 36” x 36”
 - 3. Fiberglass Reinforced
 - 4. Fully fused secondary backing system that will not delaminate
 - 5. Must not contain added antimicrobial treatments
- C. Adhesive System: RS
 - 1. Low VOC, factory applied “dry” adhesive applied to backing and cured during manufacturing

2.11 PERFORMANCE CHARACTERISTICS

- A. Test reports for the following performance assurance testing to be submitted upon request. Submitted results shall represent average results for production goods of the referenced style. Requirements listed below must be met by all products.
 - 1. Flooring Radiant Panel
ASTM E-648 / NFPA 253: Class 1 (CRF: 0.45 watts/sq cm or greater)
 - 2. Federal Flammability
CPSC FF 1-70: Passes
 - 3. Smoke Density
ASTM E-662 / NFPA 258: ≤ 450 Flaming Mode

4. Electrostatic Propensity
AATCC 134 (Step & Scuff): 3.0 kV or less
5. Static Coefficient of Friction
ASTM C-1028: Passes ADA Requirements for Accessible Routes (minimum 0.60)
6. Delamination of Secondary Backing of Pile Floor Coverings
ASTM D-3936: No Delamination
7. Lightfastness
AATCC 16E: ≥ 4 @ 100 hours
8. Vetterman Drum
ASTM D-5417: Minimum 3 @ 22,000 cycles
9. Dimensional Stability
Aachen / ISO 2551: Maximum Change +/- 0.149%

2.12 MANUFACTURING SPECIFICATIONS

A. Manufactured by TANDUS Flooring

1. Monumento 03588 ER3 Modular (Color: TBD)
 - A. Construction Type: Stratatec Patterned Loop
 - B. Product Size: 24" x 24"
 - C. Face Weight: 20 oz/sq yd
 - D. Gauge: 5/64
 - E. Stitch Rate: 10 / inch
 - F. Pile Height Average: 0.187 inch
 - G. Fiber System: Antron Legacy
 - H. Dye Method: 85% Solution Dyed / 15% Yarn Dyed
 - I. Soil/Stain Protection: Ensure
 - J. Primary Tufting Substrate: Synthetic Non-Woven
 - K. Pattern Repeat: 6' W x 78.9" – *Pattern Match End Seam Only*
 - L. Total Recycled Content: 50.2% Pre-Consumer: 37.2%
 - M. Third Party Certification NSF-140: Platinum
 - N. Secondary Backing: 100% Recycled Content with Tru-Bloc (Barrier System)
 - O. Intermediate Layer: Fiberglass Reinforced Sealant
 - P. Product Construction: No Delamination per ASTM D-3936
 - Q. Secondary Backing Density: 65 lbs/cu ft
 - R. Secondary Backing Thickness: 0.087 inch
 - S. Total Weight with RS / Non-RS: 136.5 134.9 oz/sq yd +/-5%
 - T. CRI Green Label Plus Certification: GLP1366

B. Substitutes/Alternates

Subject to compliance with all requirements, “or equal” must match the selected colors, have similar aesthetic appearance and tuft density, factory-applied “dry” adhesive, equivalent EPP and recycled content certification labels and recyclability. Substitution sample and submittals must be submitted for written approval of quality and color at least ten days prior to bid to be considered. Sample of proposed substitute must be inclusive of both the face and proposed backing (color-only sample not acceptable).

2.13 ACCESSORIES

- A. Materials recommended by Manufacturer for patching, leveling, priming, etc.
- B. Subfloor Filler: Ardex K-15 Self-Leveling Underlayment Concrete.
- C. Adhesives: Products to be supplied with a low VOC, factory applied, “dry” adhesive for “peel and stick” installation.
- D. Base, Carpet Edge, and Transition Strips: As specified in applicable sections.

PART 3 EXECUTION

3.01 EXAMINATION / PREPARATION

- A. Prepare sub-floor to comply with criteria established in Manufacturer’s installation instructions. Use only preparation materials that are acceptable to the Manufacturer.
 - 1. Remove all deleterious substances from substrate(s) that would interfere with or be harmful to the installation.
 - 2. Remove sub-floor ridges and bumps. Fill cracks, joints, holes, and other defects.
- B. Verify that sub-floor is smooth and flat within specified tolerances and ready to receive carpet.
- A. Verify that substrate surface is dust-free and free of substances that would impair bonding of product to the floor.
- B. Verify that concrete surfaces are ready for installation by conducting moisture and pH testing. Results must be within limits recommended by Manufacturer.
- C. There will be no exceptions to the provisions stated in the Manufacturer’s installation instructions.

3.02 INSTALLATION - GENERAL

- A. Install product in accordance with Manufacturer’s installation instructions.

- B. Where demountable partitions or other items are indicated for installation on top of finished carpet tile floor, install carpet tile before installation of these items.
- C. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings.
- D. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- E. *Install borders parallel to walls.*
- F. Roll with appropriate roller for complete contact of carpet with mill-applied adhesive to sub-floor. Carpet to be securely adhered in accordance with ADA requirements (Section 4.5.3).
- G. Trim carpet neatly at walls and around interruptions.
- H. Completed carpet is to be smooth and free of bubbles, puckers, and other defects.

3.03 PROTECTION & CLEANING

- A. Remove excess adhesive and/or other from floor and wall surfaces without damage.
- B. All rubbish, wrappings, debris, trimmings, etc. to be removed from site and disposed of properly.
- C. Clean and vacuum carpet surfaces using a beater brush/bar commercial vacuum.
- D. After each area of carpet is installed, protect from soiling and damage by other trades.

END OF SECTION

SECTION 09910

PAINTING

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the painting and finishing as shown on the drawings and/or specified herein, including but not limited to, the following:
 1. Prime painting unprimed surfaces to be painted under this Section.
 2. Painting all items furnished with a prime coat of paint, including touching up of or repairing of abraded, damaged or rusted prime coats applied by others.
 3. Painting all ferrous metal (except stainless steel) exposed to view.
 4. Painting all galvanized ferrous metals exposed to view.
 5. Painting gypsum drywall exposed to view.
 6. Staining of wood as indicated.
 7. Painting of wood exposed to view, except items which are specified to be painted or finished under other Sections of these specifications. Back painting of all wood in contact with concrete, masonry or other moisture areas.
 8. Painting pipes, pipe coverings, conduit, ducts, insulation, hangers, supports and other mechanical and electrical items and equipment exposed to view.
 9. Painting surfaces above, behind or below grilles, gratings, diffusers, louvers, lighting fixtures, and the like, which are exposed to view through these items.
 10. Incidental painting and touching up as required to produce proper finish for painted surfaces, including touching up of factory finished items.
 11. Painting of any surface not specifically mentioned to be painted herein or on drawings, but for which painting is obviously necessary to complete the

job, or work which comes within the intent of these specifications, shall be included as though specified.

1.3 RELATED SECTIONS

- A. Shop priming is required on some, but not all of the items scheduled to be field painted, refer to other Sections of work for complete description.
- B. Shop coat on machinery and equipment: Refer to the Sections under which various items of manufactured equipment with factory applied shop prime coats are furnished, including, but not necessarily limited to, the following Sections. All items of equipment furnished with prime coat finish shall be finish painted under this Section.
 - 1. Heating, ventilation and air conditioning - Division 15.
 - 2. Plumbing - Division 15.

1.4 MATERIALS AND EQUIPMENT NOT TO BE PAINTED

- A. Items of equipment furnished with complete factory finish, except for items specified to be given a finish coat under this Section.
- B. Factory finished toilet partitions.
- C. Factory finished acoustical tile.
- D. Non-ferrous metals, except for items specified and/or indicated to be painted.
- E. Finished hardware, excepting hardware that is factory primed.
- F. Surfaces not to be painted shall be left completely free of droppings and accidentally applied materials resulting from the work of this Section.

1.5 QUALITY ASSURANCE

- A. Job Mock-Up
 - 1. In addition to the samples, specified herein to be submitted for approval, apply in the field at their final location, each type and color of approved paint materials applied 10' wide, floor to ceiling of wall surfaces, before proceeding with the remainder of the work, for approval by the Architect. Paint mock-ups to include door and frame assembly.
 - 2. These applications when approved will establish the quality and workmanship for the work of this Section.
 - 3. Repaint individual areas which are not approved, as determined by the Architect, until approval is received. Assume at least two paint mock-ups of each color and gloss for approval.

- B. Qualification of Painters: Use only qualified journeyman painters for the mixing and application of paint on exposed surfaces.
- C. Paint Coordination: Provide finish coats which are compatible with the prime paints used. Review other Sections of these specifications in which prime paints are to be provided to ensure compatibility of the total coatings system for the various substrates. Upon request from other subcontractors, furnish information on the characteristics of the finish materials proposed to be used, to ensure that compatible prime coats are used. Provide barrier coats over incompatible primers or remove and re-prime as required. Notify the Architect in writing of any anticipated problems using the coating systems as specified with substrates primed by others.
- D. All paints must conform to the Volatile Organic Compounds (VOC) standards of prevailing codes and ordinances.

1.6 SUBMITTALS

A. Materials List

1. Before any paint materials are delivered to the job site, submit to the Architect a complete list of all materials proposed to be furnished and installed under this portion of the work.
2. This shall in no way be construed as permitting substitution of materials for those specified or accepted for this work by the Architect.

B. Samples

1. Accompanying the materials list, submit to the Architect copies of the full range of colors available in each of the proposed products.
2. Upon direction of the Architect, prepare and deliver to the Architect two (2) identical sets of Samples of each of the selected colors and glosses painted onto 8-1/2" x 11" x 1/4" thick material; whenever possible, the material for Samples shall be the materials as that on which the coating will be applied in the work.

C. Manufacturer's Recommendations: In each case where material proposed is not the material specified or specifically described as an acceptable alternate in this Section of these specifications, submit for the Architect's review the current recommended method of application published by the manufacturer of the proposed material.

D. Submit data indicating that paint meets Performance Standards specified herein.

1.7 PRODUCT HANDLING

A. Deliver all paint materials to the job site in their original unopened containers with all labels intact and legible at time of use.

B. Protection

1. Store only the approved materials at the job site, and store only in a suitable and designated area restricted to the storage of paint materials and related equipment.
2. Use all means necessary to ensure the safe storage and use of paint materials and the prompt and safe disposal of waste.
3. Use all means necessary to protect paint materials before, during and after application and to protect the installed work and materials of all other trades.

C. Replacements: In the event of damage, immediately make all repairs and replacements necessary.

1.8 EXTRA STOCK

A. Upon completion of this portion of the Work, deliver to the Owner an extra stock of paint equaling approximately five (5) percent of each color and gloss used in each coating material used, with all such extra stock tightly sealed in clearly labeled containers.

1.9 JOB CONDITIONS

- A. Apply water-base paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 50 degrees F. and 90 degrees F., unless otherwise permitted by the paint manufacturer's printed instructions.
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 45 degrees F. and 95 degrees F. unless otherwise permitted by the paint manufacturer's printed instructions.
- C. Do not apply paint in snow, rain, fog or mist; or when the relative humidity exceeds eighty five (85) percent; or to damp or wet surfaces; unless otherwise permitted by the paint manufacturer's printed instructions.
- D. Painting may be continued during inclement weather only if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified by the paint manufacturer during application and drying periods.

PART 2 PRODUCTS

2.1 PAINT MANUFACTURERS

A. Provide best quality "Architectural" grade painting products for all required painting made by the following manufacturers: Benjamin Moore®, PPG®, ICI®/Glidden Pro®, Devoe®, Sherwin Williams®. Comply with number of

coats and required minimum mil thicknesses as specified herein. Equivalent paint of listed manufacturers are acceptable subject to the Architect's approval.

2.2 MATERIALS

- A. Provide undercoat paint produced by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer, and use only to recommended limits.
- B. Colors and Glosses: All colors and glosses shall be as selected by the Architect. Certain colors will require paint manufacturer to prepare special factory mixes to match colors selected by the Architect. Color schedule (with gloss) shall be furnished by the Architect.
- C. Coloring Pigment: Products of or furnished by the manufacturer of the paint or enamel approved for the work.
- D. Turpentine: Pure distilled gum spirits of turpentine, per ASTM D13.
- E. Driers, Putty, Spackling Compound, Patching Plaster, etc.: Best quality, of approved manufacture.

2.3 GENERAL STANDARDS

- A. The various surfaces shall be painted or finished as specified below in Article 2.4. However, the Architect reserves the right to change the finishes within the range of flat, semi-gloss or gloss, without additional cost to the Owner.
- B. All paints, varnishes, enamels, lacquers, stains and similar materials must be delivered in the original containers with the seals unbroken and label intact and with the manufacturer's instructions printed thereon.
- C. All painting materials shall bear identifying labels on the containers with the manufacturer's instructions printed thereon.
- D. Paint shall not be badly settled, caked or thickened in the container, shall be readily dispersed with a paddle to a smooth consistency and shall have excellent application properties.
- E. Paint shall arrive on the job color-mixed except for tinting of under-coats and possible thinning.
- F. All thinning and tinting materials shall be as recommended by the manufacturer for the particular material thinned or tinted.
- G. It shall be the responsibility of the Contractor to see that all mixed colors match the color selection made by the Architect prior to application of the coating.

2.4 SCHEDULE OF FINISHES

A. Exterior Metal

Not Required

B. Exterior (Factory Primed) Cementitious Panels

Not Required

C. Exterior (CMU) Concrete masonry units

Not Required

D. Interior Metal

Not Required

E. Interior (CMU) Concrete Masonry Units

Not Required

F. Interior Drywall

Primer: ICI®/Glidden Pro® 1030-1200 PVA Wall Water-Based Primer

Two Coats: ICI®/Glidden Pro® 1402 Acrylic Eggshell

G. Interior Painted Wood

Primer: ICI®/Glidden Pro® 1110-1200 Ultra Hide Stain Jammer

Two Coats: ICI®/Glidden Pro® 1512 Ultra Hide Alkyd Eggshell Enamel

H. Interior Natural or Stained Finished Wood

Not Required

I. Interior Plaster

Primer: ICI®/Glidden Pro® 3210-1200 Gripper Latex Primer Sealer

Two Coats: Devoe® 4216HP Acrylic Semi-Gloss Enamel

2.5 EXISTING SURFACES TO BE PAINTED

- A. Existing surfaces shall be painted in accordance with schedule given in Article 2.4 herein except that first or prime coat may be eliminated where existing paint is sound. Where existing paint must be removed down to base material, provide first or prime coat as specified.

PART 3 EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where painting and finishing are to be applied and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 GENERAL WORKMANSHIP REQUIREMENTS

- A. Only skilled mechanics shall be employed. Application may be by brush or roller. Spray application only upon acceptance from the Architect in writing.
- B. The Contractor shall furnish the Architect a schedule showing when he expects to have completed the respective coats of paint for the various areas and surfaces. This schedule shall be kept current as the job progresses.
- C. The Contractor shall protect his work at all times, and shall protect all adjacent work and materials by suitable covering or other method during progress of his work. Upon completion of the work, he shall remove all paint and varnish spots from floors, glass and other surfaces. He shall remove from the premises all rubbish and accumulated materials of whatever nature not caused by others and shall leave his part of the work in clean, orderly and acceptable condition.
- D. Remove and protect hardware, accessories, device plates, lighting fixtures, and factory finished work, and similar items, or provide ample in place protection. Upon completion of each space, carefully replace all removed items by workmen skilled in the trades involved.
- E. Remove electrical panel box covers and doors before painting walls. Paint separately and re-install after all paint is dry.
- F. All materials shall be applied under adequate illumination, evenly spread and flowed on smoothly to avoid runs, sags, holidays, brush marks, air bubbles and excessive roller stipple.
- G. Coverage and hide shall be complete. When color, stain, dirt or undercoats show through final coat of paint, the surface shall be covered by additional coats until the paint film is of uniform finish, color, appearance and coverage, at no additional cost to the Owner.

- H. All coats shall be dry to manufacturer's recommendations before applying succeeding coats.
- I. Do not apply paint behind frameless mirrors that use mastic for adhering to wall surface.

3.3 PREPARATION OF SURFACES

A. Existing Surfaces: Clean existing surfaces requiring paint or finishing, remove all loose and flaking paint or finish and sand surface smooth as required to receive new paint or finish. No "telegraphing" of lines, ridges, flakes, etc., through new surfacing is permitted. Where this occurs, Contractor shall be required to sand smooth and re-finish until surface meets with Architect's approval.

B. General

1. The Contractor shall be held wholly responsible for the finished appearance and satisfactory completion of painting work. Properly prepare all surfaces to receive paint, which includes cleaning, sanding, and touching-up of all prime coats applied under other Sections of the work. Broom clean all spaces before painting is started. All surfaces to be painted or finished shall be perfectly dry, clean and smooth.
2. Perform all preparation and cleaning procedures in strict accordance with the paint manufacturer's instructions and as herein specified, for each particular substrate condition.
3. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease with clean cloths and cleaning solvents prior to mechanical cleaning. Program the cleaning and painting so that dust and other contaminants from the cleaning process will not fall in wet, newly painted surfaces.

C. Metal Surfaces

1. Weld Fluxes: Remove weld fluxes, splatters, and alkali contaminants from metal surfaces in an approved manner and leave surface ready to receive painting.
2. Bare Metal: Thoroughly clean off all foreign matter such as grease, rust, scale and dirt before priming coat is applied. Clean surfaces, where solder flux has been used, with benzene. Clean surfaces by flushing with mineral spirits. For aluminum surfaces, wipe down with an oil free solvent prior to application of any pre-treatment.
3. Shop Primed Metal: Clean off foreign matter as specified for "Bare Metal". Prime bare, rusted, abraded and marred surfaces with approved primer after proper cleaning of surfaces. Sandpaper all rough surfaces smooth.

4. Galvanized Metal: Prepare surface as per the requirements of ASTM D-6386.
 5. Metal Filler: Fill dents, cracks, hollow places, open joints and other irregularities in metal work to be painted with an approved metal filler suitable for the purpose and meeting the requirements of the related Section of work; after setting, sand to a smooth, hard finish, flush with adjoining surface.
- D. Gypsum Drywall Surfaces: Scrape off all projections and splatters, spackles all holes or depressions, including taped and spackled joints, sand smooth. Conform to standards established in Section 09260 Gypsum Drywall.
 - E. Wood Surfaces: Sand to remove all roughness, loose edges, splinters and then brush to remove dust. Wash off grease or dirt with an approved cleaner. Fill all cracks, splits, nail holes, screw holes, and surface defects with putty after the priming coat has been applied. Putty shall be brought up flush with the surface and sanded smooth and touched-up with primer when dry.
 - F. Testing for Moisture Content: Contractor shall test all plaster and drywall surfaces for moisture content using a reliable electronic moisture meter. Contractor shall also test latex type fillers for moisture content before application of top coats of paint. Do not apply any paint or sealer to any surface or to latex type filler where the moisture content exceeds seven (7) percent as measured by the electronic moisture meter.
 - G. Touch-Up: Prime paint all patched portions in addition to all other specified coats.

3.4 MATERIALS PREPARATION

- A. Mix and prepare painting materials in strict accordance with the manufacturer's directions.
- B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing, and application of paint in a clean condition, free of foreign materials and residue.
- C. Stir all materials before application to produce a mixture of uniform density, and as required during the application of the materials. Do not stir any film which may form on the surface into the material. Remove the film and, if necessary, strain the material before using.
- D. Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are to be applied. Tint undercoats to match the color of the finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

3.5 APPLICATION

A. General

1. Apply paint by brush or roller in accordance with the manufacturer's directions. Use brushes best suited for the type of material being applied. Use rollers of carpet, velvet back, or high pile sheep's wool as recommended by the paint manufacturer for material and texture required.
2. The number of coats and paint film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has completely dried. Sand between each enamel or varnish coat application with fine sandpaper, or rub surfaces with pumice stone where required to produce an even, smooth surface in accordance with the coating manufacturer's directions.
3. Apply additional coats when undercoats, stains, or other conditions show through the final coat of paint, until the paint film is of uniform finish, color and appearance. Give special attention to insure that all surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a film thickness equivalent to that of flat surfaces.
4. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - a. "Exposed surfaces" is defined as those areas visible when permanent or built-in fixtures, convector covers, covers for finned tube radiation, grilles, etc., are in place in areas scheduled to be painted.
5. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint, before final installation of equipment.
6. Paint the back sides of access panels, removable or hinged covers to match the exposed surfaces.
7. Finish doors on tops, bottoms, and side edges the same as the faces, unless otherwise indicated.
8. Enamel finish applied to wood or metal shall be sanded with fine sandpaper and then cleaned between coats to produce an even surface.
9. Paste wood filler applied on open grained wood after beginning to flatten, shall be wiped across the grain of the wood, then with a circular motion, to secure a smooth, filled, clean surface with filler remaining in open grain only. After overnight dry, sand surface with the grain until smooth before applying specified coat.

B. Scheduling Painting

1. Apply the first coat material to surfaces that have been cleaned, pre-treated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
 2. Allow sufficient time between successive coatings to permit proper drying. Do not re-coat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- C. Prime Coats: Re-coat primed and sealed walls and ceilings where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.
- D. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage.
- E. “Touching-Up” of Factory Finishes: Unless otherwise specified or shown, materials with a factory finish shall not be painted at the project site. To “touch-up”, the Contractor shall use the factory finished material manufacturer’s recommended paint materials to repair abraded, chipped, or otherwise defective surfaces.

3.6 PROTECTION

- A. Protect work of other trades, whether to be painted or not, against damage by the painting and finishing work. Leave all such work undamaged. Correct any damages by cleaning, repairing or replacing, and repainting, as acceptable to the Architect.
- B. Provide “Wet Paint” signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.

3.7 CLEAN UP

- A. During the progress of the work, remove from the site all discarded paint materials, rubbish, cans and rags at the end of each work day.
- B. Upon completion of painting work, clean window glass and other paint spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- C. At the completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

END OF SECTION

SECTION 10400

SIGNAGE

PART 1 GENERAL

A. Applicable Publications

1. American Society for Testing and Materials (ASTM):

B26 Aluminum-alloy Sand Castings

B62 Composition Bronze or Ounce Metal Castings

B108 Aluminum-alloy Permanent Mold Castings

B209 Aluminum and Aluminum-alloy Sheet and Plate

B221 Aluminum and Aluminum-alloy Extruded Bars, Rods, Wire, Shapes, and Tubes

2. Submittals: Submit the following as specified in Section 01340 "Submittals":

a. Shop Drawings:

Interior signage schedule.

b. Manufacturer's Data:

Interior signage.

PART 2 PRODUCTS

A. Interior Plaqué Signage:

1. Plastic Laminate: 3/16" thick plastic laminate (6" x 8" wide) with 1/32" raised letters.
2. Sub-surface background with Front Surface Raised Letters: Minimum 1/8" thick clear matte acrylic sub-surface screen printed with background color with 1/16" thick acrylic before being laminated to a minimum of 1/8" thick black opaque acrylic base plate. Provide radius corners. All lettering and colors shall meet ADA requirements. Lettering style shall be 5/8" high Standard Bold Condensed.

- a. Sign Locations and Copy
 - (9) OFFICE
 - (1) WOMEN
 - (1) MEN
 - (2) MECHANICAL
 - (1) VAULT
 - (1) FILE ROOM
 - (1) STORAGE

- b. Each sign shall also have the same message in Grade 2 Braille to ADA standards.

3. Mountings:

- a. Shim Plate: 0.090" aluminum shim plate with pre-drilled countersunk holes for screw application to mounting surface. Provide mounting screws.
- b. Mechanical Fasteners: Provide countersunk mounting holes in plaques and sufficient mounting screws.
- c. Mounting Location and Height: Signs shall be installed on the wall adjacent to the latch side of the door. Where there is no wall space to the latch side of the door, including at double leaf doors, signs shall be placed on the nearest adjacent wall. Mounting height shall be 60" above the finish floor to the centerline of the sign. Mounting location for such signage shall be so that a person may approach within 3" of signage without encountering protruding object or standing within the swing of a door.

PART 3 EXECUTION

A. Inspection of Surfaces:

- 1. Examine locations and condition of surfaces on which signage will be installed and verify that there are no defects or errors that would prevent the proper execution of this work or endanger its permanency.
- 2. Installation:
 - a. Install signage plumb and true. Provide anchorage for fastening signs securely in place. Anchorage shall include slotted inserts, expansion shields, and powder-driven fasteners for concrete; toggle bolts and thru-bolts for masonry; machine and carriage bolts for steel; thru-bolts, lag bolts, and screws for wood. Provide slotted inserts of types required to engage with the

- anchors.
3. Dissimilar Materials:
 - a. Where dissimilar metals are in contact, or where aluminum is in contact with concrete, mortar, masonry, wet or pressure-treated wood, or absorbent materials subject to wetting, coat the surfaces with bituminous paint, asphalt varnish, or metal primer.
 4. Protection:
 - a. Protect installed work from damage.
 5. Cleaning:
 - a. Repair damage to signs incurred during installation. Replace signs that cannot be repaired to new condition. Clean glass, frames, and other sign surfaces.

END OF SECTION

SECTION 10520

FIRE PROTECTION SPECIALTIES

PART 1 SCOPE

- 1.1 Furnish and install all fire extinguisher equipment as shown and specified. Provide all labor, equipment, materials, operations and incidentals necessary and required to complete the work.

PART 2 MATERIALS

- 2.1 Fire Extinguisher – J.L. Industries, Cosmic 10E, Multi-Purpose Dry Chemical with a UL Rating 4A-60B:C. **Two (2)** extinguishers required.
- 2.2 Fire Extinguisher Cabinets – J.L. Industries, Ambassador Series, Model 1015F10 recessed (paint finish to be selected by architect). **Two (2)** cabinets required.
- 2.3 Door & trim to be fabricated from cold-rolled steel (paint finish to be selected by architect).

PART 3 DETAIL REQUIREMENTS

- 3.1 Locate fire extinguishers and cabinets where noted on plans or indicated by Architect.
- 3.2 Install fire extinguisher cabinets per manufacturer's instructions.

END OF SECTION

SECTION 10800

TOILET ACCESSORIES

PART 1 - SCOPE:

- 1.1 Furnish and install all building specialties shown and/or specified. Provide all labor, equipment, materials operations and incidentals necessary and required to complete the work.

PART 2 - MATERIALS:

- 2.1 Public Toilet Accessories: (also review interior elevations for additional accessory requirements).
 1. Grab Bars - Bradley #8120-00142, 42" long & #8120-00136, 36" long, satin finish stainless steel with safety grip, 1-1/2" clearance, 1-1/2" diameter pipe, concealed mounting kits for each bar. See architectural plans for locations.
 2. Mirror with Stainless Steel Frame - Bradley #781-1836 (18"x36") or approved equal. See architectural plans for locations.

END OF SECTION

SECTION 15050

BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all Work herein.
- B. The Contract Drawings indicate the extent and general arrangement of the systems. If any departure from the Contract Drawings are deemed necessary by the Contractor, details of such departures and the reasons therefore, shall be submitted to the Architect for approval as soon as practicable. No such departures shall be made without the prior written approval of the Architect.
- C. Notwithstanding any reference in the Specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalog number, such reference shall not be construed as limiting competition; and the Contractor, in such cases, may at his option use any article, device, product, material, fixture, form or type of construction which in the judgment of the Architect, expressed in writing, is equal to that specified.

1.02 SCOPE OF WORK

- A. The Work included under this Contract consists of the furnishing and installation of all equipment and material necessary and required to form the complete and functioning systems in all of its various phases, all as shown on the accompanying Drawings and/or described in these Specifications. The contractor shall review all pertinent drawings, including those of other contracts prior to commencement of Work.
- B. This Division requires the furnishing and installing of all items Specified herein, indicated on the Drawings or reasonably inferred as necessary for safe and proper operation; including every article, device or accessory (whether or not specifically called for by item) reasonably necessary to facilitate each system's functioning as indicated by the design and the equipment specified. Elements of the work include, but are not limited to, materials, labor, supervision, transportation, storage, equipment, utilities, all required permits, licenses and inspections. All work performed under this Section shall be in accordance with the Project Manual, Drawings and Specifications and is subject to the terms and conditions of the Contract.

- C. The approximate locations of Mechanical (HVAC) and Plumbing items are indicated on the Drawings. These Drawings are not intended to give complete and accurate details in regard to location of outlets, apparatus, etc. Exact locations are to be determined by actual measurements at the building, and will in all cases be subject to the Review of the Owner or Engineer, who reserves the right to make any reasonable changes in the locations indicated without additional cost to the Owner.
- D. Items specifically mentioned in the Specifications but not shown on the Drawings and/or items shown on Drawings but not specifically mentioned in the Specifications shall be installed by the Contractor under the appropriate section of work as if they were both specified and shown.
- E. All discrepancies between the Contract Documents and actual job-site conditions shall be reported to the Owner or Engineer so that they will be resolved prior to the bidding, where this cannot be done at least 7 working days prior to bid; the greater or more costly of the discrepancy shall be bid. All labor and materials required to perform the work described shall be included as part of this Contract.
- F. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and fully operating system in cooperation with other trades.
- G. It is the intent of the above "Scope" to give the Contractor a general outline of the extent of the Work involved; however, it is not intended to include each and every item required for the Work. Anything omitted from the "Scope" but shown on the Drawings, or specified later, or necessary for a complete and functioning heating, ventilating and air conditioning system shall be considered a part of the overall "Scope".
- H. The Contractor shall rough-in fixtures and equipment furnished by others from rough-in and placement drawings furnished by others. The Contractor shall make final connection to fixtures and equipment furnished by others.
- I. The Contractor shall participate in the commissioning process as required. Including, but not limited to meeting attendance, completion of checklists and participation in functional testing.

1.03 SCHEMATIC NATURE OF CONTRACT DOCUMENTS

- A. The contract documents are schematic in nature in that they are only to establish scope and a minimum level of quality. They are not to be used as actual working construction drawings. The actual working construction drawings shall be the approved shop drawings.
- B. All duct or pipe or equipment locations as indicated on the documents do not indicate

every transition, offset, or exact location. All transitions, offsets clearances and exact locations shall be established by actual field measurements, coordination with the structural, architectural and reflected ceiling plans, and other trades. Submit shop drawings for approval.

- C. All transitions, offsets and relocations as required by actual field conditions shall be performed by the contractor at no additional cost to the owner.
- D. Additional coordination with electrical contractor may be required to allow adequate clearances of electrical equipment, fixtures and associated appurtenances. Contractor to notify Architect and Engineer of unresolved clearances, conflicts or equipment locations.

1.04 SITE VISIT AND FAMILIARIZATION

- A. Before submitting a bid, it will be necessary for each Contractor whose work is involved to visit the site and ascertain for himself the conditions to be met therein in installing his work and make due provision for same in his bid. It will be assumed that this Contractor in submitting his bid has visited the premises and that his bid covers all work necessary to properly install the equipment shown. Failure on the part of the Contractor to comply with this requirement shall not be considered justification for the omission or faulty installation of any work covered by these Specifications and Drawings.
- B. Understand the existing utilities from which services will be supplied; verify locations of utility services, and determine requirements for connections.
- C. Determine in advance that equipment and materials proposed for installation fit into the confines indicated.

1.05 WORK SPECIFIED IN OTHER SECTIONS

- A. Finish painting is specified. Prime and protective painting are included in the work of this Division.
- B. Owner and General Contractor furnished equipment shall be properly connected to Mechanical (HVAC) and Plumbing systems.
- C. Furnishing and installing all required Mechanical (HVAC) and Plumbing equipment control relays and electrical interlock devices, conduit, wire and J-boxes are included in the Work of this Division.

1.06 PERMITS, TESTS, INSPECTIONS

- A. Arrange and pay for all permits, fees, tests, and all inspections as required by

governmental authorities.

1.07 DATE OF FINAL ACCEPTANCE

- A. The date of final acceptance shall be the date of owner occupancy, or the date all punch list items have been completed or final payment has been received. Refer to Division One for additional requirements.
- B. The date of final acceptance shall be documented in writing and signed by the architect, owner and contractor.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.
- B. Deliver products to the project at such time as the project is ready to receive the equipment, pipe or duct properly protected from incidental damage and weather damage.
- C. Damaged equipment, duct or pipe shall be promptly removed from the site and new, undamaged equipment, pipe and duct shall be installed in its place promptly with no additional charge to the Owner.

1.09 NOISE AND VIBRATION

- A. The heating, ventilating and air conditioning systems, and the component parts thereof, shall be guaranteed to operate without objectionable noise and vibration.
- B. Provide foundations, supports and isolators as specified or indicated, properly adjusted to prevent transmission of vibration to the Building structure, piping and other items.
- C. Carefully fabricate ductwork and fittings with smooth interior finish to prevent turbulence and generation or regeneration of noise.
- D. All equipment shall be selected to operate with minimum of noise and vibration. If, in the opinion of the Architect, objectionable noise or vibration is produced or transmitted to or through the building structure by equipment, piping, ducts or other parts of the Work, the Contractor shall rectify such conditions without extra cost to the Owner.

1.10 APPLICABLE CODES

- A. Obtain all required permits and inspections for all work required by the Contract Documents and pay all required fees in connection thereof.
- B. Arrange with the serving utility companies for the connection of all required utilities and pay all charges, meter charges, connection fees and inspection fees, if required.
- C. Comply with all applicable codes, specifications, local ordinances, industry standards, utility company regulations and the applicable requirements which includes and is not limited to the following nationally accepted codes and standards:
 - 1. Air Moving & Conditioning Association, AMCA.
 - 2. American Standards Association, ASA.
 - 3. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., ASHRAE.
 - 4. American Society of Mechanical Engineers, ASME.
 - 5. American Society of Plumbing Engineers, ASPE.
 - 6. American Society of Testing Materials, ASTM.
 - 7. American Water Works Association, AWWA.
 - 8. National Bureau of Standards, NBS.
 - 9. National Fire Protection Association, NFPA.
 - 10. Sheet Metal & Air Conditioning Contractors' National Association, SMACNA.
 - 11. Underwriters' Laboratories, Inc., UL.
 - 12. International Energy Conservation Code, IECC.
 - 13. International Fire Code.
 - 14. International Gas Code.
- D. Where differences existing between the Contract Documents and applicable state or city building codes, state and local ordinances, industry standards, utility company regulations and the applicable requirements of the listed nationally accepted codes and standards, the more stringent or costly application shall govern. Promptly notify the Engineer in writing of all differences.
- E. When directed in writing by the Engineer, remove all work installed that does not comply with the Contract Documents and applicable state or city building codes, state and local ordinances, industry standards, utility company regulations and the applicable requirements of the above listed nationally accepted codes and standards, correct the deficiencies, and complete the work at no additional cost to the Owner.

1.11 DEFINITIONS AND SYMBOLS

- A. General Explanation: A substantial amount of construction and Specification language constitutes definitions for terms found in other Contract Documents, including Drawings which must be recognized as diagrammatic and schematic in nature and not completely descriptive of requirements indicated thereon. Certain

terms used in Contract Documents are defined generally in this article, unless defined otherwise in Division 1.

- B. Definitions and explanations of this Section are not necessarily either complete or exclusive, but are general for work to the extent not stated more explicitly in another provision of the Contract Documents.
- C. Indicated: The term "Indicated" is a cross-reference to details, notes or schedules on the Drawings, to other paragraphs or schedules in the Specifications and to similar means of recording requirements in Contract Documents. Where such terms as "Shown", "Noted", "Scheduled", "Specified" and "Detailed" are used in lieu of "Indicated", it is for the purpose of helping the reader locate cross-reference material, and no limitation of location is intended except as specifically shown.
- D. Directed: Where not otherwise explained, terms such as "Directed", "Requested", "Accepted", and "Permitted" mean by the Architect or Engineer. However, no such implied meaning will be interpreted to extend the Architect's or Engineer's responsibility into the Contractor's area of construction supervision.
- E. Reviewed: Where used in conjunction with the Engineer's response to submittals, requests for information, applications, inquiries, reports and claims by the Contractor the meaning of the term "Reviewed" will be held to limitations of Architect's and Engineer's responsibilities and duties as specified in the General and Supplemental Conditions. In no case will "Reviewed" by Engineer be interpreted as a release of the Contractor from responsibility to fulfill the terms and requirements of the Contract Documents.
- F. Furnish: Except as otherwise defined in greater detail, the term "Furnish" is used to mean supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
- G. Install: Except as otherwise defined in greater detail, the term "Install" is used to describe operations at the project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance.
- H. Provide: Except as otherwise defined in greater detail, the term "Provide" is used to mean "Furnish and Install", complete and ready for intended use, as applicable in each instance.
- I. Installer: Entity (person or firm) engaged by the Contractor or its subcontractor or Sub-contractor for performance of a particular unit of work at the project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations,

as applicable in each instance. It is a general requirement that such entities (Installers) be expert in the operations they are engaged to perform.

- J. Imperative Language: Used generally in Specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by the Contractor. For clarity of reading at certain locations, contrasting subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or when so noted by other identified installers or entities.
- K. Minimum Quality/Quantity: In every instance, the quality level or quantity shown or specified is intended as minimum quality level or quantity of work to be performed or provided. Except as otherwise specifically indicated, the actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable tolerance limits. In complying with requirements, indicated or scheduled numeric values are either minimums or maximums as noted or as appropriate for the context of the requirements. Refer instances of uncertainty to Owner or Engineer via a request for information (RFI) for decision before proceeding.
- L. Abbreviations and Symbols: The language of Specifications and other Contract Documents including Drawings is of an abbreviated type in certain instances, and implies words and meanings which will be appropriately interpreted. Actual word abbreviations of a self explanatory nature have been included in text of Specifications and Drawings. Specific abbreviations and symbols have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of Specification requirements with notations on Drawings and in Schedules. These are frequently defined in Section at first instance of use or on a Legend and Symbol Drawing. Trade and industry association names and titles of generally recognized industry standards are frequently abbreviated. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of Contract Documents so indicate. Except as otherwise indicated, graphic symbols and abbreviations used on Drawings and in Specifications are those recognized in construction industry for indicated purposes. Where not otherwise noted symbols and abbreviations are defined by 1993 ASHRAE Fundamentals Handbook, chapter 34 "Abbreviations and Symbols", ASME and ASPE published standards.

1.12 DRAWINGS AND SPECIFICATIONS

- A. These Specifications are intended to supplement the Drawings and it will not be the province of the Specifications to mention any part of the work which the Drawings are competent to fully explain in every particular and such omission is not to relieve the Contractor from carrying out portions indicated on the Drawings only.

- B. Should items be required by these Specifications and not indicated on the Drawings, they are to be supplied even if of such nature that they could have been indicated thereon. In case of disagreement between Drawings and Specifications, or within either Drawings or Specifications, the better quality or greater quantity of work shall be estimated and the matter referred to the Architect or Engineer for review with a request for information and clarification at least 7 working days prior to bid opening date for issuance of an addendum.
- C. The listing of product manufacturers, materials and methods in the various sections of the Specifications, and indicated on the Drawings, is intended to establish a standard of quality only. It is not the intention of the Owner or Engineer to discriminate against any product, material or method that is equal to the standards as indicated and/or specified, nor is it intended to preclude open, competitive bidding. The fact that a specific manufacturer is listed as an acceptable manufacturer should not be interpreted to mean that the manufacturers' standard product will meet the requirements of the project design, Drawings, Specifications and space constraints.
- D. The Architect or Engineer and Owner shall be the sole judge of quality and equivalence of equipment, materials and methods.
- E. Products by other reliable manufacturers, other materials, and other methods, will be accepted as outlined, provided they have equal capacity, construction, and performance. However, under no circumstances shall any substitution be made without the written permission of the Architect or Engineer and Owner. Request for prior approval must be made in writing 10 days prior to the bid date without fail.
- F. Wherever a definite product, material or method is specified and there is not a statement that another product, material or method will be acceptable, it is the intention of the Owner or Engineer that the specified product, material or method is the only one that shall be used without prior approval.
- G. Wherever a definite material or manufacturer's product is specified and the Specification states that products of similar design and equal construction from the specified list of manufacturers may be substituted, it is the intention of the Owner or Engineer that products of manufacturers that are specified are the only products that will be acceptable and that products of other manufacturers will not be considered for substitution without approval.
- H. Wherever a definite product, material or method is specified and there is a statement that "OR EQUAL" product, material or method will be acceptable, it is the intention of the Owner or Engineer that the specified product, material or method or an "OR EQUAL" product, material or method may be used if it complies with the specifications and is submitted for review to the Engineer as outline herein.

- I. Where permission to use substituted or alternative equipment on the project is granted by the Owner or Engineer in writing, it shall be the responsibility of the Contractor or Subcontractor involved to verify that the equipment will fit in the space available which includes allowances for all required Code and maintenance clearances, and to coordinate all equipment structural support, plumbing and electrical requirements and provisions with the Mechanical (HVAC) and Plumbing Design Documents and all other trades, including Division 16.
- J. Changes in architectural, structural, electrical, mechanical, and plumbing requirements for the substitution shall be the responsibility of the bidder wishing to make the substitution. This shall include the cost of redesign by the affected designer(s). Any additional cost incurred by affected subcontractors shall be the responsibility of this bidder and not the owner.
- K. If any request for a substitution of product, material or method is rejected, the Contractor will automatically be required to furnish the product, material or method named in the Specifications. Repetitive requests for substitutions will not be considered.
- L. The Owner or Engineer will investigate all requests for substitutions when submitted in accordance with above and if accepted, will issue a letter allowing the substitutions.
- M. Where equipment other than that used in the design as specified or shown on the Drawings is substituted (either from an approved manufacturers list or by submittal review), it shall be the responsibility of the substituting Contractor to coordinate space requirements, building provisions and connection requirements with his trades and all other trades and pay all additional costs to other trades, the Owner, the Architect or Engineer, if any, due to the substitutions.

1.13 SUBMITTALS

- A. Coordinate with Division 1 for submittal timetable requirements, unless noted otherwise within thirty (30) days after the Contract is awarded the Contractor shall submit a minimum of eight (8) complete bound sets of shop drawings and complete data covering each item of equipment or material. The first submittal of each item requiring a submittal must be received by the Architect or Engineer within the above thirty day period. The Architect or Engineer shall not be responsible for any delays or costs incurred due to excessive shop drawing review time for submittals received after the thirty (30) day time limit. The Architect and Engineer will retain one (1) copy each of all shop drawings for their files. Where full size drawings are involved, submit one (1) print and one (1) reproducible sepia or mylar in lieu of eight (8) sets. All literature pertaining to an item subject to Shop Drawing submittal shall be submitted at one time. A submittal shall not contain information from more than one Specification section, but may have a section subdivided into items or equipment as

listed in each section. The Contractor may elect to submit each item or type of equipment separately. Each submittal shall include the following items enclosed in a suitable binder:

1. A cover sheet with the names and addresses of the Project, Architect, MEP Engineer, General Contractor and the Subcontractor making the submittal. The cover sheet shall also contain the section number covering the item or items submitted and the item nomenclature or description.
 2. An index page with a listing of all data included in the Submittal.
 3. A list of variations page with a listing all variations, including unfurnished or additional required accessories, items or other features, between the submitted equipment and the specified equipment. If there are no variations, then this page shall state "NO VARIATIONS". Where variations affect the work of other Contractors, then the Contractor shall certify on this page that these variations have been fully coordinated with the affected Contractors and that all expenses associated with the variations will be paid by the submitting Contractor. This page will be signed by the submitting Contractor.
 4. Equipment information including manufacturer's name and designation, size, performance and capacity data as applicable. All applicable Listings, Labels, Approvals and Standards shall be clearly indicated.
 5. Dimensional data and scaled drawings as applicable to show that the submitted equipment will fit the space available with all required Code and maintenance clearances clearly indicated and labeled at a minimum scale of $1/4" = 1'-0"$, as required to demonstrate that the alternate or substituted product will fit in the space available.
 6. Identification of each item of material or equipment matching that indicated on the Drawings.
 7. Sufficient pictorial, descriptive and diagrammatic data on each item to show its conformance with the Drawings and Specifications. Any options or special requirements or accessories shall be so indicated. All applicable information shall be clearly indicated with arrows or another approved method.
 8. Additional information as required in other Sections of this Division.
 9. Certification by the General Contractor and Subcontractor that the material submitted is in accordance with the Drawings and Specifications, signed and dated in long hand. Submittals that do not comply with the above requirements shall be returned to the Contractor and shall be marked "REVISE AND RESUBMIT".
- B. Refer to Division 1 for additional information on shop drawings and submittals.
- C. Equipment and materials submittals and shop drawings will be reviewed for compliance with design concept only. It will be assumed that the submitting Contractor has verified that all items submitted can be installed in the space allotted.

Review of shop drawings and submittals shall not be considered as a verification or guarantee of measurements or building conditions.

- D. Where shop drawings and submittals are marked "REVIEWED", the review of the submittal does not indicate that submittals have been checked in detail nor does it in any way relieve the Contractor from his responsibility to furnish material and perform work as required by the Contract Documents.
- E. Shop drawings shall be reviewed and returned to the Contractor with one of the following categories indicated:
1. REVIEWED: Contractor need take no further submittal action, shall include this submittal in the O&M manual and may order the equipment submitted on.
 2. REVIEWED AS NOTED: Contractor shall submit a letter verifying that required exceptions to the submittal have been received and complied with including additional accessories or coordination action as noted, and shall include this submittal and compliance letter in the O&M manual. The contractor may order the equipment submitted on at the time of the returned submittal providing the Contractor complies with the exceptions noted.
 3. NOT APPROVED: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is not approved, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or drawings. Contractor shall not order equipment that is not approved. Repetitive requests for substitutions will not be considered.
 4. REVISE AND RESUBMIT: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked revise and resubmit, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or provide as noted on previous shop drawings. Contractor shall not order equipment marked revise and resubmit. Repetitive requests for substitutions will not be considered.
 5. CONTRACTOR'S CERTIFICATION REQUIRED: Contractor shall resubmit submittal on material, equipment or method of installation. The Contractor's stamp is required stating the submittal meets all conditions of the contract documents. The stamp shall be signed by the General Contractor. The submittal will not be reviewed if the stamp is not placed and signed on all shop drawings.
 6. MANUFACTURER NOT AS SPECIFIED: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked manufacturer not as specified, the Contractor will automatically be required to furnish the product, material or method named in the specifications. Contractor shall not order equipment where submittal is

marked manufacturer not as specified. Repetitive requests for substitutions will not be considered.

- F. Materials and equipment which are purchased or installed without shop drawing review shall be at the risk of the Contractor and the cost for removal and replacement of such materials and equipment and related work which is judged unsatisfactory by the Owner or Engineer for any reason shall be at the expense of the Contractor. The responsible Contractor shall remove the material and equipment noted above and replace with specified equipment or material at his own expense when directed in writing by the Architect or Engineer.
- G. Shop Drawing Submittals shall be complete and checked prior to submission to the Engineer for review.
- H. Submittals are required for, but not limited to, the following items:
 - 1. Pipe Material and Specialties.
 - 2. Pipe Fabrication Drawings.
 - 3. Basic Materials.
 - 4. Duct Insulation.
 - 5. Duct Specialties.
 - 6. Duct Fabrication Drawings.
 - 7. Air Distribution Devices.
 - 8. Filters.
 - 9. Fire Dampers and Fire Smoke Dampers.
 - 10. Test, Adjust and Balance Reports.
 - 11. Testing, Adjusting and Balancing Contractor Qualifications.
 - 12. Coordination Drawings.
- I. Refer to other Division 15 sections for additional shop drawing requirements. Provide samples of actual materials and/or equipment to be used on the Project upon request of the Owner or Engineer.

1.14 COORDINATION DRAWINGS

- A. Prepare coordination drawings to a scale of 1/4"=1'-0" or larger; detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:
 - 1. Indicate the proposed locations of pipe, duct, equipment, and other materials. Include the following:
 - a. Wall and type locations.

- b. Clearances for installing and maintaining insulation.
 - c. Locations of light fixtures and sprinkler heads.
 - d. Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.
 - e. Equipment connections and support details.
 - f. Exterior wall and foundation penetrations.
 - g. Routing of storm and sanitary sewer piping.
 - h. Fire-rated wall and floor penetrations.
 - i. Sizes and location of required concrete pads and bases.
 - j. Valve stem movement.
 - k. Structural floor, wall and roof opening sizes and details.
- 2. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
 - 3. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
 - 4. Prepare reflected ceiling plans to coordinate and integrate installations, air distribution devices, light fixtures, communication systems components, and other ceiling-mounted items.
- B. This Contractor shall be responsible for coordination of all items that will affect the installation of the work of this Division. This coordination shall include, but not be limited to: voltage, ampacity, capacity, electrical and piping connections, space requirements, sequence of construction, building requirements and special conditions.
 - C. By submitting shop drawings on the project, this Contractor is indicating that all necessary coordination has been completed and that the systems, products and equipment submitted can be installed in the building and will operate as specified and intended, in full coordination with all other Contractors and Subcontractors.

1.15 RECORD DOCUMENTS

- A. Prepare record documents in accordance with the requirements in Special Project Requirements, in addition to the requirements specified in Division 15, indicate the following installed conditions:
 - 1. Duct mains and branches, size and location, for both exterior and interior; locations of dampers, fire dampers, duct access panels, and other control devices; filters, fuel fired heaters, fan coils, condensing units, and roof-top A/C units requiring periodic maintenance or repair.
 - 2. Mains and branches of piping systems, with valves and control devices located and numbered, concealed unions located, and with items requiring maintenance located (i.e., traps, strainers, expansion compensators, tanks,

- etc.). Valve location diagrams, complete with valve tag chart. Indicate actual inverts and horizontal locations of underground piping.
3. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
 4. Approved substitutions, Contract Modifications, and actual equipment and materials installed.
 5. Contract Modifications, actual equipment and materials installed.
- B. Engage the services of a Land Surveyor or Professional Engineer registered in the state in which the project is located as specified herein to record the locations and invert elevations of underground installations.
- C. The Contractor shall maintain a set of clearly marked black line record "AS-BUILT" prints on the job site on which he shall mark all work details, alterations to meet site conditions and changes made by "Change Order" notices. These shall be kept available for inspection by the Owner, Architect or Engineer at all times.
- D. Refer to Division 1 for additional requirements concerning record drawings. If the Contractor does not keep an accurate set of as-built drawings, the pay request may be altered or delayed at the request of the Architect. Mark the drawings with a colored pencil. Delivery of as-built prints and reproducibles is a condition of final acceptance.
- E. The record prints shall be updated on a daily basis and shall indicate accurate dimensions for all buried or concealed work, precise locations of all concealed pipe or duct, locations of all concealed valves, controls and devices and any deviations from the work shown on the Construction Documents which are required for coordination. All dimensions shall include at least two dimensions to permanent structure points.
- F. Submit three prints of the tracings for approval. Make corrections to tracings as directed and delivered "Auto Positive Tracings" to the architect. "As-Built" drawings shall be furnished in addition to shop drawings.
- G. When the option described in paragraph F., above is not exercised then upon completion of the work, the Contractor shall transfer all marks from the submit a set of clear concise set of reproducible record "AS-BUILT" drawings and shall submit the reproducible drawings with corrections made by a competent draftsman and three (3) sets of black line prints to the Architect or Engineer for review prior to scheduling the final inspection at the completion of the work. The reproducible record "AS-BUILT" drawings shall have the Engineers Name and Seal removed or blanked out and shall be clearly marked and signed on each sheet as follows:

CERTIFIED RECORD DRAWINGS

DATE:

(NAME OF GENERAL CONTRACTOR)

BY: _____
(SIGNATURE)

(NAME OF SUBCONTRACTOR)

BY: _____
(SIGNATURE)

1.16 OPERATING MANUALS

- A. Prepare maintenance manuals in accordance with Division 1 and in addition to the requirements specified in Division 1, include the following information for equipment items:
1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
 2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
 3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
 4. Servicing instructions and lubrication charts and schedules.

1.17 CERTIFICATIONS AND TEST REPORTS

- A. Submit a detailed schedule for completion and testing of each system indicating scheduled dates for completion of system installation and outlining tests to be performed and schedule date for each test. This detailed completion and test schedule shall be submittal at least 90 days before the projected Project completion date.
- B. Test result reporting forms shall be submitted for review no later than the date of the detailed schedule submitted.
- C. Submit 4 copies of all certifications and test reports to the Architect or Engineer for review adequately in advance of completion of the Work to allow for remedial action as required to correct deficiencies discovered in equipment and systems.

- D. Certifications and test reports to be submitted shall include, but not be limited to those items outlined in Section of Division 15.

1.18 MAINTENANCE MANUALS

- A. Coordinate with Division 1 for maintenance manual requirements, unless noted otherwise bind together in “D ring type” binders by National model no. 79-883 or equal, binders shall be large enough to allow ¼” of spare capacity. Three (3) sets of all approved shop drawing submittals, fabrication drawings, bulletins, maintenance instructions, operating instructions and parts exploded views and lists for each and every piece of equipment furnished under this Specification. All sections shall be typed and indexed into sections and labeled for easy reference and shall utilize the individual specification section numbers shown in the Mechanical Specifications as an organization guideline. Bulletins containing information about equipment that is not installed on the project shall be properly marked up or stripped and reassembled. All pertinent information required by the Owner for proper operation and maintenance of equipment supplied by Division 15 shall be clearly and legibly set forth in memoranda that shall, likewise, be bound with bulletins.
- B. Prepare maintenance manuals in accordance with Special Project Conditions, in addition to the requirements specified in Division 15, include the following information for equipment items:
 - 1. Identifying names, name tags designations and locations for all equipment.
 - 2. Valve tag lists with valve number, type, color coding, location and function.
 - 3. Reviewed shop drawing submittals with exceptions noted compliance letter.
 - 4. Fabrication drawings.
 - 5. Equipment and device bulletins and data sheets clearly highlighted to show equipment installed on the project and including performance curves and data as applicable, i.e., description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and model numbers of replacement parts.
 - 6. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
 - 7. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions, servicing instructions and lubrication charts and schedules.
 - 8. Equipment and motor name plate data.
 - 9. Wiring diagrams.
 - 10. Exploded parts views and parts lists for all equipment and devices.
 - 11. Color coding charts for all painted equipment and conduit.
 - 12. Location and listing of all spare parts and special keys and tools furnished to the Owner.

- 13. Furnish recommended lubrication schedule for all required lubrication points with listing of type and approximate amount of lubricant required.
- C. Refer to Division 1 for additional information on Operating and Maintenance Manuals.
- D. Operating and Maintenance Manuals shall be turned over to the Owner or Engineer a minimum of 14 working days prior to the beginning of the operator training period.

1.19 OPERATOR TRAINING

- A. The Contractor shall furnish the services of factory trained specialists to instruct the Owner's operating personnel. The Owner's operator training shall include 12 hours of on site training in three 4 hour shifts.
- B. Before proceeding with the instruction of Owner Personnel, prepare a typed outline in triplicate, listing the subjects that will be covered in this instruction, and submit the outline for review by the Owner. At the conclusion of the instruction period obtain the signature of each person being instructed on each copy of the reviewed outline to signify that he has a proper understanding of the operation and maintenance of the systems and resubmit the signed outlines.
- C. Refer to other Division 15 Sections for additional Operator Training requirements.

1.20 FINAL COMPLETION

- A. At the completion of the work, all equipment and systems shall be tested and faulty equipment and material shall be repaired or replaced. Refer to Sections of Division 15 for additional requirements.
- B. Clean and adjust all air distribution devices and replace all air filters immediately prior to final acceptance.
- C. Touch up and/or refinish all scratched equipment and devices immediately prior to final acceptance.

1.21 CONTRACTOR'S GUARANTEE

- A. Use of the HVAC and Plumbing systems to provide temporary service during construction period will not be allowed without permission from the Owner in writing and if granted shall not be cause warranty period to start, except as defined below.
- B. Contractor shall guarantee to keep the entire installation in repair and perfect working order for a period of one year after its completion and final acceptance, and shall

furnish free of additional cost to the Owner all materials and labor necessary to comply with the above guarantee throughout the year beginning from the date of issue of Substantial Completion, Beneficial Occupancy by the Owner or the Certificate of Final Payment as agreed upon by all parties.

- C. This guarantee shall not include cleaning or changing filters except as required by testing, adjusting and balancing.
- D. All air conditioning compressors shall have parts and labor guarantees for a period of not less than 5 years beyond the date of final acceptance.
- E. Refer to Sections in Division 15 for additional guarantee or warranty requirements.

1.22 TRANSFER OF ELECTRONIC FILES

- A. Project documents are not intended or represented to be suitable for reuse by Architect/Owner or others on extensions of this project or on any other project. Any such reuse or modification without written verification or adaptation by Engineer, as appropriate for the specific purpose intended, will be at Architect/Owner's risk and without liability or legal exposure to Engineer or its consultants from all claims, damages, losses and expense, including attorney's fees arising out of or resulting thereof.
- B. Because data stored in electric media format can deteriorate or be modified inadvertently, or otherwise without authorization of the data's creator, the party receiving the electronic files agrees that it will perform acceptance tests or procedures within sixty (60) days of receipt, after which time the receiving party shall be deemed to have accepted the data thus transferred to be acceptable. Any errors detected within the sixty (60) day acceptance period will be corrected by the party delivering the electronic files. Engineer is not responsible for maintaining documents stored in electronic media format after acceptance by the Architect/Owner.
- C. When transferring documents in electronic media format, Engineer makes no representations as to the long term compatibility, usability or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by Engineer at the beginning of the Project.
- D. Any reuse or modifications will be Contractor's sole risk and without liability or legal exposure to Architect, Engineer or any consultant.
- E. The Texas Board of Architectural Examiners (TBAE) has stated that it is in violation of Texas law for persons other than the Architect of record to revise the Architectural drawings without the Architect's written consent.

It is agreed that “MEP” hard copy or computer-generated documents will not be issued to any other party except directly to the Architect/Owner. The contract documents are contractually copyrighted and cannot be used for any other project or purpose except as specifically indicated in AIA B-141 Standard Form of Agreement Between Architect and Owner.

If the client, Architect/Owner, or developer of the project requires electronic media for “record purposes”, then an AutoCAD based compact disc (“CD”) will be prepared. The “CD” will be submitted with all title block references intact and will be formatted in a “plot” format to permit the end user to only view and plot the drawings. Revisions will not be permitted in this configuration.

- F. At the Architect/Owner’s request, Engineer will prepare one “CD” of electronic media to assist the contractor in the preparation of submittals. The Engineer will prepare and submit the “CD” to the Architect/Owner for distribution to the contractor. All copies of the “CD” will be reproduced for a cost of reproduction fee of Five Hundred Dollars (\$500.00) per “CD”.

The “CD” will be prepared and all title blocks, names and dates will be removed. The “CD” will be prepared in a “.dwg” format to permit the end user to revise the drawings.

- G. This Five Hundred Dollars (\$500.00) per “CD” cost of reproduction will be paid directly from the Contractor to the Engineer. The “CD” will be prepared only after receipt of the Five Hundred Dollars (\$500.00). The Five Hundred Dollars (\$500.00) per “CD” cost of reproduction is to only recover the cost of the manhours necessary to reproduce the documents. It is not a contractual agreement between the Contractor and Engineer to provide any engineering services, nor any other service.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Provide materials and equipment manufactured by a domestic United States manufacturer.
- B. Access Doors: Provide access doors as required for access to equipment, valves, controls, cleanouts and other apparatus where concealed. Access doors shall have concealed hinges and screw driver cam locks.
- C. All access panels located in wet areas such as restrooms, locker rooms, shower rooms, kitchen and any other wet areas shall be constructed of stainless steel.
- D. Access Doors: shall be as follows:
 - 1. Plastic Surfaces: Milcor Style K.

2. Ceramic Tile Surface: Milcor Style M.
3. Drywall Surfaces: Milcor Style DW.
4. Install panels only in locations approved by the Architect.

PART 3 - EXECUTION

3.01 ROUGH-IN

- A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected via reviewed submittals.
- B. Refer to equipment specifications in Divisions 2 through 16 for additional rough-in requirements.

3.02 MECHANICAL INSTALLATIONS

- A. General: Sequence, coordinate, and integrate the various elements of mechanical systems, materials, and equipment. Comply with the following requirements:
 1. Coordinate mechanical systems, equipment, and materials installation with other building components.
 2. Verify all dimensions by field measurements.
 3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for mechanical installations.
 4. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
 5. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
 6. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
 7. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.
 8. Install systems, materials, and equipment to conform with architectural action markings on submittal, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, resolve conflicts and route proposed solution to the Architect for review.

9. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
10. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location and label.
11. Install access panel or doors where units are concealed behind finished surfaces. Access panels and doors are specified.
12. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.
13. Provide roof curbs for all roof mounted equipment. Coordinate with roof construction for pitched roof. Provide roof curb to match roof slope. Refer to architectural drawings and details.
14. The equipment to be furnished under this Specification shall be essentially the standard product of the manufacturer. Where two or more units of the same class of equipment are required, these units shall be products of a single manufacturer; however, the component parts of the system need not be the product of the same manufacturer.
15. The architectural and structural features of the building and the space limitations shall be considered in selection of all equipment. No equipment shall be furnished which will not suit the arrangement and space limitations indicated.
16. Lubrication: Prior to start-up, check and properly lubricate all bearings as recommended by the manufacturer.
17. Where the word "Concealed" is used in these Specifications in connection with insulating, painting, piping, ducts, etc., it shall be understood to mean hidden from sight as in chases, furred spaces or suspended ceilings. "Exposed" shall be understood to mean the opposite of concealed.
18. Identification of Mechanical Equipment:
 - a. Mechanical equipment shall be identified by means of nameplates permanently attached to the equipment. Nameplates shall be engraved laminated plastic or etched metal. Shop drawings shall include dimensions and lettering format for approval. Attachments shall be with escutcheon pins, self-tapping screws, or machine screws.
 - b. Tags shall be attached to all valves, including control valves, with nonferrous chain. Tags shall be brass and at least 1-1/2 inches in diameter. Nameplate and tag symbols shall correspond to the identification symbols on the temperature control submittal and the "as-built" drawings.

3.03 CUTTING AND PATCHING

- A. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.
- B. Perform cutting, fitting, and patching of mechanical equipment and materials required to:
 - 1. Uncover Work to provide for installation of ill-timed Work.
 - 2. Remove and replace defective Work.
 - 3. Remove and replace Work not conforming to requirements of the Contract Documents.
 - 4. Remove samples of installed Work as specified for testing.
 - 5. Install equipment and materials in existing structures.
 - 6. Upon written instructions from the Engineer, uncover and restore Work to provide for Engineer/Owner's observation of concealed Work, without additional cost to the Owner.
 - 7. Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers. Patch finished surfaces and building components using new materials specified for the original installation and experienced Installers; refer to the materials and methods required for the surface and building components being patched; Refer to Section "DEFINITIONS" for definition of "Installer."
- C. Cut, remove and legally dispose of selected mechanical equipment, components, and materials as indicated, including but not limited to removal of mechanical piping, mechanical ducts and HVAC units, plumbing fixtures and trim, and other mechanical items made obsolete by the new Work.
- D. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.
- E. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

3.04 WORK SEQUENCE, TIMING, COORDINATION WITH OWNER

- A. The Owner will cooperate with the Contractor, however, the following provisions must be observed:
 - 1. A meeting will be held at the project site, prior to any construction, between the Owner's Representative, the General Contractor, the Sub-Contractors and the Engineer to discuss Contractor's employee parking space, access, storage of equipment or materials, and use of the Owner's facilities or utilities. The Owner's decisions regarding such matters shall be final.
 - 2. During the construction of this project, normal facility activities will continue in existing buildings until renovated areas are completed. Plumbing, fire

protection, lighting, electrical, communications, heating, air conditioning, and ventilation systems will have to be maintained in service within the occupied spaces of the existing building.

3.05 DEMOLITION AND WORK WITHIN EXISTING BUILDINGS

- A. In the preparation of these documents every effort has been made to show the approximate locations of, and connections to the existing piping, duct, equipment and other apparatus related to this phase of the work. However, this Contractor shall be responsible for verifying all of the above information. This Contractor shall visit the existing site to inspect the facilities and related areas. This Contractor shall inspect and verify all details and requirements of all the Contract Documents, prior to the submission of a proposal. All discrepancies between the Contract Documents and actual job-site conditions shall be resolved by his contractor, who shall produce drawings that shall be submitted to the Architect/Engineer for review. All labor and materials required to perform the work described shall be apart of this Contract.
- B. All equipment and/or systems noted on the Drawings "To Remain" shall be inspected and tested on site to certify its working condition. A written report on the condition of all equipment to remain, including a copy of the test results and recommended remedial actions and costs shall be made by this Contractor to the Architect/Engineer for review.
- C. All equipment and/or systems noted on the Drawings "To Be Removed" shall be removed including, associated pipe and duct pipe and duct hangers and/or line supports. Where duct or pipe is to be capped for future or end of line use, it shall be properly tagged with its function or service appropriately identified. Where existing equipment is to be removed or relocated and has an electric motor or connection, the Electrical Contractor shall disconnect motor or connection, remove wiring to a safe point and this Contractor shall remove or relocate motor or connection along with the equipment.
- D. During the construction and remodeling, portions of the Project shall remain in service. Construction equipment, material tools, extension cords, etc., shall be arranged so as to present minimum hazard or interruption to the occupants of the building. None of the construction work shall interfere with the proper operation of the existing facility or be so conducted as to cause harm or danger to persons on the premises. All fire exits, stairs or corridors required for proper access, circulation or exit shall remain clear of equipment, materials or debris. The General Contractor shall maintain barricades, other separations in corridors and other spaces where work is conducted.
- E. Certain work during the demolition phase of construction may require overtime or night time shifts or temporary evacuation of the occupants. Coordinate and schedule all proposed down time at least seventy-two (72) hours in advance in writing.

- F. Any salvageable equipment as determined by the Owner, shall be delivered to the Owner, and placed in storage at the location of his choice. All other debris shall be removed from the site immediately.
- G. Equipment, piping or other potential hazards to the working occupants of the building shall not be left overnight outside of the designated working or construction area.
- H. Make every effort to minimize damage to the existing building and the owner's property. Repair, patch or replace as required any damage that might occur as a result of work at the site. Care shall be taken to minimize interference with the Owner's activities during construction and to keep construction disrupted areas to a minimum. Coordinate with the Owner and other trades in scheduling and performance of the work.
- I. Include in the contract price all rerouting of existing pipe, duct, etc., and the reconnecting of the existing equipment and plumbing fixtures as necessitated by field conditions to allow the installation of the new systems regardless of whether or not such rerouting, reconnecting or relocating is shown on the drawings. Furnish all temporary pipe, duct, controls, etc., as required to maintain heating, cooling, ventilation and plumbing services for the existing areas with a minimum of interruption.
- J. All existing plumbing fixtures, pipe, duct, materials, equipment, controls and appurtenances not included in the remodel or alteration areas are to remain in place.
- K. Pipe, duct, equipment and controls serving mechanical, plumbing and owner's equipment, etc., which is to remain but which is served by pipe, duct, equipment and controls that are disturbed by the remodeling work, shall be reconnected in such a manner as to leave this equipment in proper operating condition.
- L. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and operating system in cooperation with other trades with a minimum of disruption or downtime.
- M. Refer to Architectural "Demolition and/or Alteration" plans for actual location of walls, ceiling, etc., being removed and/or remodeled.

END OF SECTION

SECTION 15060

MECHANICAL DEMOLITION FOR REMODELING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Mechanical demolition.
- B. The drawings do not show all demolition work required. The contractor shall make himself familiar with the required scope of work to accomplish the work required by these documents. All demolition work implied or required shall be included in the scope of this contract.
- C. Outages of services as required by the new installation will be permitted but only at a time approved by the Owner. The contractor shall allow the Owner 2 weeks in order to schedule required outages. The time allowed for outages will not be during normal working hours unless otherwise approved by the Owner. All costs of outages, including overtime charges, shall be included in the contract amount.

1.02 RELATED SECTIONS

- A. Section 01120 – Alteration Project Procedures.
- B. Section 02072 – Minor Demolition for Remodeling.

1.03 WORK SEQUENCE, TIMING, COORDINATION WITH OWNER

- A. The Owner will cooperate with the Contractor, however, the following provisions must be observed:
 - 1. During the construction of this project, normal facility activities will continue in existing buildings until new buildings or renovated areas are completed. Plumbing, fire protection, lighting, electrical, communications, heating, air conditioning, and ventilation systems will have to be maintained in service within the occupied spaces of the existing building.
 - 2. A meeting will be held at the project site, prior to any construction, between the Owner's Representative, the General Contractor, the Sub-Contractors and the Engineer to discuss Contractor's employee parking space, access, storage of equipment or materials, and use of the Owner's facilities or utilities. The Owner's decisions regarding such matters shall be final.

1.04 DEMOLITION AND WORK WITHIN EXISTING BUILDINGS

- A. In the preparation of these documents every effort has been made to show the approximate locations of, and connections to the existing piping, duct, equipment and other apparatus related to this phase of the work. However, this Contractor shall be responsible for verifying all of the above information. This Contractor shall visit the existing site to inspect the facilities and related areas. This Contractor shall inspect and verify all details and requirements of all the Contract Documents, prior to the submission of a proposal. All discrepancies between the Contract Documents and actual job-site conditions shall be resolved by his contractor, who shall produce drawings which shall be submitted to the Architect/Engineer for review. All labor and materials required to perform the work described shall be apart of this Contract.
- B. All equipment and/or systems noted on the Drawings "To Remain" shall be inspected and tested on site to certify its working condition. A written report on the condition of all equipment to remain, including a copy of the test results and recommended remedial actions and costs shall be made by this Contractor to the Architect/Engineer for review.
- C. All equipment and/or systems noted on the Drawings "To Be Removed" should be removed including, associated pipe and duct pipe and duct hangers and/or line supports. Where duct or pipe is to be capped for future or end of line use, it shall be properly tagged with its function or service appropriately identified. Where existing equipment is to be removed or relocated and has an electric motor or connection, the Electrical Contractor shall disconnect motor or connection, remove wiring to a safe point and this Contractor shall remove or relocate motor or connection along with the equipment.
- D. During the construction and remodeling, portions of the Project shall remain in service. Construction equipment, material tools, extension cords, etc., shall be arranged so as to present minimum hazard or interruption to the occupants of the building. None of the construction work shall interfere with the proper operation of the existing facility or be so conducted as to cause harm or danger to persons on the premises. All fire exits, stairs or corridors required for proper access, circulation or exit shall remain clear of equipment, materials or debris. The General Contractor shall maintain barricades, other separations in corridors and other spaces where work is conducted.
- E. Certain work during the demolition and construction phases of construction may require overtime or night time shifts or temporary evacuation of the occupants. Coordinate and schedule all proposed down time with the Project Administrator at least seventy-two (72) hours in advance in writing.
- F. Any salvageable equipment as determined by the Owner, shall be delivered to the Owner, and placed in storage at the location of his choice. All other debris shall be removed from the site immediately.

- G. Equipment, piping or other potential hazards to the occupants of the building shall not be left overnight outside of the designated working or construction area.
- H. Make every effort to minimize damage to the existing building and the owner's property. Repair, patch or replace as required any damage which might occur as a result of work at the site. Care shall be taken to minimize interference with the Owner's activities during construction and to keep construction disrupted areas to a minimum. Coordinate with the Owner and other trades in scheduling and performance of the work.
- I. Include in the contract price all rerouting of existing pipe, duct, etc., and the reconnecting of the existing equipment and plumbing fixtures as necessitated by field conditions to allow the installation of the new systems regardless of whether or not such rerouting, reconnecting or relocating is shown on the drawings. Furnish all temporary pipe, duct, controls, etc., as required to maintain heating, cooling, ventilation and plumbing services for the existing areas with a minimum of interruption.
- J. All existing plumbing fixtures, pipe, duct, materials, equipment, controls and appurtenances not included in the remodel or alteration areas are to remain in place.
- K. Pipe, duct, equipment and controls serving mechanical, plumbing and owner's equipment, etc., which is to remain but which is served by pipe, duct, equipment and controls that are disturbed by the remodeling work, shall be reconnected in such a manner as to leave this equipment in proper operating condition.
- L. No portion of the **fire protection systems** shall be turned off, modified or changed in any way without the express knowledge and written permission of the Owner's representative in order to protect systems that shall remain in service.
- M. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and operating system in cooperation with other trades with a minimum of disruption or downtime.
- N. Refer to Architectural "Demolition and/or Alteration" plans for actual location of walls, ceiling, etc., being removed and/or remodeled.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials and equipment for patching and extending work: As specified in individual Sections.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Field verify measurements and piping arrangements are as shown on Drawings.
- B. Verify that abandoned piping and equipment serve only abandoned facilities.
- C. Demolition Drawings are based on casual field observation and existing record documents. Report discrepancies to Owner before disturbing existing installation.
- D. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION

- A. Disconnect mechanical systems in walls, floors, and ceilings scheduled for removal.
- B. Coordinate utility service outages with Utility Company.
- C. Provide temporary connections to maintain existing systems in service during construction. When work must be performed on energized equipment, use personnel experienced in such operations.
- D. Existing Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Obtain permission from Owner at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.
- E. Existing Fire Alarm System: Maintain existing system in service until new system is accepted. Disable system only to make switchovers and connections. Notify Owner and local fire service at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

3.03 DEMOLITION AND EXTENSION OF EXISTING MECHANICAL WORK

- A. Demolish and extend existing mechanical work under provisions of Section 01120, Section 02072, and this Section.
- B. Remove, relocate, and extend existing installations to accommodate new construction.
- C. Remove abandoned piping to source of supply.

- D. Remove exposed abandoned piping systems, including abandoned systems above accessible ceiling finishes. Cut systems flush with walls and floors, and patch surfaces.
- E. Repair adjacent construction and finishes damaged during demolition and extension work.
- F. Maintain access to existing installations which remain active. Modify installation or provide access panels as appropriate.
- G. Extend existing installations using materials and methods compatible with existing installations, or as specified.

3.04 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment which remain or are to be reused.

3.05 INSTALLATION

- A. Install relocated materials and equipment under the provisions of Section 01120.

3.06 REMOVAL OF MATERIALS

- A. The contractor shall modify, remove, and/or relocate all materials and items so indicated on the drawings or required by the installation of new facilities. All removals and/or dismantling shall be conducted in a manner as to produce maximum salvage. Salvage materials shall remain the property of the Owner, and shall be delivered to such destination as directed by the Owner. Materials and/or items scheduled for relocation and which are damaged during dismantling or reassembly operations shall be repaired and restored to good operative condition. The contractor may, at his discretion and upon the approval of the Owner, substitute new materials and/or items of like design and quality in lieu of materials and/or items to be relocated.
- B. All items which are to be relocated shall be carefully removed in reverse to original assembly or placement and protected until relocated. The contractor shall clean and repair and provide all new materials, fittings, and appurtenances required to complete the relocations and to restore to good operative order. All relocations shall be performed by workmen skilled in the work and in accordance with standard practice of the trades involved.
- C. When items scheduled for relocation are found to be in damaged condition before work has been started on dismantling, the contractor shall call the attention of the Owner to such items and receive further instructions before removal. Items damaged in repositioning operations are the contractor's responsibility and shall

be repaired or replaced by the contractor as approved by the Owner, at no additional cost to the Owner.

- D. Service lines and wiring to items to be removed, salvaged, or relocated shall be removed to points indicated on the drawings, specified, or acceptable to the Owner. Service lines and wiring not scheduled for reuse shall be removed to the points at which reuse is to be continued or service is to remain. Such services shall be sealed, capped, or otherwise tied-off or disconnected in a safe manner acceptable to the Owner. All disconnections or connections into the existing facilities shall be done in such a manner as to result in minimum interruption of services to adjacent occupied areas. Services to existing areas or facilities which must remain in operation during the construction period shall not be interrupted without prior specific approval of the Owner as hereinbefore specified.
- E. Certain work during the demolition phase of construction may require overtime or nighttime shifts or temporary evacuation of the occupants. Coordinate and schedule all proposed down time with the Owner's Representative at least 72 hours in advance.
- F. Make every effort to minimize damage to the existing building and the Owner's property. Repair, patch, or replace as required any damage which might occur as a result of work at the site. Care shall be taken to minimize interference with the Owner's activities during construction. Cooperate with the Owner and other trades in scheduling and performance of the work.
- G. Include in the contract price all rerouting of existing conduits, wiring, outlet boxes, fixtures, etc., and the reconnecting of existing fixtures as necessitated by field conditions to allow the installation of the new systems. Furnish all temporary conduit, wiring, boxes, etc., as required to maintain lighting and power service for the existing areas with a minimum of interruption. Remove wire and conduit back to nearest accessible active junction box and extend to existing homeruns as required.
- H. The contractor shall be responsible for loss or damage to the existing facilities caused by him and his workmen, and shall be responsible for repairing such loss or damage. The contractor shall send proper notices, make necessary arrangements, and perform other services required for the care, protection and in-service maintenance of all electrical services for the new and existing facilities. The contractor shall erect temporary barricades, with necessary safety devices, as required to protect personnel from injury, removing all such temporary protection upon completion of the work.
- I. Where existing construction is removed to provide working and extension access to existing utilities, contractor shall remove doors, piping, conduit, outlet boxes, wiring, light fixtures, air conditioning ductwork and equipment, etc., to provide this access and shall reinstall same upon completion of work in the areas affected.

- J. Where partitions, walls, floors, or ceilings of existing construction are being removed, all contractors shall remove and reinstall in locations approved by the Architect all devices required for the operation of the various systems installed in the existing construction.

END OF SECTION

SECTION 15260

PIPING INSULATION

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.
- B. The Basic Materials and Methods, Section 15050, are included as a part of this Section as though written in full in this document.

1.02 SCOPE

- A. Scope of the Work shall include the furnishing and complete installation of the equipment covered by this Section, with all auxiliaries, ready for owner's use.
- B. Furnish and install piping insulation to:
 - 1. Chilled water piping.
 - 2. All pipes subject to freezing conditions shall be insulated.
- C. Work specified elsewhere.
 - 1. Painting.
 - 2. Pipe hangers and supports.
- D. For insulation purpose piping is defined as the complete piping system including supplies and returns, pipes, valves, automatic control valve bodies, fittings, flanges, strainers, thermometer well, unions, reducing stations, and orifice assemblies.

1.03 WARRANTY

- A. Warrant the Work specified herein for one year against becoming unserviceable or causing an objectionable appearance resulting from either defective or nonconforming materials or workmanship.
- B. Defects shall include, but not be limited to, the following:
 - 1. Mildewing.
 - 2. Peeling, cracking, and blistering.
 - 3. Condensation on exterior surfaces.

1.04 SUBMITTALS

- A. SHOP DRAWINGS: Indicate size, material, and finish. Show locations and installation procedures. Include details of joints, attachments, and clearances.
- B. PRODUCT DATA: Submit schedules, charts, literature, and illustrations to indicate the performance, fabrication procedures, project variations, and accessories.

1.05 DELIVERY AND STORAGE

- A. DELIVERY: Deliver undamaged materials in the manufacturer's unopened containers. Containers shall be clearly labeled with the insulation's flame and smoke ratings.

PART 2 - PRODUCTS

- 2.01 It is the intent of these specifications to secure superior quality workmanship resulting in an absolutely satisfactory installation of insulation from the standpoint of both function and appearance. Particular attention shall be given to valves, fittings, pumps, etc., requiring low temperature insulation to insure full thickness of insulation and proper application of the vapor seal. All flaps of vapor barrier jackets and/or canvas covering must be neatly and securely smoothed and sealed down.
- 2.02 The type of insulation and its installation shall be in strict accordance with these specifications for each service, and the application technique shall be as recommended by the manufacturer. All insulation types, together with adhesives and finishes shall be submitted and approved prior to installation.
- 2.03 A sample quantity of each type of insulation and each type application shall be installed and approval secured prior to proceeding with the main body of the work. Condensation caused by improper installation of insulation shall be corrected by Installing Contractor. Any damage caused by condensation shall be made good at no cost to the Owner or Architect/Engineer.
- 2.04 All insulation shall have composite (insulation, jacket or facing, and adhesive used to adhere the facing or jacket to insulation) fire and smoke hazard as tested by Procedure ASTM E084, NFPA 255 and UL 723 not exceeding:
 - Flame Spread 25
 - Smoke Developed 50
- 2.05 Accessories, such as adhesives, mastics and cements shall have the same component ratings as listed above.
- 2.06 All products or their shipping cartons shall have a label affixed, indicating flame and smoke ratings do not exceed the above requirements.

2.07 APPROVED MANUFACTURERS

- A. Calcium silicate materials shall be as manufactured by Johns Manville.
- B. Glass fiber materials shall be as manufactured by Johns Manville, Knauf, or Owens-Corning and shall have the same thermal properties, density, fire rating, vapor barrier, etc., as the types specified herein, subject to review by the Engineer.
- C. Adhesives shall be as manufactured by Childers, Foster, HB Fuller or Armstrong, and shall have the same adhesive properties, fire rating, vapor seal, etc., as the types specified herein, subject to review by the Engineer.
- D. Armaflex elastomeric cellular thermal insulation by Armstrong.
- E. Phenolic foam insulation shall be as manufactured by Kooltherm Insulation (Koolphen).
- F. Metal jacketing and fitting covers shall be as manufactured by Childers or RPR Products.

2.08 MATERIALS

- A. CHILLED WATER PIPE: Provide fiberglass pipe insulation with ASJ-SSL jacket or phenolic foam with ASJ and all joints sealed.
- B. METAL JACKETING: Utilize Childers “Strap-On” jacketing. Provide preformed fitting covers for all elbows and tees.

PART 3 - EXECUTION

- 3.01 All insulation shall be installed in accordance with the manufacturers’ recommendations and printed installation instructions, including high density inserts at all hangers and pipe supports to prevent compression of insulation.
- 3.02 All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Provide all items required as per manufacturers requirements.
- 3.03 Pipes located outdoors or in tunnels shall be insulated same as concealed piping; and in addition shall have a jacket of 0.016 inch thick, smooth aluminum with longitudinal modified Pittsburg Z-Lock seam and 2 inch overlap. Jacketing shall be easily removed and replaced without damage. All butt joints shall be sealed with gray silicone. Galvanized banding is not acceptable.

3.04 All insulated piping located over driveways shall have an aluminum shield permanently banded over insulation to protect it from damage from car antennas.

3.05 WATER PIPE INSULATION INSTALLATION

- A. The insulation shall be applied to clean, dry pipes with all joints firmly butted together. Where piping is interrupted by fittings, flanges, valves or hangers and at intervals not to exceed 25 feet on straight runs, an isolating seal shall be formed between the vapor barrier jacket and the bare pipe. The seal shall be by the applications of adhesive to the exposed insulation joint faces, carried continuously down to and along 4 inches of pipe and up to and along 2 inches of jacket.
- B. Pipe fittings and valves shall be insulated with pre-molded or shop fabricated glass fiber covers finished with two brush coats of vapor barrier mastic reinforced with glass fabric.
- C. All under lap surfaces shall be clean and free of dust, etc. before the SSL is sealed. These laps shall be firmly rubbed to insure a positive seal. A brush coat of vapor retarder shall be applied to all edges of the vapor barrier jacket.

3.06 FIRE RATED INSULATION

- A. All pipe penetrations through walls and concrete floors shall be fire rated by applying USG Thermafiber in the space between the concrete and the pipe.
- B. The fire rating shall be additionally sealed by using 3M brand model CP 25 or 303 fire barrier caulk and putty.
- C. All fire rating material shall be insulated in accordance with manufacturer's printed instructions.

PART 4 - SCHEDULES

4.01 LOW TEMPERATURE SURFACES THICKNESS	MINIMUM BASED ON FIBERGLASS	INSULATION
A. Chilled Water Piping:		
(1) Located outdoors:	2 inch	
(2) Located indoors:		
(a) 4 inch and smaller:	1½ inch	
(b) Larger than 4 inch:	2 inch	

END OF SECTION

SECTION 15290

DUCT INSULATION

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Ductwork system insulation.

1.02 RELATED SECTIONS

- A. Section 15050 - Basic Materials and Methods
- B. Section 15170 - Motors and Motor Controllers
- C. Section 15190 - System Identification and Pipe Marking

1.03 QUALITY ASSURANCE

- A. **Installer's Qualifications:** Firm with at least 5 years successful installation experience on projects with mechanical insulations similar to that required for this project.
- B. **Flame/Smoke Ratings:** Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics and adhesives) with flame-spread index of 25 or less, and smoke-developed index of 50 or less, as tested by ASTM E 84 (NFPA 255) method.
 - 1. **Exception:** Outdoor mechanical insulation may have flame spread index of 75 and smoke developed index of 150.
- C. Duct and plenum insulation shall comply with minimum R-value requirements of 2009 International Energy Conservation Code.
- D. Adhesive and other material shall comply with NFPA and NBFU Standards No. 90A and 90B.

1.04 SUBMITTALS

- A. **SHOP DRAWINGS:** Indicate size, material, and finish. Show locations and installation procedures. Include details of joints, attachments, and clearances.
- B. **PRODUCT DATA:** Submit schedules, charts, literature, and illustrations to indicate the performance, fabrication procedures, product variations, and

accessories.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver insulation, coverings, cements, adhesives, and coatings to site in unopened containers with manufacturer's stamp, clearly labeled with flame and smoke rating, affixed showing fire hazard indexes of products.
- B. Protect insulation against dirt, water and chemical and mechanical damage. Do not install damaged or wet insulation; remove from project site.

PART 2 - PRODUCTS

2.01 GENERAL DESCRIPTION

- A. The type of insulation and its installation shall be in strict accordance with these specifications for each service, and the application technique shall be as recommended by the manufacturer. All insulation types, together with adhesives and finishes shall be submitted and approved before any insulation is installed.
- B. A sample quantity of each type of insulation and each type of application shall be installed and approval secured prior to proceeding with the main body of the work.

2.02 ACCEPTABLE MANUFACTURERS

- A. Glass fiber materials shall be as manufactured by Knauf, Certain-Teed, Johns-Manville or Owens-Corning and shall have the same thermal properties, density, fire rating, vapor barrier, etc., as the types specified herein, subject to review by the Engineer.
- B. Adhesives shall be as manufactured by Minnesota Mining, Arabol, Benjamin-Foster, Armstrong or Insulmastic, Inc., and shall have the same adhesive properties, fire rating, vapor seal, etc., as the types specified herein, subject to review by the Engineer.
- C. Ceramic fiber materials shall be as manufactured by Primer Refractories, A.P. Green Refractories or approved equal.

PART 3 - EXECUTION

3.01 GENERAL

- A. All insulation shall be installed in accordance with the manufacturer's recommendations and printed installation instructions.

- B. All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Provide all items required as per manufacturer's requirements.

3.02 EXTERNAL DUCT INSULATION

- A. Fasten all longitudinal and circumferential laps with outward clinching staples 3" on center. On rectangular ducts over 24" wide apply as above and hold insulation in place on bottom side with mechanical pins and clips on 12" centers.
- B. Seal all joints, fastener penetrations and other breaks in vapor barrier with 3 inch wide strips of white glass fabric embedded between two coats of vapor barrier mastic, Childers CP-30 or approved equal.
- C. All external duct insulation shall be Johns Manville Type 100 fiberglass duct wrap insulation with reinforced aluminum facing or approved equal.
- D. External duct wrap is required on all outside air ducts and supply air ducts that are not internally insulated. Duct wrap shall be provided as follows:
 - 1. 1½" thick, 1.0 PCF density minimum when ducts are located in conditioned spaces.
 - 2. 2" thick with a minimum installed R-value of 6 when ducts are located in unconditioned spaces, such as ceiling plenum space.

3.03 DUCT LINER

- A. Duct liner shall be kept clean and dry during transportation, storage and installation. Care should be taken to protect the liner from exposure to the elements or damage from mechanical abuse.
- B. All portions of duct designed to receive duct liner shall be completely covered with liner as specified. The smooth, black, acrylic-coated surfaces with flexible glass cloth reinforcement shall face the airstream. All duct liner shall be cut to assure tight, overlapped corner joints. The top pieces shall be supported by the sidepieces. Duct liner shall be installed following the guidelines in the NAIMA "Duct Liner Installation Standard".
- C. The duct liner shall be tested according to erosion test method in UL 181 and shall be guaranteed to withstand velocities in the duct system up to 5000 fpm without surface erosion.
- D. Duct liner shall be adhered to the sheet metal with full coverage of an approved adhesive that conforms to ASTM C 916, and all exposed leading edges and transverse joints shall be coated with Permacote factory-applied or field-applied

edge coating and shall be neatly butted without gaps. Shop or field cuts shall be liberally coated with Johns Manville SuperSeal[®] duct butter and Edge Treatment or approved adhesive.

- E. Metal nosings shall be securely installed over transversely oriented liner edges facing the airstream at forward discharge and at any point where lined duct is preceded by unlined duct.
- F. When velocity exceeds 4000 fpm (20.3 m/sec), use metal nosing on every leading edge. Nosing may be formed on duct or be channel or zee attached by screws, rivets or welds.
- G. The liner shall further be secured with Graham welding pins and washers on not more than 18 inch centers both vertical and horizontal surfaces, and the pins and washers shall be pointed up with adhesive.
- H. Duct liner shall be Johns Manville Linacoustic RC fiberglass duct liner with factory-applied edge coating or approved equal. The liner shall meet the Life Safety Standards as established by NFPA 90A and 90B, FHC 25/50 and Limited Combustibility and the air stream surface coating should contain an immobilized, EPA-registered, anti microbial agent so it will not support microbial growth as tested in accordance with ASTM G21 and G22. The duct liner shall conform to the requirements of ASTM C 1071, with an NRC not less than .70 as tested per ASTM C 423 using a Type "A" mounting, and a thermal conductivity no higher than .25 BTU•in/(hr•ft²•°F) at 75°F mean temperature.
- I. Duct liner is required on all rectangular return air ductwork, return air boots and supply air ductwork downstream of the terminal units. Duct liner shall be provided as follows:
 - 1. 1" Thick, 1.5 PCF density minimum when ducts are located in conditioned spaces.
 - 2. 1 ½" Thick with a minimum installed R-value of 6 when ducts are located in unconditioned spaces, such as ceiling plenum space.
 - 3. 2" Thick with a minimum installed R-value of 8 when ducts are located outdoors.
- J. Line supply and return ductwork at connection of HVAC unit to a point of 15 feet upstream and downstream of the equipment with Johns Manville, Linacoustic HP with an R-value of 5 or approved equal for thermal insulation and noise control. The liner shall meet the safety standards as indicated above with NRC not less than 0.75 as tested per ASTM C423 using a type "A" mounting and thermal conductivity no higher than 0.24 BTU•in/(hr•ft²•F) at 75°F mean temperature. Attach with full cover coat of cement, duct dimensions up to 16 inches, provide stick clips or screws and cap for dimension over 16 inches, space 16 inches o.c. maximum. Provide sheet metal liner cap over all leading edges of internal

insulation exposed to air stream.

3.04 AIR DEVICE AND MISCELLANEOUS DUCT INSULATION

- A. The backside of all supply air devices shall be insulated with taped and sealed 1½ inch thick external duct wrap.
- B. The contractor shall install an additional layer of 1½ inch thick external fiberglass duct wrap on any portion of the supply air, return air, outside air, or exhaust air system that has condensation forming during any period of operation. The insulation shall be taped and sealed and located until all evidence of the condensation had been eliminated at no additional cost to the owner.

END OF SECTION

SECTION 15365

FM-200 FIRE SUPPRESSION SYSTEM

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.
- B. The Basic Materials and Methods, Section 15050, are included as a part of this Section as though written in full in this document.

1.02 RELATED SECTIONS

- A. Section 09900 – Painting.
- B. Section 15140 – Supports and Anchors.
- C. Section 15190 – System Identification and Pipe Marking.
- D. Section 15240 – Sound and Vibration Control.
- E. Section 15990 – Testing, Adjusting and Balancing.
- F. Section 16721 – Fire Alarm and Smoke Detection System.

1.03 SCOPE

- A. Scope of the Work shall include the furnishing and complete installation of the equipment covered by this Section, with all auxiliaries, ready for owner's use.
- B. This specification and NFPA 2001 (latest edition) define the requirements for a total flooding FM-200 fire suppression system. This is a fixed extinguishing system for computer rooms, below computer and control room floors, and similar occupancies. It is not intended for combustibles with deep seated fire potentials.

PART 2 - PRODUCTS

- 2.01 The contractor shall furnish, install, and test a complete and ready for operation FM-200 fire suppression system, including charged FM-200 agent storage containers, piping, nozzles, control panel, detectors, wiring, annunciators, alarms, and all other equipment necessary for a completely operational system free from defects.

2.02 This installation shall be made in accordance with applicable National Fire Protection Association Standards (latest edition) and the State of Texas.

No. 2001 – 1993 Edition – FM-200 Fire Suppression Systems

No. 70 - National Electrical Code

No. 72A - Local Protective Signaling Systems

No. 72E - Automatic Fire Detectors

2.03 All equipment and devices used shall be listed for their intended use in either the UL Fire Protection Equipment List or the Factory Mutual Approval Guide. All equipment shall be manufactured and/or supplied by Fike Protection Systems (281) 895-8044 or equal. Products by other reliable manufacturers, other materials, and other methods, will be accepted as outlined, provided they have equal capacity, construction, and performance. However, under no circumstances shall any substitution be made without the written permission of the Architect and Engineer. Request for prior approval must be made in writing 10 days prior to the bid date without fail.

2.04 All valves operated automatically shall be provided with independent means for manual operation, except for "squib" operated devices.

2.05 The system shall be a total flooding FM-200 system designed to provide a uniform concentration of 7.2% at 70°F for all required areas, in 10 seconds or less after discharge is initiated.

2.06 Detection shall consist of photoelectric detectors with spacing of 250 square feet per detector with a minimum of two per space. All information, such as air changes per minute and total CFM, must be taken into account for the quantity of detectors, per NFPA 72E. Then 1/2 of this quantity or the maximum spacing of one per 250 square feet shall be used, whichever results in a greater number of detectors.

2.07 The system shall include a standby power supply. Upon loss of normal power supplying the control unit, the system shall automatically transfer to standby battery power supplied by the control unit and alarm the transfer. The standby system shall be capable of staying on-line for 24 hours and then operate the system for 10 minutes in the alarm condition.

2.08 Storage containers and distribution piping shall be in accordance with the latest requirements listed in NFPA Standard 2001. All discharge piping and fillings shall be galvanized. All fittings shall be 300 pound extra heavy.

2.09 All piping shall be internally swabbed or blown free of residual fabrication oil or particle matter prior to nozzles or discharge devices being installed.

2.10 The area of unclosable openings shall be minimized with all doors and windows weather-stripped, and where not used on a daily basis, they shall be sealed. Ventilating ducts shall

be closed with automatic dampers activated by the FM-200 discharge. The dampers and the control wiring of these dampers are covered under separate specification sections.

- 2.11 Contractor shall provide instruction plates detailing emergency procedures at each system control panel and at each hazard area manual discharge station/abort switch location. Permanent nameplates shall be used in the control panel to identify control logic units, contacts, and major circuits.
- 2.12 The FM-200 control unit shall control circuits to the detectors, time delays, initiators, manual discharge switches, alarm horns and lights, pressure switches, and other required equipment. All such circuits shall be supervised so that a visible and audible trouble signal occurs at the control unit should a fault occur. FM-200 control panel shall be single area panel located where shown on the drawings. Panel shall be sized to house all controls, such as time delays, detection/suppression, and auxiliary relays. The control panel shall be Fike part number 10-051-G-1. Control panel shall be UL and/or FM listed and shall include the following:
- A. Verified or counting detection. Cross-zoning will not be accepted.
 - B. Class "A" wiring of the initiating circuit with a separate conduit return loop to the control panel.
 - C. Eight diagnostic LED's shall be a standard feature within the panel.
 - D. Container disable switch per hazard. This switch shall be supervised.
- 2.13 Abort Station
- A. Abort stations shall be located where shown on drawings and shall always be located within the hazard they protect.
 - B. Abort station shall digitally display the time remaining prior to FM-200 discharge. Depressing the abort station shall recycle the timer to the maximum setting and hold the delay while pressure is maintained.
- 2.14 Manual Station Discharge
- A. Immediate discharge occurs.
 - B. Bells Sound.
 - C. Horn/strobes are activated.
 - D. Auxiliary relays.

- E. FM-200 strobes are activated.
 - F. Shut downs occur.
- 2.15 Audible devices shall be as follows:
- A. Bell shall be 24 V.DC, 6", 89 dBA 10 feet.
 - B. Horn/strobes shall be 90 dBA 10 feet.
 - C. FM-200 strobes shall be located where shown on drawings.
- 2.16 All FM-200 containers over 100 lb. in size shall include liquid level indicators. These indicators shall precisely show the level of agent in the container without the need of scales or the removal of these cylinders. A calibrated liquid reading device shall not be accepted. All FM-200 containers shall also include a supervised low pressure switch to monitor internal cylinder pressure.
- A. FM 200 containers shall be located on the floor where shown on the drawings.
- 2.17 Systems Design
- A. The design shall include the capability of the FM-200 system to operate properly without shutting off computer power, air conditioning, blowers, or control equipment.
 - B. Design information to be submitted for Engineer's approval shall include the "Sequence of Operation", "Bill of Materials", and drawings.
- 2.17 All details of system design shall be shown on the plan drawings as follows:
- A. Actual Area (ft²)
 - B. Actual Volume (ft³)
 - C. Pounds of FM-200 agent
 - D. Filling density of container
 - E. Air flow
 - F. Maximum pipe length (ft)
 - G. Hydraulic calculations
 - H. Type of Nozzles

- I. Piping details
- J. Pressure of system
- K. Size and type of pipe
- L. Number of fittings (elbows, tees, etc.)
- M. Routing of piping including indication that system does not exceed the piping limitations
- N. Equipment used
- O. Location of detectors
- P. Location of gas supply
- Q. Location of manual releases and abort switches
- R. Location of power supply
- S. Electrical wiring details
- T. Standby power details
- U. Interlocks with:
 - Air conditioning
 - Electrical Equipment
 - Building Fire Alarm

2.18 SUBMITTALS

- A. Submit shop drawings in accordance with Section 15050.
- B. Submit shop drawings of entire FM-200 fire suppression system including calculations to Architects/Engineer.
- C. Provide Architect with six complete sets of final approved shop drawings before starting installation.

PART 3 - EXECUTION

- 3.01 All equipment shall be installed in accordance with the manufacturers recommendations and printed installation instructions.
- 3.02 All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Provide all items required as per manufacturers

requirements.

3.03 TRAINING

- A. Owner's people shall be fully briefed in the normal start-up of the system, the operation, normal and emergency shutdown, and maintenance of the equipment.
- B. Routine maintenance, yearly maintenance and spring start-up shall be fully discussed and documented.
- C. Names of those instructed and dates, as well as a list of information handed over to the owner, shall be included in the final report.

3.04 TESTING

- A. After the installation is complete, the system shall be inspected by factory trained personnel in accordance with the manufacturer's recommended procedures.
- B. All wiring shall be tested for proper connection, continuity, and resistance to ground.
- C. The complete system shall be tested by the contractor in the presence of the Owner and the Engineer, and all functions including system and equipment interlocks must be operational.
- D. Contractor shall provide all necessary labor, apparatus, and instrumentation for the test.
- E. A test evaluation team consisting of Engineer's, contractor, distributor, and insurance representative shall meet before the test to establish ground rules and the method of conducting the test in accordance with this specification and manufacturer's recommendations.
- F. Form 26F-4, FM-200 Design and Test Summary, shall be prepared for the acceptance test and completed upon successful test.
- G. The hazards shall be tested for room integrity by use of a fan pressurization unit. The test shall be performed as described in NFPA 2001. Six (6) hours of testing shall be included. These tests shall be recorded and distributed in a test result format. Should these tests fail, the Fire Protection Contractor shall help determine the cause so the General Contractor may address it.
- H. Testing shall be performed prior to computer equipment installation.
- I. Bid shall include all applicable taxes, permits, and fees.

- J. At a minimum, one two-hour educational seminar shall be given to the owner at his direction.
- K. The FM-200 contractor shall be responsible for testing all interconnect shut down wiring for the following equipment: V.A.V. boxes, self-contained H.V.A.C. units, building H.V.A.C. system, building Fire Alarm system, power distributing unit(s) and FM-200 dampers etc.

3.05 CONTRACTOR QUALIFICATIONS

- A. The FM-200 contractor bid shall include the name of the person providing the proposal, and the designer who will “stamp” the drawings. These persons SHALL be a minimum of a N.I.C.E.T. level 3 in Special Hazards, with a State of Texas Planners License.

END OF SECTION

SECTION 15410

PLUMBING PIPING AND VALVES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Pipe and pipe fittings.
- B. Valves.
- C. Sanitary sewer piping system.
- D. Domestic water piping system.
- E. Excavation and backfill.

1.02 RELATED SECTIONS

- A. Section 15140 - Supports and Anchors.
- B. Section 15190 - Mechanical Identification.
- C. Section 15240 - Vibration Isolation.
- D. Section 15260 - Piping Insulation.
- E. Section 15430 - Plumbing Specialties.
- F. Section 15440 - Plumbing Fixtures.
- G. Section 15450 - Plumbing Equipment.

1.03 REFERENCES

- A. ANSI B31.1 - Power Piping.
- B. ANSI B31.9 - Building Service Piping.
- C. ASME - Boiler and Pressure Vessel Code.
- D. ASME Sec. 9 - Welding and Brazing Qualifications.

- E. ASME B16.1 - Cast Iron Pipe Flanges and Flanged Fittings Class 25, 125, 250 and 800.
- F. ASME B16.3 - Malleable Iron Threaded Fittings.
- G. ASME B16.4 - Cast Iron Threaded Fittings Class 125 and 250.
- H. ASME B16.22 - Wrought Copper and Bronze Solder-Joint Pressure Fittings
- I. ASTM A47 - Ferritic Malleable Iron Castings.
- J. ASTM A53 - Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless.
- K. ASTM A74 - Cast Iron Soil Pipe and Fittings.
- L. ASTM B32 - Solder Metal.
- M. ASTM B42 - Seamless Copper Pipe.
- N. ASTM B306 - Copper Drainage Tube (DWV).
- O. ASTM D1785 - Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedule 40, 80, and 120.
- P. ASTM D2241 - Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR).
- Q. ASTM D2466 - Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
- R. ASTM D2564 - Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
- S. ASTM D2729 - Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- T. ASTM D2846 - Chlorinated Polyvinyl Chloride (CPVC) Pipe, Fittings, Solvent Cements and Adhesives for Potable Hot Water Systems.
- U. ASTM F493 - Solvent Cements for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe and Fittings.
- V. AWWA C111- Rubber-Gasket Joints for Ductile Iron and Gray-Iron Pressure Pipe and Fittings.
- W. AWWA C651 - Disinfecting Water Mains.
- X. CISPI 301 - Cast Iron Soil Pipe and Fittings for Hubless Cast Iron Sanitary Systems.

- Y. CISPI 310 - Joints for Hubless Cast Iron Sanitary Systems.
- Z. ASSE 1003 Performance Requirements for Water Pressure Reducing Valves for Domestic Water Distribution Systems.

1.04 SUBMITTALS

- A. Submit under provisions of Division One.
- B. Product Data: Provide data on pipe materials, Pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.

1.05 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Division One.
- B. Record actual locations of valves.

1.06 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of Division One.
- B. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.

1.07 QUALITY ASSURANCE

- A. Valves: Manufacturer's name and pressure rating cast or marked on valve body.
- B. Welding Materials and Procedures: Conform to ASME Code and applicable state labor regulations.
- C. Welders Certification: In accordance with ASME Sec 9.
- D. Foreign pipe, fittings or valves are unacceptable.
- E. Piping shall be labeled along entire length indicating size, class, material specification, manufacturers name and country of origin.

1.08 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum 5 years documented experience and must be a domestic manufacturer.

- B. Installer: Company specializing in performing the work of this section with minimum 5 years documented experience.

1.09 REGULATORY REQUIREMENTS

- A. Perform Work in accordance with plumbing and building codes having jurisdiction.
- B. Conform to applicable codes for the provision and installation of all required backflow prevention devices.
- C. Provide certificate of compliance from authority having jurisdiction indicating approval of installation of backflow prevention devices.
- D. No PVC pipe or fittings will be allowed for any areas where pipe is to penetrate a fire rated assembly or to be installed in a return air plenum unless the entire length of all such piping is encased within a minimum 2 hour fire rated enclosure.
- E. Provide pressure regulating valve, maintaining 50 to 55 psi building service pressure, when supply pressure at building is greater than 70 psi.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Division One.
- B. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- C. Provide temporary protective coating on cast iron and steel valves.
- D. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- E. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system. Tape will not be allowed as an acceptable end cover.

1.11 EXTRA MATERIALS

- A. Furnish under provisions of Division One.
- B. Provide two repacking kits for each size valve.

PART 2 - PRODUCTS

2.01 SANITARY SOIL, WASTE AND VENT PIPING, BURIED WITHIN 5 FEET OF BUILDING, BELOW GRADE

- A. PVC Pipe: ASTM D 1785/D 2729 schedule 40; installed per ASTM D 2321.
 - 1. Fittings: PVC, ASTM D 3311/D 2665 drainage pattern, with bell and spigot ends. Furnished by the same manufacturer as pipe or approved equal.
 - 2. Joints: solvent weld with ASTM D 2564 solvent cement, installed per the requirements of ASTM D 2855.

2.02 SANITARY SOIL, WASTE AND VENT PIPING, WITHIN BUILDING, ABOVE GRADE

- A. Cast Iron Pipe: ASTM A 888, hubless, service weight.
 - 1. Fittings: Cast iron, ASTM A 888 drainage pattern.
 - 2. Joints: No hub, ASTM C 564 neoprene gaskets with ASTM C1540 wide bodied stainless steel clamp and solid shield assembly constructed of type 300 series stainless steel. Couplings shall have four clamps for pipe sizes up to and including 4" and shall have six clamps for pipe sizes over 4" through 10". Clamp assemblies shall conform to FM 1680 where required by the administrative authority.

2.03 DOMESTIC WATER PIPING, WITHIN BUILDING, ABOVE GRADE

- A. Copper Tubing: ASTM B 88, Type L, hard drawn.
 - 1. Fittings: ASME B 16.18, cast bronze, or ASTM B 16.22 wrought copper alloy.
 - 2. Joints: ASTM B 32, solder.

2.04 EXCAVATION AND BACKFILL

- A. This section shall govern for all excavation and soil testing for the construction and laying of all sewers, water lines and underground utilities.
- B. Excavation:
 - 1. Excavate trenches for underground piping to the required depth to ensure 3 foot minimum coverage over piping unless noted otherwise. Do not excavate except where required.

2. The bottom of the trench or excavation shall be cut to a uniform grade. Excavation below joints to insure solid and continuous load-bearing support for pipe.
3. Where rock, unstable soils or high water tables are encountered, excavate minimum 6 inches below final grade, fill to pipe grade with cement stabilized, washed bank sand and tamp to existing density.
4. Coordinate alignment of pipe trenches to avoid obstructions. Assure that proposed routing of pipe will not interfere with building foundation before any trenching has begun. Should conflicts occur, contact Architect/Engineer before proceeding.

C. Backfill:

1. Backfill shall not be placed until the work has been inspected, tested and approved. Complete backfill to the surface of natural ground or to the lines and grades indicated on drawings.
2. Fill around drainage pipe using clean bank sand in maximum 6 inch layers to minimum 12 inches above crown of pipe. Care shall be exercised to compact fill material under pipe on both sides to provide support and prevent movement.
3. Provide compacted, cement stabilized sand bed with 6 inch minimum below and 12 inch minimum above drainage pipe placed in unstable or saturated soils and for pipe installed below traffic bearing surfaces.
4. Backfill material 12 inch above pipe to finished surface or grade shall be screened select excavate material free of rock and debris.
5. Compacting Backfill: Place material in uniform layers of 6 inches maximum, loose measure and compact to not less than 95% of maximum soil density as determined by ASTM D-698 Standard Proctor.
6. Restoration: Compact backfill, where trenching or excavation is required in improved areas such as pavements, walks and similar areas, to a condition equal to the adjacent undisturbed earth and restore surface of the area to the condition existing prior to trenching or excavating operation.

2.05 FLANGES, UNIONS AND COUPLINGS

A. Pipe size 2 inches and under:

1. Ferrous pipe: ANSI B16.39, 150 psig malleable iron threaded unions.
2. Copper tube and pipe: 150 psig bronze unions with soldered ends.
3. Ferrous pipe: ANSI B16.5, 150 psig forged steel flanges; screwed neck, 1/16" thick preformed neoprene gaskets.

B. Pipe size 2-1/2 inches and larger:

1. Ferrous pipe: 150 psig forged steel slip-on flanges; weld neck, 1/16" thick preformed neoprene gaskets.
 2. Copper tube and pipe: 150 psig slip-on bronze flanges; 1/16" thick preformed neoprene gaskets.
- C. Dielectric Connections:
1. Pipe size 2 inches and under: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.
 2. Pipe size 2-1/2 inch and larger: flange, connection as above, with water impervious isolation barrier.
- D. Mechanical Couplings:
1. Grooved mechanical pipe couplings, fittings, valves and other grooved components may be used as an option to soldered or braised methods. Fittings shall be cast of bronze for copper tubing systems. All grooved components shall be of one domestic manufacturer, and conform to local code approval and/or as listed by ANSI-B-31, B-31.3M B-31.9, ASME, UL/ULC, FM, IAPMO OR BOCA. Grooved end manufacturer to be ISO-9001 certified. Grooved couplings shall meet the requirements of ASTM F-1476. Manufacturer shall be Victaulic or approved equal.

2.06 GATE VALVES

- A. Manufacturers:
1. Nibco No. T-111 up to 2-1/2"; F-617-O 3" and over.
 2. Other acceptable manufacturers offering equivalent products.
 - a. Crane No. 428 up to 2-1/2"; 465-1/2 3" and over.
 - b. Stockham No. B-100 up to 2-1/2"; G-623 3" and over.
 - c. Grinnell No. 3010 up to 2-1/2"; 6020A 3" and over.
 - d. Kitz No. 24 1/2"-3"; No. 72 Flanged 2"-14"
- B. Up to and including 2-1/2" Inches: Bronze body, bronze trim, rising stem, handwheel, inside screw, solid wedge threaded ends.
- C. Over 3" Inches: Iron body, bronze trim, rising stem, handwheel, OS&Y, solid wedge, flanged ends.
- D. Provide bronze tee or cast iron square nut operator for all valves installed below ground.
1. Valves 2-1/2" and smaller shall be equipped with ASTM B62 solid red bronze tee securely affixed to the valve stem.

2. Valves 3" and larger shall be equipped with a standard 2" square combination nut/socket securely affixed to the valve stem.
3. Provide owner with two extended tee handle operating wrenches for each type of valve head installed.

2.07 BALL VALVES

A. Manufacturers:

1. Nibco No. T-585-70-66
2. Other acceptable manufacturers offering equivalent products.
 - a. Crane No. 9303-B
 - b. Stockham Model S-216BR-1R-T
 - c. Grinnell No. 3700-6
 - d. Kitz No. 68M

B. Up to and including 2 Inches: Bronze 600 PSI two piece body full port, stainless steel ball and stem, Teflon seats and stuffing box ring, lever handle and balancing stops, threaded ends with union.

C. Ball valves used for balancing shall have memory stops.

2.08 SWING CHECK VALVES

A. Manufacturers:

1. Nibco No. T-413-B up to 2-1/2"; F-918 3" and over.
2. Other acceptable manufacturers offering equivalent products.
 - a. Crane No. 37 up to 2-1/2"; 372 3" and over.
 - b. Stockham No. B-319; up to 2-1/2"; G931 3" and over.
 - c. Grinnell No. 3300 up to 2-1/2"; 6300A 3" and over.
 - d. Kitz No. 22 up to 3"; No. 78 2"-10"

B. Up to and including 2-1/2 Inches: Bronze swing disc, screwed ends.

C. Over 2-1/2 Inches: Iron body, bronze trim, swing disc, renewable disc and seat, flanged ends. Include outside lever and adjustable weight where required for quiet operation.

2.09 SPRING LOADED (SILENT) CHECK VALVES

A. Manufacturers:

1. Nibco No. W-910
2. Other acceptable manufacturers offering equivalent products.

a. Grinnell No. 402

B. Iron body, bronze trim, stainless steel spring, renewable composition disc, screwed, wafer, or flanged ends.

2.10 REGULATING VALVES

A. Manufacturers:

- a. Watts No. 223-S up to 2-1/2" size valve.
- b. Watts No. F127W for 3" and Watts No. F127W-WR for 4" size valve.
- c. Other acceptable manufacturers offering equivalent products.

B. Bronze body, teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labeled.

C. Provide and install pressure regulating valves with inlet strainer and union fittings individually or as integral components of regulator.

D. Install pressure regulating valve within building immediately downstream of building shut-off valve and prior to any building service branch connection. Each building service PRV installation shall include an integral permanent bypass assembly with a normally closed bypass throttling globe or ball valve.

2.11 SOLDER

A. 95.5% tin, 4% copper, 0.5% silver.

B. Lead free, antimony free, zinc-free.

C. Silvabrite 100, by Engelhard Corporation or approved equal.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Coordinate and verify excavations under provisions of Division Two.

B. Verify that all excavations are to the required grade, dry, and not over-excavated.

3.02 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale, oil and dirt, on inside and outside, before assembly.

- C. Prepare piping connections to equipment with flanges or unions.
- D. Install, clean bank sand backfill in trench to a minimum of 6 inches below pipe, and to cover all piping a minimum of 12 inches above pipe.

3.03 INSTALLATION

- A. Install all materials in accordance with manufacturer's published instructions.
- B. All exposed sewer and water pipe in toilet rooms or other finished areas of the building shall be chromium plated.
- C. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- D. Route piping in orderly manner, parallel and perpendicular to building column grid lines, unless indicated otherwise on drawings, and maintain gradients.
- E. Install piping to conserve building space and not conflict with other trades or interfere with intended use of space.
- F. Group piping whenever practical at common elevations.
- G. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- H. Provide clearance for installation of insulation and access to valves and fittings. Valves installed beyond reasonable reach shall be provided with chain operator.
- I. Provide access doors where valves and operable fittings are not exposed. Access doors shall be of approved types set in locations pre-approved by submittal to the Architect.
- J. Establish elevations of buried piping outside the building to ensure not less than 2 feet of cover, or maximum depth of frost penetration, which ever is the greater.
- K. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- L. Provide encasement for and support of utility meters in accordance with requirements of utility companies.
- M. Gate valves installed below grade shall be covered with an adjustable cast iron roadway box extended to grade. Cover shall be cast iron with 'water' cast on top and set flush to finished paving or 2" above finished earthen grade. Box shall be

supported from undisturbed soil or concrete base and shall not introduce any stress to piping under all traffic conditions.

- N. Prepare pipe, fittings, supports, and accessories not pre-finished, ready for finish painting.
- O. Excavate in accordance with Division 15.
- P. Backfill in accordance with Division 15.
- Q. Install bell and spigot pipe with bell end upstream.
- R. Maintain uniformity in the installation of piping materials and joining methods. Do not mix materials types.
- S. Install valves with stems upright or horizontal, not inverted.
- T. Solder joints shall be wiped clean at each joint, remove excess metal while molten and flux residue when cooled.
- U. No PVC pipe or fittings will be allowed for any areas where pipe is installed in return air plenum unless the entire length of all such piping is encased within a minimum 2 hour fire rated enclosure.
- V. Provide minimum 18 gauge copper tracer wire laid six inches directly above all underground non-metallic pipe.
- W. Installations of thermoplastic piping systems shall be in strict conformity to the manufacturers published instructions. Under ground drainage pipe installations shall be in conformity to ASTM D 2321.
- X. Installation of solvent cement joints for PVC piping shall be in strict conformity to the requirements outlined in ASTM D 2855.
- Y. Waste nipple from wall to tapped tee shall be schedule 40 threaded galvanized steel pipe or brass or copper with threaded adapter.
- Z. Provide approved PVC slip by cast iron no hub adaptor at each transition from underground PVC piping to above ground cast iron pipe using heavy duty wide bodied no hub couplings as specified elsewhere in this section. Transition shall be made as close as possible to floor for sanitary DWV piping systems and at test tee "minimum 12 in. A.F.F." for storm drainage piping. Support vertical cast iron pipe from floor anchors using riser clamp and galvanized all thread rod as specified in section 15140.

- AA. Provide bracing to prevent axial movement for all storm drainage piping above ground floor. Provide restraints for all drainage piping at all changes in direction and at all diameter changes greater than two pipe sizes. Braces blocks, rodding and other permanent methods as prescribed by cast iron soil pipe institute.
- BB. All grooved components (couplings, fittings, valves, gaskets and specialties) shall be of one domestic manufacturer.
- CC. Grooved manufacturer shall provide on-site training for contractor's field personnel by a factory trained representative in the proper use of grooving tools, application of groove, and product installation. Factory trained representative shall periodically visit the job site and inspect installation. Contractor shall remove and replace any improperly installed products.

3.04 APPLICATION

- A. Install union downstream of all valves at equipment or apparatus connections.
- B. Install male adapters each side of threaded valves in copper piped system. Sweat solder adapters to tube prior to make-up of threaded connections.
- C. Install ball valves for shut-off and to isolate all equipment items, distinct parts of systems, or vertical risers.
- D. Each plumbing fixture shall have a shut-off valve on each hot water and cold water supply line.
- E. Each plumbing water rough-in stub out shall be fitted with a shut off valve.
- F. Install globe, ball or butterfly valves for throttling, bypass, or balancing (manual flow control) services.
- G. Ball valves installed in insulated piping shall be fitted with extended lever operators of sufficient length to raise handle above the insulation jacket material. Where valve is used for throttling service valve handle shall be equipped with adjustable memory stop device.
- H. Provide spring loaded, non-slam, check valves on discharge of water pumps.

3.05 ERECTION TOLERANCES

- A. All drainage lines in the building shall have 1/4 inch to the foot fall where possible and not less than 1/8 inch to the foot fall toward the main sewer. Pipe must be so laid that the slope will be uniform and continuous. Permission shall be secured from the Architect and Engineer before proceeding with any Work where existing conditions prevent the installation at minimum grade specified.

- B. Slope all water piping and arrange to drain at low points. Provide loose key operated, polished chrome, sill cock flush to wall where fixture stop will not suffice for this requirement.

3.06 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Prior to starting work, all domestic water systems shall be complete, thoroughly flushed clean and free of all foreign matter or erection residue.
- B. Ensure PH of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
- C. On building side of the main shut off valve, provide a 3/4" connection through which chlorine can be introduced into the water piping
- D. Inject disinfectant, free chlorine in liquid, powder, tablet or gas form, in sufficient quantity to obtain 50 to 80 mg/L residual free chlorine solution throughout the entire domestic water piping systems.
- E. Bleed water from outlets as required to ensure complete distribution and test for disinfectant residual at a minimum 15 percent of total outlets.
- F. Maintain disinfectant in system for 24 hours.
- G. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
- H. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
- I. Take samples no sooner than 24 hours after flushing, from 5 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

3.07 SERVICE CONNECTIONS

- A. Provide new sanitary and storm sewer services connecting to existing building services or utility lines as shown on the drawings.
- B. Before commencing work, field verify invert elevations required for sewer connections, confirm inverts and ensure that these can be properly connected with slope for drainage and cover as required.
- C. Provide new domestic water service connecting to existing building services or utility lines as shown on plans. Assure connections are in compliance with requirements of the jurisdiction having authority.

- D. Extension of services to the building shall be fabricated from the same materials as the utility service lines or those materials specified herein.
- E. Should points of connection vary from those indicated on the drawings contractor shall properly allow for this in the actual connections field fabricated.

3.08 RODDING SEWERS

- A. All sanitary soil and waste lines, both in the building and out, shall be rodded out after completion of the installation.
- B. This Work shall be done, as part of the contract, to make certain that all lines are clear, and any obstruction that may be discovered shall be removed immediately. Rodding shall be accomplished by utilizing a rotary cutter, which shall be full size of pipe being cleaned.

3.09 TESTING OF PLUMBING PIPING SYSTEMS

- A. During the progress of the work and upon completion, tests shall be made as specified herein and as required by Authorities Having Jurisdiction, including Inspectors, Owner or Architect. The Architect or duly authorized Construction Inspector shall be notified in writing at least 2 working days prior to each test or other Specification requirement which requires action on the part of the Construction Inspector.
- B. Tests shall be conducted as part of this work and shall include all necessary instruments, equipment, apparatus, and service as required to perform the tests with qualified personnel. Submit proposed test procedures, recording forms, and test equipment for approval prior to the execution of testing.
- C. Tests shall be performed before piping of various systems have been covered or furred-in. For insulated piping systems testing shall be accomplished prior to the application of insulation.
- D. All piping systems shall be tested and proved absolutely tight for a period of not less than 24 hours. Tests shall be witnessed by the Architect or an authorized representative and pronounced satisfactory before pressure is removed or any water drawn off.
- E. Leaks, damage or defects discovered or resulting from test shall be repaired or replaced to a like new condition. Leaking pipe joints, or defective pipe, shall be removed and replaced with acceptable materials. Test shall be repeated after repairs are completed and shall continue until such time as the entire test period expires without the discovery of any leaks.

- F. Wherever conditions permit, each piping system shall thereafter be subjected to its normal operating pressure and temperature for a period of no less than five 5 days. During that period, it shall be kept under the most careful observation. The piping systems must demonstrate the propriety of their installation by remaining absolutely tight during this period.
- G. Domestic Water:
1. .Pressure test at one and one half times the normal working pressure or 125 psig, which ever is the greater, for 24 hours.
- H. Sanitary Soil, Waste and Vents and Storm Sewer:
1. After the rough-in soil, waste and vent and other parts of the sanitary sewer including branch laterals have been set from the lowest level, at point of connection to existing utility lines, to above the floor line, all outlets shall be temporarily plugged or capped, except as are required for testing as described herein. Ground work shall not permit the backfill of trenches to cover any joints until the completion of testing. Back fill shall be limited to mid sections of full joints of piping only. For pipe in ground the piping shall be readied as described herein and filled with water to a verifiable and visible level to 10' above the lowest portions of the system being tested.
 2. On multi-level buildings only one floor level shall be tested at a time. Each floor shall be tested from a level below the structure of the floor, or the outlet of the building in the case of the lowest level, to a level of 12 inches above the floor immediately above the floor being tested, or the top of the highest vent in the case of the highest building level. The pipes for the level being tested shall be filled with water to a verifiable and visible level as described above and be allowed to remain so for 24 hours. If after 24 hours the level of the water has been lowered by leakage, the leaks must be found and stopped, and the water level shall again be raised to the level described, and the test repeated until, after a 24 hour retention period, there shall be no perceptible lowering of the water level in the system being tested.
 3. Should the completion of these tests leave any reasonable question or doubt of the integrity of the installation, additional tests including peppermint smoke, or other measures shall be performed to demonstrate the reliability of these systems to the complete satisfaction of the Owner's duly authorized representative. Such tests shall be conducted and completed before any joints in plumbing are concealed or made inaccessible.

3.10 COMPLETE FUNCTIONING OF WORK

- A. All work fairly implied as essential to the complete functioning of the systems shown on the Drawings and Specification shall be completed as part of the work of this Division unless specifically stated otherwise. It is the intention of the Drawings and Specification to establish the type and function of systems but not to set forth each item essential to the functioning of any system. In case of doubt as to the work intended or in the event of amplification or clarification thereof, the Contractor shall call upon the Architect for Supplementary Instructions and Drawings, etc.

END OF SECTION

SECTION 15440

PLUMBING FIXTURES

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.
- B. The Basic Materials and Methods, Section 15050, are included as a part of this Section as though written in full in this document.

1.02 SCOPE

Scope of the Work shall include the furnishing and complete installation of the equipment covered by this Section, with all auxiliaries, ready for owner's use.

- A. **WORK INCLUDED:** Include the following Work in addition to items normally part of this Section:
 - 1. Plumbing fixtures.
 - 2. Drains and cleanouts.
- B. **WORK SPECIFIED ELSEWHERE:**
 - 1. Piping systems.
 - 2. Pipe valves and fittings.
 - 3. Plumbing systems testing.

1.03 WARRANTY

- A. Warrant the Work specified herein for one year against becoming unserviceable or causing an objectionable appearance resulting from either defective or nonconforming materials and workmanship.
- B. Defects shall include, but not be limited to, the following:
 - 1. Noisy operation.
 - 2. Noticeable deterioration of finish.
 - 3. Leakage of water.

1.04 SUBMITTALS

- A. **SHOP DRAWINGS:** Indicate size, material, and finish. Show locations and

installation procedures. Include details of joints, attachments, and clearances.

- B. **PRODUCT DATA:** Submit schedules, charts, literature, and illustrations to indicate the performance, fabrication procedures, product variations, and accessories.
- C. **OPERATION AND MAINTENANCE INSTRUCTIONS:** Provide pre-printed operating and maintenance instructions for each item specified. Instruct and demonstrate the proper operation and maintenance to the Owner's designated representative.

1.05 DELIVERY AND STORAGE

- A. **DELIVERY:** Deliver clearly labeled, undamaged materials in the manufacturers' unopened containers.
- B. **TIMING AND COORDINATION:** Deliver materials to allow for minimum storage time at the project site. Coordinate delivery with the scheduled time of installation.
- C. **STORAGE:** Store materials in a clean, dry location, protected from weather and abuse.

1.06 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings.
- B. Confirm and field coordinate that millwork is constructed with adequate provision for the installation of counter top lavatories and sinks.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. **PLUMBING FIXTURES:**
 - 1. **GENERAL:** Provide plumbing fixtures as specified on drawings. The approved equal products manufacturers are as follows:
 - a. Water closet, urinals, lavatories, bath tubs and showers: American Standard, Kohler, Eljer.
 - b. Stainless steel sinks: Elkay, Just and Moen.
 - c. Faucets: Chicago, T&S Brass, Zurn
 - d. Faucets: Moen Commercial, Delta Commercial
 - e. Flush Valves: Sloan, Zurn
 - 2. **CHAIR CARRIERS:** ANSI/ASME A112.6.1.; Adjustable cast iron frame,

integral drain hub and vent, adjustable spud, lugs for floor and wall attachment, threaded fixture studs with nuts and washers. As manufactured by Zurn, J. R. Smith, Josam or Wade.

3. URINAL WALL SUPPORTS: ANSI/ASME A112.6.1; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded fixture studs for fixture hanger, bearing studs. As manufactured by Zurn, J. R. Smith, Josam or Wade.
4. TRAPS, STOPS AND RISERS: Heavy pattern as manufactured by McGuire, Chicago or Zurn.

B. CLEANOUTS:

1. GENERAL: Provide cleanouts as shown on Drawings and as required by the city building code.
2. ACCEPTABLE MANUFACTURERS: Zurn, J. R. Smith, Mifab, Josam and Wade.
3. TYPES:
 - a. FINISHED FLOOR CLEANOUTS: Provide cast iron, adjustable floor level assembly with round nickel bronze top and gasket cover.
 - b. RESILIENT OR TILE FINISHED FLOOR CLEANOUTS: Provide cast iron, adjustable assembly with round nickel-bronze top with gasketed water tight cover and depressed top to receive flooring finish material.
 - c. DRY WALL CLEANOUTS: Provide cast iron tee and counter sink bronze plug with square nickel bronze frame and stainless steel cover.
 - d. Provide membrane clamp rings for slab on grade cleanouts.
 - e. All cleanouts shall have tapered bronze plugs.
 - f. All cleanouts outside of building on grade shall be set in a 18" x 18" x 4" thick concrete pad.

PART 3 - EXECUTION

3.01 PREPARATION

- A. EXAMINATION OF CONDITIONS: Examine conditions affecting this Work. Report unsatisfactory conditions to the proper authority and do not proceed until those conditions have been corrected. Commencing Work implies acceptance of existing conditions as satisfactory to the outcome of this Work.

3.02 INSTALLATION

- A. Install fixtures in locations and heights as shown on Drawings or as directed by the Architect.
- B. Install materials plumb, level, securely, and in accordance with manufacturer's

recommendations.

- C. All rough-in pipe openings, for final connections with all supply waste soil and vent systems shall be closed with caps or plugs during early stages of construction and installation. Tape shall not be considered sufficient protection.
- D. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.
- E. Provide gate valves in piping serving batteries of fixtures. Label stops "Hot" and "Cold." Valves to be located above accessible ceiling. If ceiling are not accessible, provide access panels of adequate size to make valves fully accessible.
- F. Plumbing fixtures shall be supported by a concealed chair carrier where required to properly support the fixture specified. All carriers to be securely mounted bolted and checked prior to concealment.
- G. Caulk around fixtures with best grade white silicone caulking. Do not use grout.
- H. All handles on supply and drainage fittings or other brass items shall be properly lined up and adjusted. Fittings shall not be left in any haphazard manner.
- I. All fixtures shall have individual chrome plated loose key cutoff stops on supply lines. Where same are not specified as a part of the fixture trim, they shall be installed as close to fixtures as possible in the hot and cold water supply.
- J. Install each fixture with trap, easily removable for servicing and cleaning.
- K. Provide chrome plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.
- L. Hot and cold water riser air chambers: Provide air chambers for hot and/or cold water riser located at the rough-in tee at all fixtures.

The air chamber shall be of the same materials and the next larger diameter than the required rough-in supply pipe and a minimum of 24" tall.

The contractor may install water hammer arrestors in lieu of air chambers. Water hammer arrestors shall be PDI Certified and sized and placed as recommended by manufacture. Provide an accessible isolation valve and proper access to arrestor for replacement.

3.03 INTERFACE WITH OTHER PRODUCTS

- A. Review millwork shop drawings. Confirm location and size of fixtures and openings

before rough-in and installation.

3.04 ADJUSTING

- A. Adjust work under provisions of Division One.
- B. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.05 CLEANING

- A. Clean work under provisions of Division One.
- B. At completion clean plumbing fixtures and equipment.

3.06 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Division One.
- B. Do not permit use of fixtures.

3.07 ADA ACCESSIBLE FIXTURES

- A. Install fixtures to heights, indicated on architectural drawings.
- B. Handicapped fixtures shall be installed to required heights, shall be of types suitable for, and supplied with controls properly installed, to comply with requirements as directed by ADA Accessibility of Federal Registry, Part III, Department of Justice 28 CFR 36 and comply with all state and local ADA Code requirements.
- C. Exposed accessible sink or lavatory p-trap and angle valve assemblies shall be insulated with the fully molded, Truebro, Handi Lav-guard insulation kit. Provide the proper model for fixtures specified. All kits shall be White or as selected by Architect.
- D. Wall mounted drinking fountains and coolers which protrude into passages or corridor space, whether single or paired with adjacent accessible fixture, shall be supplied with skirt or apron to lower the underside clearance of non-accessible fixture equal to that required for accessible fixture.

END OF SECTION

SECTION 15881

AIR DISTRIBUTION DEVICES

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Ceiling air diffusers.
- B. Wall registers and grilles.
- C. Other air devices indicated on drawings and schedules.

1.02 RELATED SECTIONS

- A. Section 15050 – Basic Materials and Methods
- B. Section 15890 – Metal Ductwork
- C. Section 15910 – Ductwork Accessories
- D. Section 15990 – Testing, Adjusting and Balancing

1.03 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of air distribution devices of types and capacities required, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. Codes and Standards:
 - 1. ARI Compliance: Test and rate air distribution devices in accordance with ARI 650 "Standard for Air Outlets and Inlets".
 - 2. ASHRAE Compliance: Test and rate air distribution devices in accordance with ASHRAE 70 "Method of Testing for Rating the Air Flow Performance of Outlets and Inlets".
 - 3. AMCA Compliance: Test and rate louvers in accordance with AMCA 500 "Test Method for Louvers, Dampers and Shutters".
 - 4. AMCA Seal: Provide louvers bearing AMCA Certified Rating Seal.
 - 5. NFPA Compliance: Install air distribution devices in accordance with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilating Systems".

1.04 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data for air distribution devices including the following:
 - 1. Schedule of air distribution devices indicating drawing designation, room location, number furnished, model number, size, and accessories furnished.
 - 2. Data sheet for each type of air distribution devices, and accessory furnished; indicating construction, finish, and mounting details.
 - 3. Performance data for each type of air distribution devices furnished, including aspiration ability, temperature and velocity traverses; throw and drop; and noise criteria ratings. Indicate selections on data.
- B. Shop Drawings: Submit manufacturer's assembly-type shop drawing for each type of air distribution devices, indicating materials and methods of assembly of components.
- C. Maintenance Data: Submit maintenance data, including cleaning instructions for finishes, and spare parts lists. Include this data, product data, and shop drawings in maintenance manuals; in accordance with requirements of Division 1.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver air distribution devices wrapped in factory-fabricated fiber-board type containers. Identify on outside of container type of outlet or inlet and location to be installed. Avoid crushing or bending and prevent dirt and debris from entering and settling in devices.
- B. Store air distribution devices in original cartons and protect from weather and construction work traffic. Where possible, store indoors; when necessary to store outdoors, store above grade and enclose with waterproof wrapping.

1.06 WARRANTY

- A. Warrant the installation of the Work specified herein for one year against becoming unserviceable or causing an objectionable appearance resulting from defective or nonconforming workmanship.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Titus Company

- B. Metalaire Industries, Inc.
- C. Nailor Industries
- D. Price
- E. Substitutions under provisions of Division One.

2.02 GENERAL DESCRIPTION

- A. Unless otherwise indicated, provide manufacturer's standard air devices when shown of size, shape, capacity, type and accessories indicated on drawings and schedules, constructed of materials and components as indicated and as required for complete installation and proper air distribution.
- B. Provide air devices that have, as minimum, temperature and velocity traverses, throw and drop, and noise criteria ratings for each size device and listed in manufacturer's current data.
- C. Unless noted otherwise on drawings, the finish shall be #26 white. The finish shall be an anodic acrylic paint, baked at 315°F for 30 minutes. The pencil hardness must be HB to H. The paint must pass a 100 hour ASTM D117 Corrosive Environments Salt Spray Test without creepage, blistering, or deterioration of film. The paint must pass a 250 hour ASTM-870 Water Immersion Test. The paint must also pass the ASTM D-2794 Reverse Impact Cracking Test with a 50 inch pound force applied.
- D. Provide air device with border styles that are compatible with adjacent ceiling or wall system, and that are specially manufactured to fit into the wall construction or ceiling module with accurate fit and adequate support. Refer to architectural construction drawings and specifications for types of wall construction and ceiling systems.
- E. Provide integral volume damper with roll formed steel blades where indicated on drawings or schedules. Dampers shall be opposed blade design with a screw driver slot or a concealed lever operator for adjustment through the face of the air device.
- F. Air devices designated for fire rated systems shall be pre-assembled with UL classified radiation damper and thermal blanket. Fire rated air devices shall be shipped completely assembled; one assembly per carton, Each assembly shall be enclosed in plastic shrink wrap with installation instructions.

PART 3 – EXECUTION

- 3.01 All interior surfaces of all air devices shall be painted flat black.

- 3.02 See floor plans for type, neck size and CFM of air for all air distribution devices.
- 3.03 Install all air distribution devices as detailed on plans and in accordance with manufacturer's recommendations.

END OF SECTION

SECTION 15890

METAL DUCTWORK

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Low pressure ductwork.
- B. Duct cleaning

1.02 RELATED SECTIONS

Section 09900 - Painting: Weld priming, weather resistant, paint or coating.

- A. Section 15050 - Basic Material and Methods.
- B. Section 15290 - Duct Insulation.
- C. Section 15910 - Ductwork Accessories.
- D. Section 15881 - Air Distribution Devices.
- E. Section 15990 - Testing, Adjusting and Balancing.

1.03 QUALITY ASSURANCE

- A. **Manufacturer's Qualifications:** Firms regularly engaged in manufacture of metal ductwork products of types, materials and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. **Installer's Qualifications:** Firms with least 3 years of successful installation experience on projects with metal ductwork systems similar to that required for project.
- C. **Codes and Standards:**
 - 1. **SMACNA Standards:** Comply with latest SMACNA's "HVAC Duct Construction Standards, Metal and Flexible" for fabrication and installation of metal ductwork.
 - 2. **ASHRAE Standards:** Comply with ASHRAE Handbook, Equipment Volume, Chapter 1 "Duct Construction", for fabrication and installation of metal ductwork.

3. NFPA Compliance: Comply with NFPA 90A “Standard for the Installation of Air Conditioning and Ventilating Systems”, NFPA 90B “Standard for the Installation of Warm Air Heating and Air Conditioning Systems”, and NFPA 96 Standard.
4. IECC 2003: Comply with 2003 International Energy Conservation Code.

1.04 GENERAL DESCRIPTION

- A. Extent of metal ductwork is indicated on drawings and in schedules, and by requirements of this section.

1.05 SUBMITTALS

- A. Submit shop drawings, duct fabrication standards and product data under provisions of Division One.
- B. Indicate duct fittings, particulars such as gauges, sizes, welds, and configuration prior to start of work.
- C. The contract documents are schematic in nature and are to be used only for design intent. The contractor shall prepare sheet metal shop drawings, fully detailed and drawn to scale, indicating all structural conditions, all plumbing pipe and light fixture coordination, and all offsets and transitions as required to permit the duct to fit in the space allocated and built. All duct revisions required as a result of the contractor not preparing fully detailed shop drawings will be performed at no additional cost.

1.06 DEFINITIONS

- A. Duct Sizes: Inside clear dimensions. For lined ducts, maintain indicated clear size inside lining. Where offsets or transitions are required, the duct shall be the equivalent size based on constant friction rate.
- B. Low Pressure: Low pressure ductwork shall be rated for an operating pressure of 2”. Low pressure ductwork shall be defined as all return, exhaust, and outside air ducts, all supply ductwork associated with constant volume air handling units with a scheduled external static pressure of less than 2”, and all supply ductwork downstream of terminal units in variable volume systems.
- C. Medium Pressure: Medium pressure ductwork shall be rated for an operating pressure of 4”. Medium pressure ductwork shall be defined as all supply ductwork extending from variable volume air handling units to terminal units in variable volume systems with air handling units having a scheduled external static pressure of less than 4”. The supply ductwork of constant volume air handling

units having a scheduled external static pressure greater than 2” and less than 4” shall be rated for medium pressure.

- D. High Pressure: High pressure ductwork shall be rated for an operating pressure of 6”, or the scheduled external pressure of the equipment it is connected to, whichever is greater. The supply ductwork of air handling units having a scheduled external static pressure greater than 4” shall be high pressure.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protection: Protect shop-fabricated and factory-fabricated ductwork, accessories and purchased products from damage during shipping, storage and handling. Prevent end damage and prevent dirt and moisture from entering ducts and fittings, use sheet metal end caps on any lined duct exposed to the weather.
- B. Storage: Where possible, store ductwork inside and protect from weather. Where necessary to store outside, store above grade and enclose with waterproof wrapping.

PART 2 - PRODUCTS

2.01 DUCTWORK MATERIALS

- A. Exposed Ductwork Materials: Where ductwork is indicated to be exposed to view in occupied spaces, provide materials which are free from visual imperfections including pitting, seam marks, roller marks, stains and discolorations, and other imperfections, including those which would impair painting.
- B. Sheet Metal.: Except as otherwise indicated, fabricate ductwork from galvanized sheet steel complying with ASTM A 924, lockforming quality, with G 90 zinc coating in accordance with ASTM A 563; and mill phosphatized for exposed locations.
- C. Stainless Steel Sheet: Where indicated, provide stainless steel complying with ASTM A167; Type 316; with No. 4 finish where exposed to view in occupied spaces, No. 1 finish elsewhere. Protect finished surfaces with mill-applied adhesive protective paper, maintained through fabrication and installation.
- D. Aluminum Sheet: Where indicated, provide aluminum sheet complying with ASTM B 209, Alloy 3003, Temper H14.

2.02 MISCELLANEOUS DUCTWORK MATERIALS

- A. General: Non combustible and conforming to UL 181, Class 1 air duct materials.

- B. Flexible Ducts: Flexmaster U.S.A., Inc. Type 3M or approved equal, corrosive resistant galvanized steel formed and mechanically locked to inner fabric with 1” thick insulation when flexible ducts are located in conditioned spaces and with R-5 insulation when located in unconditioned spaces. Flexible duct shall have reinforced metalized outer jacket comply with UL 181, Class 1 air duct.
- C. Sealants: Hard-Cast “iron grip” or approved equal, non-hardening, water resistant, fire resistive and shall not be a solvent curing product. Sealants shall be compatible with mating materials, liquid used alone or with tape or heavy mastic.
- D. Ductwork Support Materials: Except as otherwise indicated, provide hot-dipped galvanized steel fasteners, anchors, rods, straps, trim and angles for support of ductwork.
 - 1. For exposed stainless steel ductwork, provide matching stainless steel support materials.
 - 2. For aluminum ductwork, provide aluminum support materials.

2.03 LOW PRESSURE DUCTWORK

- A. Fabricate and support in accordance with latest SMACNA Duct Construction Standards and ASHRAE handbooks, except as indicated. Provide duct material, gauges, reinforcing, and sealing for operating pressures indicated.
- B. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts. No variation of duct configuration or sizes permitted except by approved shop drawings. Obtain engineer’s approval prior to using round duct in lieu of rectangular duct.
- C. Construct T’s, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows are used, provide airfoil-turning vanes. Where acoustical lining is indicated, provide turning vanes of perforated metal with glass fiber insulation.
- D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible. Divergence upstream of equipment shall not exceed 30 degrees; convergence downstream shall not exceed 45 degrees.
- E. Use crimp joints with bead for joining round duct sizes 6 inch smaller with crimp in direction of airflow.
- F. Use double nuts and lock washers on threaded rod supports.

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

- A. Obtain manufacturer's inspection and acceptance of fabrication and installation of ductwork at beginning of installation.
- B. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pitot tube openings where required for testing of systems, complete with metal cap with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.
- C. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
- D. Connect terminal units to medium or high pressure ducts with four feet maximum length of flexible duct. Do not use flexible duct to change direction.
- E. Connect diffusers or troffer boots to low pressure ducts with 6 feet maximum, 4 feet minimum, length of flexible duct. Hold in place with strap or clamp.
- F. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- G. The interior surface of all ductwork shall be smooth. No sheet metal parts, tabs, angles, or anything else may project into the ducts for any reason, except as specified to be so. All seams and joints shall be external.
- H. All ductwork located exposed on roof shall be "crowned" to prevent water from ponding. Ref: Insulation for additional requirements.
- I. Where ducts pass through floors, provide structural angles for duct support. Where ducts pass through walls in exposed areas, install suitable sheet metal escutcheons as closers.
- J. All angles shall be carried around all four sides of the duct or group of ducts. Angles shall overlap corners and be welded or riveted.
- K. All ductwork shall be fabricated in a manner to prevent the seams or joints being cut for the installation of grilles, registers, or ceiling outlets.
- L. All duct hangers shall be attached to building structure. Cutting slots in roof or floor decking for hanger straps to be cast in concrete is not acceptable.

3.02 INSTALLATION OF FLEXIBLE DUCTS

- A. Maximum Length: For any duct run using flexible ductwork, do not exceed 6'-0" extended length.
- B. Installation: Install in accordance with Section III of SMACNA's, "HVAC Duct Construction Standards, Metal and Flexible".

3.03 DUCTWORK APPLICATION SCHEDULE

AIR SYSTEM	MATERIAL
Low Pressure Supply	Steel, Aluminum
Return and Relief	Steel, Aluminum
General Exhaust	Steel, Aluminum
Outside Air Intake	Steel

3.04 DUCTWORK HANGERS AND SUPPORTS

- A. All ductwork shall be properly suspended or supported from the building structure. Hangers shall be galvanized steel straps or hot-dipped galvanized rod with threads pointed after installation. Strap hanger shall be attached to the bottom of the ductwork, provide a minimum of two screws one at the bottom and one in the side of each strap on metal ductwork. The spacing, size and installation of hangers shall be in accordance with the recommendations of the latest SMACNA edition.
- B. All duct risers shall be supported by angles or channels secured to the sides of the ducts at each floor with sheet metal screws or rivets. The floor supports may also be secured to ducts by rods, angles or flat bar to the duct joint or reinforcing. Structural steel supports for duct risers shall be provided under this Division.

3.05 AIR DUCT LEAKAGE: (From SMACNA Duct Standards Latest Edition) Test all ductwork (designed to handle over 1000 CFM) as follows:

- A. Test apparatus

The test apparatus shall consist of:

1. A source of high pressure air--a portable rotary blower or a tank type vacuum cleaner.
2. A flow measuring device consisting of straightening vanes and an orifice plate mounted in a straight tube with properly located pressure taps. Each orifice assembly shall be accurately calibrated with its own calibration

curve. Pressure and flow readings shall be taken with U-tube manometers.

B. Test Procedures

1. Test for audible leaks as follows:
2. Close off and seal all openings in the duct section to be tested. Connect the test apparatus to the duct by means of a section of flexible duct.
 - a. Start the blower with its control damper closed.
 - b. Gradually open the inlet damper until the duct pressure reaches 1.5 times the standard designed duct operating pressure.
 - c. Survey all joint for audible leaks. Mark each leak and repair after shutting down blower. Do not apply a retest until sealants have set.
3. After all audible leaks have been sealed, the remaining leakage should be measured with the orifice section of the test apparatus as follows:
 - a. Start blower and open damper until pressure in duct reaches 50% in excess of designed duct operating pressure.
 - b. Read the pressure differential across the orifice on manometer No. 2. If there is no leakage, the pressure differential will be zero.
 - c. Total allowable leakage shall not exceed one (1) percent of the total system design air flow rate. When partial sections of the duct system are tested, the summation of the leakage for all sections shall not exceed the total allowable leakage.
 - d. Even though a system may pass the measured leakage test, a concentration of leakage at one point may result in a noisy leak which, must be corrected.
4. Test Witness
 - a. Air duct leakage test shall be witnessed by Owner/Engineer.
 - b. The Architect or duly authorized construction inspector shall be notified in writing at least 2 working days prior to each test.

3.06 DUCT SYSTEM CLEANING

- A. Duct system cleaning shall be performed in accordance with the current published standards of ASHRAE and NADCA.
- B. Duct system cleaning method used shall incorporate the use of vacuum collection devices that are operated continuously during cleaning. A vacuum device shall be connected to the downstream end of the section being cleaned through a predetermined opening. The vacuum collection device must be of sufficient power to render all areas being cleaned under negative pressure, such that containment of debris and the protection of the indoor environment is assured.

- C. All vacuum devices exhausting air inside the building shall be equipped with HEPA filters (minimum efficiency), including hand-held vacuums and wet-vacuums.
- D. All vacuum devices exhausting air outside the facility shall be equipped with Particulate Collection including adequate filtration to contain debris removed from the HVAC system. Such devices shall exhaust in a manner that will not allow contaminants to re-enter the facility. Release of debris outdoors must not violate any outdoor environmental standards, codes or regulations.
- E. Fibrous glass thermal or acoustical insulation elements present in any equipment or ductwork shall be thoroughly cleaned with HEPA vacuuming equipment, while the HVAC system is under constant negative pressure, and not permitted to get wet in accordance with applicable NADCA and NAIMA standards and recommendations.
- F. Duct cleaning method used shall not damage the integrity of the ductwork, nor damage porous surface materials such as liners inside the ductwork or system components.
- G. Replace the fiberglass material if there is any evidence of damage, deterioration, delamination, friable material, mold or fungus growth, or moisture such that fibrous glass materials cannot be restored by cleaning or resurfacing with an acceptable insulation repair coating.
- H. Clean external surfaces of foreign substances which might cause corrosive deterioration of metal or, where ductwork is to be painted, might interfere with painting or cause paint deterioration.
- I. Strip protective paper from stainless ductwork surfaces, and repair finish wherever it has been damaged.
- J. Temporary Closure: At ends of ducts which are not connected to equipment or air distribution devices at time of ductwork installation, provide temporary closure of polyethylene film or other covering which will prevent entrance of dust and debris until time connections are to be completed.
- K. Cleaning Report: Contractor shall provide a report to the Owner indicating the completion of duct cleaning per specification and areas of the duct system found to be damaged and/or in need of repair.

3.07 DUCT JOINTS AND SEAMS

- A. Seal all non-welded duct joints with duct sealant as indicated.

END OF SECTION

Section 15890

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SECTION 15910

DUCTWORK ACCESSORIES

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Volume control dampers.
- B. Round Duct Taps.
- C. Combination fire and smoke dampers.
- D. Back draft dampers.
- E. Air turning devices.
- F. Flexible duct connections.
- G. Duct access doors.
- H. Duct test holes.

1.02 RELATED WORK

- A. Section 15890 - Ductwork.

1.03 REFERENCES

- A. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.
- B. SMACNA - Low Pressure Duct Construction Standards.
- C. UL 33 - Heat Responsive Links for Fire-Protection Service.
- D. UL 555 - Fire Dampers and Ceiling Dampers.

1.04 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Division One.
- B. Provide shop drawings for shop fabricated assemblies indicated, including volume control dampers duct access doors duct test holes. Provide product data for hardware used.

- C. Submit manufacturer's installation instructions under provisions of Section 01300, for fire dampers and combination fire and smoke dampers.

PART 2 PRODUCTS

2.01 VOLUME CONTROL DAMPERS

- A. Fabricate in accordance with SMACNA Low Pressure Duct Construction Standards, and as indicated.
- B. Fabricate splitter dampers of material same gauge as duct to 24 inches size in either direction, and two gauges heavier for sizes over 24 inches.
- C. Fabricate splitter dampers of double thickness sheet metal to streamline shape. Secure blade with continuous hinge or rod. Operate with minimum 1/2 inch diameter rod in self aligning, universal joint, action flanged bushing, with set screw.
- D. Fabricate single blade dampers for duct sizes to 9-1/2 x 24 inch.
- E. Fabricate multi-blade damper of opposed blade pattern with maximum blade sizes 12 x 72 inch.
 - 1. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
 - 2. On outside air, return air, and all other dampers required to be low leakage type, provide galvanized blades and frames, seven inches wide maximum, with replaceable vinyl, EPDM, silicone rubber seals on blade edges and stainless steel side seals. Provide blades in a double sheet corrugated type construction for extra strength. Provide hat channel shape frames for strength and blade linkage enclosure to keep linkage out of the air stream. Construction leakage not to exceed 1/2%, based on 2,000 fpm and 4 inch static pressure.
- F. Except in round ductwork 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon or sintered bronze bearings.
- G. Provide locking, indicating quadrant regulators on single and multi-blade dampers. Where rod lengths exceed 30 inches provide regulator at both ends.
- H. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.

2.02 ROUND DUCT TAPS

- A. Taps to trunk duct for round flexible duct shall be spin-in fitting with locking quadrant butterfly damper, model no. FLD-B03 by Flexmaster or approved equal.

2.03 ACCEPTABLE MANUFACTURERS - FIRE DAMPERS AND COMBINATION FIRE AND SMOKE DAMPERS

- A. Greenheck
- B. Louvers and Dampers Inc.
- C. Ruskin.
- D. Nailor Industries.
- E. Pottorff

2.04 COMBINATION FIRE AND SMOKE DAMPERS

- A. Fabricate in accordance with NFPA 90A and UL 555, and as indicated.
- B. Provide factory sleeve for each damper. Install damper operator on exterior of sleeve and link to damper operating shaft.
- C. Fabricate with multiple blades with 16 gauge galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, stainless steel jamb seals, 1/8 x 1/2 inch plated steel concealed linkage, stainless steel closure spring, blade stops, and lock, and 1/2 inch actuator shaft.
 - 1. Operators shall be spring return electric type suitable to operate on 120 V AC, 60 cycle.
 - 2. Operators shall be UL listed and labeled.

2.05 ACCEPTABLE MANUFACTURERS - BACKDRAFT DAMPERS

- A. Greenheck
- B. American Warming and Vent.
- C. Louvers and Dampers Inc.
- D. Ruskin.
- E. Substitutions: Under provisions of Division One.

2.06 BACKDRAFT DAMPERS.

- A. Gravity back draft dampers, size 18 x 18 inches or smaller, furnished with air moving equipment, may be air moving equipment manufacturers standard construction.
- B. Fabricate multi-blade, parallel action gravity balanced back draft dampers of 16 gauge galvanized steel, or extruded aluminum, with blades of maximum 6 inch width, with felt or flexible vinyl sealed edges, linked together in rattle-free manner with 90 degree stop, steel ball bearings, and plated steel pivot pin; adjustment device to permit setting for varying differential static pressure.

2.07 ACCEPTABLE MANUFACTURERS - AIR TURNING DEVICES

- A. Young Regulator.
- B. Titus.
- C. Tuttle and Bailey.
- D. Substitutions: Under provisions of Division One.

2.08 AIR TURNING DEVICES

- A. On duct sizes less than 12 x 12, multi-blade device with blades aligned in short dimension; steel or aluminum construction; with individually adjustable blades, mounting straps.
- B. Multi-blade device with radius blades attached to pivoting frame and bracket, steel or aluminum construction, with worm drive mechanism with 18 inch long removable key operator.

2.09 ACCEPTABLE MANUFACTURERS - FLEXIBLE DUCT CONNECTIONS

- A. Metaledge.
- B. Ventglass.
- C. Substitutions: Under provisions of Division One.

2.10 ACCEPTABLE MANUFACTURERS - DUCT ACCESS DOORS

- A. Greenheck

- B. American Warming and Vent.
- C. Ruskin.
- D. Titus.
- E. Substitutions: Under provisions of Division One.

2.11 DUCT ACCESS DOORS

- A. Fabricate in accordance with SMACNA Low Pressure Duct Construction Standards and as indicated.
- B. Review locations prior to fabrication.
- C. Fabricate rigid and close-fitting doors of galvanized steel with sealing gaskets and quick fastening locking devices. For insulated ductwork, install minimum one inch thick insulation with sheet metal cover. Insulation shall be replaceable without field cutting or patching.
- D. Access doors smaller than 12 inches square may be secured with sash locks.
- E. Provide two hinges and two sash locks for sizes up to 18 inches square, three hinges and two compression latches with outside and inside handles for sizes up to 24 x 48 inches. Provide an additional hinge for larger sizes.
- F. Access doors with sheet metal screw fasteners are not acceptable.

2.12 DUCT TEST HOLES

- A. Cut or drill temporary test holes in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.
- B. Permanent test holes shall be factory fabricated, air tight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.

PART 3 EXECUTIONS

3.01 INSTALLATION

- A. Install accessories in accordance with manufacturer's instructions.
- B. Balancing Dampers
 - 1. Provide at points on low pressure supply, return, and exhaust systems

- where branches are taken from larger ducts and as required for air balancing. Use splitter dampers only where indicated.
2. All regulators mounted on externally insulated ductwork shall have 16 gauge elevated platforms at least 1/8 inch higher than the thickness of the insulation. Damper shaft shall have Ventlock No. 607 bearing mounted on ductwork within elevated platform. If duct is inaccessible the operating handle shall be extended and the regulator installed on the face of the wall or ceiling. Where regulators are exposed in finished parts of the building, they shall be flush type, Ventlock No. 666. All regulators shall be manufactured by Ventlock, or approved equal.
 3. All dampers in lined ductwork shall have bushing to prevent damper damage to liner.
- C. Provide fire dampers at locations indicated, where ducts and outlets pass through fire rated components, and where required by authorities having jurisdiction. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.
- D. Demonstrate re-setting of fire dampers to authorities having jurisdiction and Owner's representative.
- E. Provide back draft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.
- F. Provide flexible duct connections immediately adjacent to equipment in ducts associated with fans and motorized equipment. Provide at least one inch slack at all flexible duct connections.
- G. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, every 70 linear feet, at each change of direction, both sides of turning vanes and elsewhere as indicated. Provide minimum 8 x 8 inch size for hand access, 18 x 18 inch size for shoulder access, and as indicated. Locate doors so that minimum number possible is used.
- H. Provide duct test holes where indicated and required for testing and balancing purposes.

END OF SECTION

SECTION 15990

TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.
- B. The Basic Materials and Methods, Section 15050, are included as a part of this Section as though written in full in this document.

1.02 RELATED DOCUMENTS

Approved submittal date on equipment installed, to accomplish the test procedures, outlined under Services of the Contractor of this Section, will be provided by the Contractor.

1.03 DESCRIPTION

- A. The TAB of the air conditioning systems will be performed by an impartial technical firm whose operations are limited only to the field of professional TAB. The TAB work will be done under the direct supervision of a qualified engineer employed by the TAB firm.
- B. The TAB firm will be responsible for inspecting, adjusting, balancing, and logging the data on the performance of fans, dampers in the duct system, and air distribution devices. The Contractor and the various subcontractors of the equipment installed shall cooperate with the TAB firm to furnish necessary data on the design and proper applications of the system components and provide labor and material required to eliminate deficiencies or malperformance.

1.04 QUALITY ASSURANCE

- A. **QUALIFICATIONS OF CONTRACTOR PERSONNEL:** Submit evidence to show that the personnel who shall be in charge of correcting deficiencies for balancing the systems are qualified. The Owner and Engineer reserve the right to require that the originally approved personnel be replaced with other qualified personnel if, in the Owner and Engineer's opinion, the original personnel are not qualified to properly place the system in condition for balancing.
- B. **QUALIFICATIONS OF TAB FIRM PERSONNEL:**

1. A minimum of one registered Professional Engineer licensed in the State, is required to be in permanent employment of the firm.
 2. Personnel used on the jobsite shall be either Professional Engineers or technicians, who shall have been permanent, full time employees of the firm for a minimum of six months prior to the start of Work for that specified project.
 3. Evidence shall be submitted to show that the personnel who actually balance the systems are qualified. Evidence showing that the personnel have passed the tests required by the Associated Air Balance Council (AABC) shall be required.
- C. CALIBRATION LIST: Submit to the Engineer for approval, a list of the gauges, thermometers, velometer, and other balancing devices to be used in balancing the system. Submit evidence to show that the balancing devices are properly calibrated before proceeding with system balancing.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SERVICES OF THE CONTRACTOR

- A. The Drawings and specifications have indicated valves, dampers, and miscellaneous adjustment devices for the purpose of adjustment to obtain optimum operating conditions, install these devices in a manner that leaves them accessible, provide access as requested by the TAB firm.
- B. Have systems complete and in operational readiness prior to notifying the TAB firm that the project is ready for their services, and certify in writing to the Construction Manager that such a condition exists.
- C. As a part of the Work of this Section, make changes in the sheaves, belts, and dampers or the addition of dampers required for correct balance of the new work as required by the TAB firm, at no additional cost to the Owner.
- D. Fully examine the existing system to be balanced, to determine whether or not sufficient volume dampers, balancing valves, thermometers, gauges, pressure and temperature taps, means of reading static pressure and total pressure in duct systems, means of determining water flow, and other means of taking data needed for proper water and air balancing are existing. Submit to the Engineer in writing a listing of omitted items considered necessary to balance existing systems. Submit the list and proposal as a cost add item.
- E. Verify that fresh air louvers are free of blockage, coils are clean and fresh air ducts to each air handling unit has individually adjustable volume regulating

dampers.

- F. Provide, correct, repair, or replace deficient items or conditions found during the testing, adjusting, and balancing period.
- G. In order that systems may be properly tested, balanced, and adjusted as specified, operate the systems at no expense to the Owner for the length of time necessary to properly verify their completion and readiness for TAB period.
- H. Project Contract completion schedules shall provide time for allowances to permit the successful completion of TAB services to Owner's final inspection and acceptance. Complete, operational readiness, prior to commencement of TAB services, shall include the following services of the Contractor:
 - 1. Construction status of building shall permit the closing of doors, window, ceilings installed and penetrations complete, to obtain project operating conditions.
 - 2. AIR DISTRIBUTION SYSTEMS:
 - a. Verify installation for conformity to design. Supply, return, and exhaust ducts terminated and pressure tested for leakage as specified.
 - b. Volume and fire dampers properly located and functional. Dampers serving requirements of minimum and maximum outside air, return and relief shall provide tight closure and full opening, smooth and free operation.
 - c. Supply, return, exhaust and transfer grilles, registers and diffusers.
 - d. Air handling systems, units and associated apparatus, such as heating and cooling coils, filter sections, access doors, etc., shall be blanked and sealed to eliminate excessive bypass or leakage of air.
 - e. Fans (supply and exhaust) operating and verified for freedom from vibrations, proper fan rotation and belt tension; overload heater elements shall be of proper size and rating; record motor amperage and voltage and verify that these functions do not exceed nameplate ratings.
 - f. Furnish or revise fan drives or motors as necessary to attain the specified air volumes.
 - 3. AUTOMATIC CONTROLS:
 - a. Verify that control components are installed in accordance with project documents and functional, electrical interlocks, damper sequences, air and water resets, fire and freeze stats.
 - b. Controlling instruments shall be functional and set for design operating conditions. Factory precalibration of room thermostats and pneumatic equipment will not be acceptable.
 - c. The temperature regulation shall be adjusted for proper relationship between the controlling instruments and calibrated by the TAB

Contractor. Advise Owner of deficiencies or malfunctions.

3.02 SERVICES OF THE TAB FIRM

- A. The TAB firm will act as liaison between the Owner, Engineer, and the Contractor and inspect the installation of mechanical piping system, sheet metal work, temperature controls and other component parts of the heating, air conditioning and ventilating systems being retrofitted, repaired, or added under this Contract. The reinspection of the Work will cover that part related to proper arrangement and adequate provision for the testing and balancing and will be done when the Work is 80 percent complete.
- B. Upon completion of the installation and start-up of the mechanical equipment, to check, adjust, and balance system components to obtain optimum conditions in each conditioned space in the building. Prepare and submit to the Owner complete reports on the balance and operations of the systems.
- C. Measurements and recorded readings of air, water, and electricity that appear in the reports will be done by the permanently employed technicians or engineers of the TAB firm.
- D. Make an inspection in the building during the opposite season from that in which the initial adjustments were made. At the time, make necessary modifications to the initial adjustments required to produce optimum operation of system components to affect the proper conditions as indicated on the Drawings. At time of opposite season check-out, the Owner's representative will be notified before readings or adjustments are made.
- E. In fan systems, the air quantities indicated on the Drawings may be varied as required to secure a maximum temperature variation of two degrees within each separately controlled space, but the total air quantity indicated for each zone must be obtained. It shall be the obligation of the Contractor to furnish or revise fan drive and motors if necessary, without cost to the Owner, to attain the specified air volumes.
- F. The various existing water circulating systems shall be cleaned, filled, purged of air, and put into operation before hydronic balancing.

3.03 PROFESSIONAL REPORT

- A. Before the final acceptance of the report is made, the TAB firm will furnish the Owner the following data to be approved by the Owner and Engineer:
 - 1. Summary of main supply, return and exhaust duct pitot tube traverses and fan settings indicating minimum value required to achieve specified air

volumes.

2. A listing of the measured air quantities at each outlet corresponding to the temperature tabulation as developed by the Engineer and TAB firm.
3. Air quantities at each return and exhaust air handling device.
4. Static pressure readings entering and leaving each supply fan, exhaust fan, filter, coil, balancing dampers and other components of the systems included in the retrofit Work. These readings will be related to performance curves in terms of the CFM handled if available.
5. Motor current readings at each equipment motor on load side of capacitors. The voltages at the time of the reading shall be listed.
6. The final report shall certify test methods and instrumentation used, final velocity reading obtained, temperatures, pressure drops, RPM of equipment, amperage of motors, air balancing problems encountered, recommendations and uncompleted punch list items. The test results will be recorded on standard forms.
7. A summary of actual operating conditions shall be included with each system outlining normal and ventilation cycles of operation. the final report will act as a reference of actual operating conditions for the Owner's operating personnel.

3.04 BALANCING AIR CONDITIONING SYSTEM

A. GENERAL:

1. Place all equipment into full operation, and shall continue the operating during each working day of balancing and testing. If the air conditioning system is balanced during Off-Peak cooling season Balancing Contractor shall return to rebalance air side system as required to put system in proper balance at that time.
2. The Contractor shall submit detailed balancing and recording forms for approval. After the approval by the Architect, prepare complete set of forms for recording test data on each system. All Work shall be done under the supervision of a Registered Professional Engineer. All instruments used shall be accurately calibrated to within 1% of scale and maintained in good working order.
3. Upon completion of the balancing and testing, the Balancing Contractor shall compile the test data in report forms, and forward five copies to the Architect for evaluation.
4. The final report shall contain logged results of all tests, including such data as:
 - a. Tabulation of air volume at each outlet.
 - b. Outside dry bulb and wet bulb temperature.
 - c. Inside dry bulb and wet bulb temperatures in each conditioned space room or area.
 - d. Actual fan capacities and static pressures. Motor current and

voltage readings at each fan.

B. AIR SYSTEMS: Perform the following operations as applicable to system balance and test:

1. Check fan rotation.
2. Check filters (balancing shall be done with clean filters).
3. Test and adjust blower rpm to design requirements.
4. Test and record motor full load amperes.
5. Test and record system static pressures, suction and discharge.
6. Test and adjust system for design cfm, return air and outside air (+2%).
Change-out fan sheaves as required to balance system.
7. Test and record entering air temperatures, db and wb.
8. Test and record leaving air temperatures, db and wb.
9. Adjust all zones to design cfm (+2%).
10. Test and adjust each diffuser, grille, and register to within 5% of design.

C. AIR DUCT LEAKAGE: (From SMACNA Duct Standards 3rd Edition) Test all ductwork (designed to handle over 1000 CFM) as follows:

1. Test apparatus
The test apparatus shall consist of:
 - a. A source of high pressure air--a portable rotary blower or a tank type vacuum cleaner.
 - b. A flow measuring device consisting of straightening vanes and an orifice plate mounted in a straight tube with properly located pressure taps. Each orifice assembly shall be accurately calibrated with its own calibration curve. Pressure and flow readings shall be taken with U-tube manometers.
2. Test Procedures
 - a. Test for audible leaks as follows:
 - 1) Close off and seal all openings in the duct section to be tested. Connect the test apparatus to the duct by means of a section of flexible duct.
 - 2) Start the blower with its control damper closed.
 - 3) Gradually open the inlet damper until the duct pressure reaches 1.2 times the standard designed duct operating pressure.
 - 4) Survey all joint for audible leaks. Mark each leak and repair after shutting down blower. Do not apply a retest until sealants have set.
 - b. After all audible leaks have been sealed, the remaining leakage should be measured with the orifice section of the test apparatus as follows:
 - 1) Start blower and open damper until pressure in duct reaches 25% in excess of designed duct operating pressure.

- 2) Read the pressure differential across the orifice on manometer No. 2. If there is no leakage, the pressure differential will be zero.
- 3) Total allowable leakage shall not exceed one (1) percent of the total system design air flow rate. When partial sections of the duct system are tested, the summation of the leakage for all sections shall not exceed the total allowable leakage.
- 4) Even though a system may pass the measured leakage test, a concentration of leakage at one point may result in a noisy leak which, must be corrected.

D. DX SYSTEMS:

1. Test and record suction and discharge pressures at each compressor and record ambient air temperature entering the condensing coils.
2. Test and record unit full load amps and voltage.
3. Test and record staging and unloading of unit required by sequence of operation or drawing schedule.

E. Automatic temperature controls shall be calibrated and all thermostats and dampers, adjusted so that the control system is in proper operating condition, subject to the approval of the Architect.

F. The Air Balance Contractor shall report to Engineer all air distribution devices or other equipment that operate noisily so that corrective measures may be implemented by the Contractor at no additional cost to the Owner or Architect/Engineer.

END OF SECTION

SECTION 16050

BASIC MATERIALS AND METHODS

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all Work herein.
- B. The Contract Drawings indicate the extent and general arrangement of the systems. If any departure from the Contract Drawings are deemed necessary by the Contractor, details of such departures and the reasons therefore, shall be submitted to the Architect for approval as soon as practicable. No such departures shall be made without the prior written approval of the Architect.

1.02 SCOPE OF WORK

- A. The Work included under this Contract consists of the furnishing and installation of all equipment and material necessary and required to form the complete and functioning systems in all of its various phases, all as shown on the accompanying Drawings and/or described in these Specifications. The contractor shall review all pertinent drawings, including those of other contracts prior to commencement of Work.
- B. This Division requires the furnishing and installing of all items Specified herein, indicated on the Drawings or reasonably inferred as necessary for safe and proper operation; including every article, device or accessory (whether or not specifically called for by item) reasonably necessary to facilitate each system's functioning as indicated by the design and the equipment specified. Elements of the work include, but are not limited to, materials, labor, supervision, transportation, storage, equipment, utilities, all required permits, licenses and inspections. All work performed under this Section shall be in accordance with the Project Manual, Drawings and Specifications and is subject to the terms and conditions of the Contract.
- C. The approximate locations of Electrical items are indicated on the Drawings. These Drawings are not intended to give complete and accurate details in regard to location of outlets, apparatus, etc. Exact locations are to be determined by actual measurements at the building, and will in all cases be subject to the Review of the Owner or Engineer, who reserves the right to make any reasonable changes in the locations indicated without additional cost to the Owner.
- D. Items specifically mentioned in the Specifications but not shown on the Drawings and/or items shown on Drawings but not specifically mentioned in the

Specifications shall be installed by the Contractor under the appropriate section of work as if they were both specified and shown.

- E. All discrepancies between the Contract Documents and actual job-site conditions shall be reported to the Owner or Engineer so that they will be resolved prior to the bidding, where this cannot be done at least 7 working days prior to bid; the greater or more costly of the discrepancy shall be bid. All labor and materials required to perform the work described shall be included as part of this Contract.
- F. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and fully operating system in cooperation with other trades.
- G. It is the intent of the above "Scope" to give the Contractor a general outline of the extent of the Work involved; however, it is not intended to include each and every item required for the Work. Anything omitted from the "Scope" but shown on the Drawings, or specified later or necessary for a complete and functioning heating, ventilating and air conditioning system shall be considered a part of the overall "Scope".
- H. The Contractor shall rough-in fixtures and equipment furnished by others from rough-in and placement drawings furnished by others. The Contractor shall make final connection to fixtures and equipment furnished by others.
- I. Contractor shall participate in the commissioning process; including but not limited to meeting attendance, completion of checklists and participation in functional testing.

1.03 RELATED SECTIONS

- A. General Conditions
- B. Supplementary Conditions
- C. Division 1

1.04 COOPERATION WITH TRADES:

- A. Cooperation with trades of adjacent, related, or affected materials or operations shall be considered a part of this work in order to affect timely and accurate placing of work and bring together in proper and correct sequence, the work of such trades.

1.05 REFERENCES

- A. National Electrical Code (NEC)
- B. American Society for Testing and Materials (ASTM)
- C. Underwriter's Laboratories, Inc. (UL)
- D. Insulated Cable Engineer's Association (ICEA).
- E. National Electrical Manufacturer's Association (NEMA).
- F. Institute of Electrical and Electronic's Engineers (IEEE).
- G. American National Standards Institute (ANSI).
- H. National Fire Protection Association (NFPA).
- I. International Energy Conservation Code (IECC).

1.06 COMPLETE FUNCTIONING OF WORK:

- A. All work fairly implied as essential to the complete functioning of the electrical systems shown on the Drawings and Specifications shall be completed as part of the work of this Division unless specifically stated otherwise. It is the intention of the Drawings and Specifications to establish the types of the systems, but not set forth each item essential to the functioning of the system. In case of doubt as to the work intended, or in the event of amplification or clarification thereof, the Contractor shall call upon the Architect for supplementary instructions, Drawings, etc.
- B. Contractor shall review all pertinent Drawings and adjust his work to all conditions shown there on. Discrepancies between Plans, Specifications, and actual field conditions shall be brought to the prompt attention of the Architect.
 - 1. Approximate location of transformers, feeders, branch circuits, outlets, lighting and power panels, outlets for special systems, etc., are indicated on the Drawings. However, the Drawings, do not give complete and accurate detailed locations of such outlets, conduit runs, etc., and exact locations must be determined by actual field measurement. Such locations will, at all times, be subject to the approval of the Architect.
 - 2. Communicate with the Architect and secure his approval of any outlet (light fixture, receptacle, switch, etc.) location about which there may be the least question. Outlets obviously placed in a location not suitable to the finished room or without specific approval, shall be removed and relocated when so directed by the Architect. Location of light fixtures shall be coordinated with reflected ceiling plans.

- C. Additional coordination with mechanical contractor may be required to allow adequate clearances of mechanical equipment, fixtures and associated appurtenances. Contractor to notify Architect and Engineer of unresolved clearances, conflicts or equipment locations.

1.07 SCHEMATIC NATURE OF CONTRACT DOCUMENTS

- A. The contract documents are schematic in nature in that they are only to establish scope and a minimum level of quality. They are not to be used as actual working construction drawings. The actual working construction drawings shall be the approved shop drawings.

1.08 CONTRACTOR'S QUALIFICATIONS

- A. An approved contractor for the work under this Division shall be:
 - 1. A specialist in this field and have the personnel, experience, training, and skill, and the organization to provide a practical working system.
 - 2. Able to furnish evidence of having contracted for and installed not less than 3 systems of comparable size and type that have served their Owners satisfactorily for not less than 3 years.
 - 3. Perform work by persons qualified to produce workmanship of specified quality. Persons performing electrical work shall be required to be licensed. Onsite supervision, journeyman shall have minimum of journeyman license. Helpers, apprentices shall have minimum of apprentice license.

1.09 DATE OF FINAL ACCEPTANCE

- A. The date of final acceptance shall be the date of owner occupancy, or the date all punch list items have been completed or final payment has been received. Refer to Division 1 for additional requirements.
- B. The date of final acceptance shall be documented in writing and signed by the architect, owner and contractor.

1.10 DEFINITIONS AND SYMBOLS

- A. General Explanation: A substantial amount of construction and Specification language constitutes definitions for terms found in other Contract Documents, including Drawings which must be recognized as diagrammatic and schematic in nature and not completely descriptive of requirements indicated thereon. Certain terms used in Contract Documents are defined generally in this article, unless defined otherwise in Division 1.

- B. Definitions and explanations of this Section are not necessarily either complete or exclusive, but are general for work to the extent not stated more explicitly in another provision of the Contract Documents.
- C. Indicated: The term "Indicated" is a cross-reference to details, notes or schedules on the Drawings, to other paragraphs or schedules in the Specifications and to similar means of recording requirements in Contract Documents. Where such terms as "Shown", "Noted", "Scheduled", "Specified" and "Detailed" are used in lieu of "Indicated", it is for the purpose of helping the reader locate cross-reference material, and no limitation of location is intended except as specifically shown.
- D. Directed: Where not otherwise explained, terms such as "Directed", "Requested", "Accepted", and "Permitted" mean by the Architect or Engineer. However, no such implied meaning will be interpreted to extend the Architect's or Engineer's responsibility into the Contractor's area of construction supervision.
- E. Reviewed: Where used in conjunction with the Engineer's response to submittals, requests for information, applications, inquiries, reports and claims by the Contractor the meaning of the term "Reviewed" will be held to limitations of Architect's and Engineer's responsibilities and duties as specified in the General and Supplemental Conditions. In no case will "Reviewed" by Engineer be interpreted as a release of the Contractor from responsibility to fulfill the terms and requirements of the Contract Documents.
- F. Furnish: Except as otherwise defined in greater detail, the term "Furnish" is used to mean supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
- G. Install: Except as otherwise defined in greater detail, the term "Install" is used to describe operations at the project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance.
- H. Provide: Except as otherwise defined in greater detail, the term "Provide" is used to mean "Furnish and Install", complete and ready for intended use, as applicable in each instance.
- I. Installer: Entity (person or firm) engaged by the Contractor or its subcontractor or Sub-contractor for performance of a particular unit of work at the project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance. It is a general requirement that such entities (Installers) be expert in the operations they are engaged to perform.

- J. Imperative Language: Used generally in Specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by the Contractor. For clarity of reading at certain locations, contrasting subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or when so noted by other identified installers or entities.
- K. Minimum Quality/Quantity: In every instance, the quality level or quantity shown or specified is intended as minimum quality level or quantity of work to be performed or provided. Except as otherwise specifically indicated, the actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable tolerance limits. In complying with requirements, indicated or scheduled numeric values are either minimums or maximums as noted or as appropriate for the context of the requirements. Refer instances of uncertainty to Owner or Engineer via a request for information (RFI) for decision before proceeding.
- L. Abbreviations and Symbols: The language of Specifications and other Contract Documents including Drawings is of an abbreviated type in certain instances, and implies words and meanings which will be appropriately interpreted. Actual word abbreviations of a self explanatory nature have been included in text of Specifications and Drawings. Specific abbreviations and symbols have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of Specification requirements with notations on Drawings and in Schedules. These are frequently defined in Section at first instance of use or on a Legend and Symbol Drawing. Trade and industry association names and titles of generally recognized industry standards are frequently abbreviated. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of Contract Documents so indicate. Except as otherwise indicated, graphic symbols and abbreviations used on Drawings and in Specifications are those recognized in construction industry for indicated purposes. Where not otherwise noted symbols and abbreviations are defined by 1993 ASHRAE Fundamentals Handbook, chapter 34 "Abbreviations and Symbols", ASME and ASPE published standards.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.
- B. Deliver products to the project at such time as the project is ready to receive the equipment, pipe or duct properly protected from incidental damage and weather damage.
- C. Damaged equipment shall be promptly removed from the site and new,

undamaged equipment shall be installed in its place promptly with no additional charge to the Owner.

1.12 SUBMITTALS

- A. Coordinate with Division 1 for submittal timetable requirements, unless noted otherwise within thirty (30) days after the Contract is awarded the Contractor shall submit a minimum of eight (8) complete bound sets of shop drawings and complete data covering each item of equipment or material. The first submittal of each item requiring a submittal must be received by the Architect or Engineer within the above thirty day period. The Architect or Engineer shall not be responsible for any delays or costs incurred due to excessive shop drawing review time for submittals received after the thirty (30) day time limit. The Architect and Engineer will retain one (1) copy each of all shop drawings for their files. Where full size drawings are involved, submit one (1) print and one (1) reproducible sepia or vellum in lieu of eight (8) sets. All literature pertaining to an item subject to Shop Drawing submittal shall be submitted at one time. A submittal shall not contain information from more than one Specification section, but may have a section subdivided into items or equipment as listed in each section. The Contractor may elect to submit each item or type of equipment separately. Each submittal shall include the following items enclosed in a suitable binder:
1. A cover sheet with the names and addresses of the Project, Architect, MEP Engineer, General Contractor and the Subcontractor making the submittal. The cover sheet shall also contain the section number covering the item or items submitted and the item nomenclature or description.
 2. An index page with a listing of all data included in the Submittal.
 3. A list of variations page with a listing all variations, including unfurnished or additional required accessories, items or other features, between the submitted equipment and the specified equipment. If there are no variations, then this page shall state "NO VARIATIONS". Where variations affect the work of other Contractors, then the Contractor shall certify on this page that these variations have been fully coordinated with the affected Contractors and that all expenses associated with the variations will be paid by the submitting Contractor. This page will be signed by the submitting Contractor.
 4. Equipment information including manufacturer's name and designation, size, performance and capacity data as applicable. All applicable Listings, Labels, Approvals and Standards shall be clearly indicated.
 5. Dimensional data and scaled drawings as applicable to show that the submitted equipment will fit the space available with all required Code and maintenance clearances clearly indicated and labeled at a minimum scale of 1/4" = 1'-0", as required to demonstrate that the alternate or substituted product will fit in the space available.

6. Identification of each item of material or equipment matching that indicated on the Drawings.
 7. Sufficient pictorial, descriptive and diagrammatic data on each item to show its conformance with the Drawings and Specifications. Any options or special requirements or accessories shall be so indicated. All applicable information shall be clearly indicated with arrows or another approved method.
 8. Additional information as required in other Sections of this Division.
 9. Certification by the General Contractor and Subcontractor that the material submitted is in accordance with the Drawings and Specifications, signed and dated in long hand. Submittals that do not comply with the above requirements shall be returned to the Contractor and shall be marked "**REVISE AND RESUBMIT**".
- B. Refer to Division 1 for additional information on shop drawings and submittals.
- C. Equipment and materials submittals and shop drawings will be reviewed for compliance with design concept only. It will be assumed that the submitting Contractor has verified that all items submitted can be installed in the space allotted. Review of shop drawings and submittals shall not be considered as a verification or guarantee of measurements or building conditions.
- D. Where shop drawings and submittals are marked "**REVIEWED**", the review of the submittal does not indicate that submittals have been checked in detail nor does it in any way relieve the Contractor from his responsibility to furnish material and perform work as required by the Contract Documents.
- E. Shop drawings shall be reviewed and returned to the Contractor with one of the following categories indicated:
1. **REVIEWED:** Contractor need take no further submittal action, shall include this submittal in the O&M manual and may order the equipment submitted on.
 2. **REVIEWED AS NOTED:** Contractor shall submit a letter verifying that required exceptions to the submittal have been received and complied with including additional accessories or coordination action as noted, and shall include this submittal and compliance letter in the O&M manual. The contractor may order the equipment submitted on at the time of the returned submittal providing the Contractor complies with the exceptions noted.
 3. **NOT APPROVED:** Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is not approved, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or

drawings. Contractor shall not order equipment that is not approved. Repetitive requests for substitutions will not be considered.

4. **REVISE AND RESUBMIT:** Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked revise and resubmit, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or provide as noted on previous shop drawings. Contractor shall not order equipment marked revise and resubmit. Repetitive requests for substitutions will not be considered.
 5. **CONTRACTOR'S CERTIFICATION REQUIRED:** Contractor shall resubmit submittal on material, equipment or method of installation. The Contractor's stamp is required stating the submittal meets all conditions of the contract documents. The stamp shall be signed by the General Contractor. The submittal will not be reviewed if the stamp is not placed and signed on all shop drawings.
 6. **MANUFACTURER NOT AS SPECIFIED:** Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked manufacturer not as specified, the Contractor will automatically be required to furnish the product, material or method named in the specifications. Contractor shall not order equipment where submittal is marked manufacturer not as specified. Repetitive requests for substitutions will not be considered.
- F. Materials and equipment which are purchased or installed without shop drawing review shall be at the risk of the Contractor and the cost for removal and replacement of such materials and equipment and related work which is judged unsatisfactory by the Owner or Engineer for any reason shall be at the expense of the Contractor. The responsible Contractor shall remove the material and equipment noted above and replace with specified equipment or material at his own expense when directed in writing by the Architect or Engineer.
- G. Shop Drawing Submittals shall be complete and checked prior to submission to the Engineer for review.
- H. Furnish detailed shop drawings, descriptive literature, physical data and a specification critique for each section indicating "compliance" and/or "variations" for the following items:
1. Lighting and Appliance Panelboards
 2. Wiring Gutters
 3. Heavy Duty Disconnect Switches
 4. Lighting Fixtures
 5. Lighting Contactors
 6. Wiring Devices and Plates
 7. Conduit and Fittings
 8. Wire

9. Fire Alarm System
10. Surge Protection Device (SPD)

I. Refer to each specification section for additional requirements.

1.13 OPERATION AND MAINTENANCE MANUALS

- A. Prepare maintenance manuals in accordance with Division 1 and in addition to the requirements specified in Division 1, include the following information for equipment items:
1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
 2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
 3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
 4. Servicing instructions and lubrication charts and schedules.

1.14 COORDINATION DRAWINGS

- A. Prepare coordination drawings to a scale of 1/4"=1'-0" or larger; detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:
1. Indicate the proposed locations of pipe, duct, equipment, and other materials. Include the following:
 - a. Wall and type locations.
 - b. Clearances for installing and maintaining insulation.
 - c. Locations of light fixtures and sprinkler heads.
 - d. Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.
 - e. Equipment connections and support details.
 - f. Exterior wall and foundation penetrations.
 - g. Routing of storm and sanitary sewer piping.
 - h. Fire-rated wall and floor penetrations.
 - i. Sizes and location of required concrete pads and bases.

- j. Valve stem movement.
 - k. Structural floor, wall and roof opening sizes and details.
 2. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
 3. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
 4. Prepare reflected ceiling plans to coordinate and integrate installations, air distribution devices, light fixtures, communication systems components, and other ceiling-mounted items.
- B. This Contractor shall be responsible for coordination of all items that will affect the installation of the work of this Division. This coordination shall include, but not be limited to: voltage, ampacity, capacity, electrical and piping connections, space requirements, sequence of construction, building requirements and special conditions.
- C. By submitting shop drawings on the project, this Contractor is indicating that all necessary coordination has been completed and that the systems, products and equipment submitted can be installed in the building and will operate as specified and intended, in full coordination with all other Contractors and Subcontractors.

1.15 RECORD DRAWINGS

1. Maintain a continuous record during the course of construction of all changes and deviations in the work from the contract drawings. Upon completion of the work, purchase a set of "Auto Positive Tracings" on vellum and make corrections as required to reflect the electrical systems as installed. Location and size of all conduit shall be accurately shown to dimension. Submit three prints of the tracings for approval. Make corrections to tracings as directed and deliver "Auto Positive Tracings" to the Architect. Record drawings shall be furnished in addition to shop drawings. Symbols on the Record drawings shall correspond to the identification symbols on the contract drawings and equipment identification plates and tags.
2. The Contractor shall maintain a set of clearly marked black line record "AS-BUILT" prints on the job site on which he shall mark all work details, alterations to meet site conditions and changes made by "Change Order" notices. These shall be kept available for inspection by the Owner, Architect or Engineer at all times.
3. Refer to Division 1 for additional requirements concerning record drawings. If the Contractor does not keep an accurate set of as-built drawings, the pay request may be altered or delayed at the request of the Architect. Mark the drawings with a colored pencil. Delivery of as-built prints and reproducibles is a condition of final acceptance.
4. The record prints shall be updated on a daily basis and shall indicate accurate dimensions for all buried or concealed work, precise locations of all concealed

pipe or duct, locations of all concealed valves, controls and devices and any deviations from the work shown on the Construction Documents which are required for coordination. All dimensions shall include at least two dimensions to permanent structure points.

5. Submit three prints of the tracings for approval. Make corrections to tracings as directed and delivered "Auto Positive Tracings" to the architect. "As-Built" drawings shall be furnished in addition to shop drawings.
6. When the option described in paragraph F., above is not exercised then upon completion of the work, the Contractor shall transfer all marks from the submit a set of clear concise set of reproducible record "AS-BUILT" drawings and shall submit the reproducible drawings with corrections made by a competent draftsman and three (3) sets of black line prints to the Architect or Engineer for review prior to scheduling the final inspection at the completion of the work. The reproducible record "AS-BUILT" drawings shall have the Engineers Name and Seal removed or blanked out and shall be clearly marked and signed on each sheet as follows:

CERTIFIED RECORD DRAWINGS

DATE:

(NAME OF GENERAL CONTRACTOR)

BY: _____
(SIGNATURE)

(NAME OF SUBCONTRACTOR)

BY: _____
(SIGNATURE)

1.16 CERTIFICATIONS AND TEST REPORTS

- A. Submit a detailed schedule for completion and testing of each system indicating scheduled dates for completion of system installation and outlining tests to be performed and schedule date for each test. This detailed completion and test schedule shall be submittal at least 90 days before the projected Project completion date.
- B. Test result reporting forms shall be submitted for review no later than the date of the detailed schedule submitted.
- C. Submit 4 copies of all certifications and test reports to the Architect or Engineer for review adequately in advance of completion of the Work to allow for remedial action as required to correct deficiencies discovered in equipment and systems.

- D. Certifications and test reports to be submitted shall include, but not be limited to those items outlined in Section of Division 16.

1.17 MAINTENANCE MANUALS

- A. Coordinate with Division 1 for maintenance manual requirements, unless noted otherwise bind together in “D ring type” binders by National model no. 79-883 or equal, binders shall be large enough to allow ¼” of spare capacity. Three (3) sets of all approved shop drawing submittals, fabrication drawings, bulletins, maintenance instructions, operating instructions and parts exploded views and lists for each and every piece of equipment furnished under this Specification. All sections shall be typed and indexed into sections and labeled for easy reference and shall utilize the individual specification section numbers shown in the Electrical Specifications as an organization guideline. Bulletins containing information about equipment that is not installed on the project shall be properly marked up or stripped and reassembled. All pertinent information required by the Owner for proper operation and maintenance of equipment supplied by Division 16 shall be clearly and legibly set forth in memoranda that shall, likewise, be bound with bulletins.
- B. Prepare maintenance manuals in accordance with Special Project Conditions, in addition to the requirements specified in Division 16, include the following information for equipment items:
 - 1. Identifying names, name tags designations and locations for all equipment.
 - 2. Fault Current calculations and Coordination Study.
 - 3. Reviewed shop drawing submittals with exceptions noted compliance letter.
 - 4. Fabrication drawings.
 - 5. Equipment and device bulletins and data sheets clearly highlighted to show equipment installed on the project and including performance curves and data as applicable, i.e., description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and model numbers of replacement parts.
 - 6. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
 - 7. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions, servicing instructions and lubrication charts and schedules.
 - 8. Equipment name plate data.

9. Wiring diagrams.
 10. Exploded parts views and parts lists for all equipment and devices.
 11. Color coding charts for all painted equipment and conduit.
 12. Location and listing of all spare parts and special keys and tools furnished to the Owner.
 13. Furnish recommended lubrication schedule for all required lubrication points with listing of type and approximate amount of lubricant required.
- C. Refer to Division 1 for additional information on Operating and Maintenance Manuals.
- D. Operating and Maintenance Manuals shall be turned over to the Owner or Engineer a minimum of 14 working days prior to the beginning of the operator training period.

1.18 OPERATOR TRAINING

- A. The Contractor shall furnish the services of factory trained specialists to instruct the Owner's operating personnel. The Owner's operator training shall include 12 hours of on site training in three 4 hour shifts.
- B. Before proceeding with the instruction of Owner Personnel, prepare a typed outline in triplicate, listing the subjects that will be covered in this instruction, and submit the outline for review by the Owner. At the conclusion of the instruction period obtain the signature of each person being instructed on each copy of the reviewed outline to signify that he has a proper understanding of the operation and maintenance of the systems and resubmit the signed outlines.
- C. Refer to other Division 16 Sections for additional Operator Training requirements.

1.19 SITE VISITATION

- A. Visit the site of the proposed construction in order to fully understand the facilities, difficulties and restriction attending the execution of the work.
- B. Before submitting a bid, it will be necessary for each Contractor whose work is involved to visit the site and ascertain for himself the conditions to be met therein in installing his work and make due provision for same in his bid. It will be assumed that this Contractor in submitting his bid has visited the premises and that his bid covers all work necessary to properly install the equipment shown. Failure on the part of the Contractor to comply with this requirement shall not be considered justification for the omission or faulty installation of any work covered by these Specifications and Drawings.

- C. Understand the existing utilities from which services will be supplied; verify locations of utility services, and determine requirements for connections.
- D. Determine in advance that equipment and materials proposed for installation fit into the confines indicated.

1.20 WARRANTY

- A. The undertaking of the work described in this Division shall be considered equivalent to the issuance, as part of this work, of a specific guarantee extending one year beyond the date of completion of work and acceptance by Owner, against defects in materials and workmanship. Materials, appliances and labor necessary to effect repairs and replacement so as to maintain said work in good functioning order shall be provided as required. Replacements necessitated by normal wear in use or by Owner's abuse are not included under this guarantee.
- B. All normal and extended warranties shall include parts, labor, miscellaneous materials, travel time, incidental expenses, freight/shipping, refrigerant, oils, lubricants, belts, filters and any expenses related to service call required to diagnose warranty problems.

1.21 TRANSFER OF ELECTRONIC FILES

- A. Project documents are not intended or represented to be suitable for reuse by Architect/Owner or others on extensions of this project or on any other project. Any such reuse or modification without written verification or adaptation by Engineer, as appropriate for the specific purpose intended, will be at Architect/Owner's risk and without liability or legal exposure to Engineer or its consultants from all claims, damages, losses and expense, including attorney's fees arising out of or resulting thereof.
- B. Because data stored in electric media format can deteriorate or be modified inadvertently, or otherwise without authorization of the data's creator, the party receiving the electronic files agrees that it will perform acceptance tests or procedures within sixty (60) days of receipt, after which time the receiving party shall be deemed to have accepted the data thus transferred to be acceptable. Any errors detected within the sixty (60) day acceptance period will be corrected by the party delivering the electronic files. Engineer is not responsible for maintaining documents stored in electronic media format after acceptance by the Architect/Owner.
- C. When transferring documents in electronic media format, Engineer makes no representations as to the long term compatibility, usability or readability of documents resulting from the use of software application packages, operating

systems, or computer hardware differing from those used by Engineer at the beginning of the Project.

- D. Any reuse or modifications will be Contractor's sole risk and without liability or legal exposure to Architect, Engineer or any consultant.
- E. The Texas Board of Architectural Examiners (TBAE) has stated that it is in violation of Texas law for persons other than the Architect of record to revise the Architectural drawings without the Architect's written consent.

It is agreed that "MEP" hard copy or computer-generated documents will not be issued to any other party except directly to the Architect/Owner. The contract documents are contractually copyrighted and cannot be used for any other project or purpose except as specifically indicated in AIA B-141 Standard Form of Agreement between Architect and Owner.

If the client, Architect/Owner, or developer of the project requires electronic media for "record purposes", then an AutoCAD based compact disc ("CD") will be prepared. The "CD" will be submitted with all title block references intact and will be formatted in a "plot" format to permit the end user to only view and plot the drawings. Revisions will not be permitted in this configuration.

- F. At the Architect/Owner's request, Engineer will prepare one "CD" of electronic media to assist the contractor in the preparation of submittals. The Engineer will prepare and submit the "CD" to the Architect/Owner for distribution to the contractor. All copies of the "CD" will be reproduced for a cost of reproduction fee of Five Hundred Dollars (\$500.00) per "CD".

The "CD" will be prepared and all title blocks, names and dates will be removed. The "CD" will be prepared in a ".dwg" format to permit the end user to revise the drawings.

- G. This Five Hundred Dollars (\$500.00) per "CD" cost of reproduction will be paid directly from the Contractor to the Engineer. The "CD" will be prepared only after receipt of the Five Hundred Dollars (\$500.00). The Five Hundred Dollars (\$500.00) per "CD" cost of reproduction is to only recover the cost of the manhours necessary to reproduce the documents. It is not a contractual agreement between the Contractor and Engineer to provide any engineering services, nor any other service.

PART 2 - PRODUCTS

2.01 SUBSTITUTIONS

- A. The names and manufacturers and model numbers have been used in the Contract documents to establish types of equipment and standards of quality. Where more

than one manufacturer is named for a specific item of equipment, only one of the specified manufacturers will be considered for approval. Where only one manufacturer is mentioned with the phrase "or approved equal", Contractor may submit an alternate manufacturer for consideration, provided the following conditions are met:

1. Submit alternate equipment with complete descriptive data in shop drawing form. Provide sample of equipment upon request for review by Architect. Samples will be returned if requested in writing.
2. Alternate equipment must be equal from the standpoint of materials, construction and performance.
3. Alternate submittal must be presented to the Engineer/Architect ten (10) days prior to bid date for approval.

B. The Architect and Engineer shall be the sole judge of quality and equivalence of equipment, materials and methods.

2.02 All materials and products used on this project shall be listed by Underwriters' Laboratories.

2.03 ACCESS DOORS

A. Wherever access is required in walls or ceilings to concealed junction boxes, pull boxes, equipment, etc., installed under this Division, furnish a hinged access door and frame with flush latch handle to another Division for installation. Doors shall be as follows:

1. Plaster Surfaces: Milcor Style K.
2. Ceramic Tile Surfaces: Milcor Style M.
3. Drywall Surfaces: Milcor Style DW.
4. Install panels only in locations approved by the Architect.

2.04 EQUIPMENT PADS

A. Unless noted otherwise 4" high concrete pads for floor mounted equipment shall be installed under Division 3. Pads shall conform to the shape of the equipment with a minimum of 3" margin at equipment supports. Top and sides of pads shall be troweled to a smooth finish, equal to floor. External corners shall be bullnosed to a 3/4" radius, unless shown otherwise.

2.05 ESCUTCHEONS

A. Provide heavy chrome or nickel plated plates, of approved pattern, on conduit passing through walls, floors and ceilings in finished areas. Where conduit passes through a sleeve, no point of the conduit shall touch the building construction.

Caulk around such conduit with sufficient layers of two hour rated firesafing by Thermafiber 4.0 P.C.F. density, U.S.G. fire test 4/11/78 and seal off openings between conduit and sleeves with non-hardening mastic prior to application of escutcheon plate. Escutcheons shall be Gravler Sure-Lock, or approved equal.

2.06 SPACE LIMITATIONS

- A. Equipment shall be chosen which shall properly fit into the physical space provided and shown on the drawings, allowing ample room for access, servicing, removal and replacement of parts, etc. Adequate space shall be allowed for clearances in accordance with Code requirements. Physical dimensions and arrangement of equipment shall be subject to the approval of the Architect.

2.07 PAINTING

- A. All factory assembled equipment for electrical work, except light fixtures, that normally is delivered with a factory applied finish shall be delivered with a hard surface factory applied finish such as baked-on machinery enamel which will not require additional field painting. The finish shall consist of not less than 2 coats of medium gray color paint USA No. 61 Munsell Notation 8-3G, 6. 10/0.54 enamel. This Contractor shall protect this finish from damage due to construction operations until acceptance of the building. He shall be responsible for satisfactorily restoring any such finishes or replacing equipment that becomes stained or damaged.

2.08 ELECTRICAL SYSTEM IDENTIFICATION

- A. Conduit Systems: Provide adequate marking of major conduit which is exposed or concealed in accessible spaces to distinguish each run as either a power or signal/communication conduit. Except as otherwise indicated, use orange banding with black lettering. Provide self-adhesive or snap-on type plastic markers. Indicate voltage for that raceway. Locate markers at ends of conduit runs, on pull boxes, on junction boxes, near switches and other control devices, near items of equipment served by the conductors, at points where conduit passes through walls or floors, or enters non-accessible construction and at spacings of not more than 50 feet along each run of conduit. Switch-leg conduit and short branches for power connections do not have to be marked, except where conduit is larger than $\frac{3}{4}$ inch. Branch circuit conduits, junction boxes and pull boxes shall be marked with a permanent marker indicating panel name and branch circuit numbers.
- B. Underground Cable Identification: Bury a continuous, preprinted, bright colored plastic ribbon cable marker with each underground cable (or group of cables), regardless of whether conductors are in conduit, duct bank, or direct buried. Locate each directly over cables, 6 to 8 inches below finished grade.

C. Identification of Equipment:

1. All major equipment shall have a manufacturer's label identifying the manufacturer's address, equipment model and serial numbers, equipment size, and other pertinent data. Care shall be taken not to obliterate this nameplate in any way.
2. A black-white-black laminated plastic engraved identifying nameplate shall be secured by stainless steel screws to each automatic transfer switch, switchboard, distribution panel, motor control center, motor starter panels and panelboards.
 - a. Identifying nameplates shall have ¼ inch high engraved letters and shall contain the following information:
 - 1) Name
 - 2) Voltage
 - 3) Phase
 - 4) "3" or "4" wire, and
 - 5) Where it is fed from.
 - b. An example of a panelboard nameplate is:
Center Panel – 1HB
480/277 volt, 3 phase, 4 wire
Center Fed from DP2
 - c. An example of an automatic transfer switch nameplate is:
Center ATS #2
480/277 volt, 3 phase, 4 wire, 4 pole
Center Fed from MSB and DPE
3. Each feeder device in a switchboard, distribution panel, and motor control center device shall have a nameplate showing the load served in ½ inch high engraved letters.
4. A black-white-black laminated plastic engraved identifying nameplate shall be secured by screws to each safety switch, disconnect switch, individual motor starter, enclosed circuit breaker, wireway, and terminal cabinet.
 - a. Identifying nameplates shall have ¼ inch high engraved letters and shall indicate the equipment served.
 - b. An example if a disconnect switch is: AHU-1.
5. Cardholders and directory cards shall be furnished for circuit identification in panelboards. Cardholder shall be located on inside of panel door and shall be in a metal frame with clear plastic front. Circuit lists shall be typewritten. Circuit descriptions shall include location and name of each item of equipment served. Spares and spaces shall be written in erasable pencil for future use. Circuit directory shall show the room served by each circuit. The final graphs/signage room numbers shall be used. Do not use Architectural numbering on plans.
6. Prohibited Markings: Markings which are intended to identify the

manufacturer, vendor, or other source from which the material has been obtained are prohibited for installation within public, tenant, or common areas within the project. Also, prohibited are materials or devices which bear evidence that markings or insignias have been removed. Certification, testing (example, Underwriters' Laboratories, Inc.), and approval labels are exceptions to this requirement.

7. Warning Signs: Provide warning signs where there is hazardous exposure associated with access to or operation of electrical facilities. Provide text of sufficient clarity and lettering of sufficient size to convey adequate information at each location; mount permanently in an appropriate and effective location. Comply with recognized industry standards for color and design.
8. Operational Tags: Where needed for proper and adequate information on operation and maintenance of electrical system, provide tags of plasticized card stock, either preprinted or hand printed. Tags shall convey the message, example: "DO NOT OPEN THIS SWITCH WHEN BURNER IS OPERATING."

PART 3 - EXECUTION

3.01 EXCAVATING AND BACKFILLING

- A. Trenching and backfilling and other earthwork operations required to install the facilities specified herein shall conform to the applicable requirements of Division 2 (95% of maximum standard density). Where trenching or excavation is required in improved areas, the backfill shall be compacted to a condition equal to that of adjacent undisturbed earth and the surface of the area restored to the condition existing prior to trenching or excavating operations. Provide a minimum of 3" of sand underneath all conduits. The plans indicate information pertaining to surface and sub-surface obstructions; however, this information is not guaranteed. Should obstructions be encountered whether or not shown, the Contractor shall alter routing of new work, reroute existing lines, remove obstructions where permitted, or otherwise perform whatever work is necessary to satisfy the purpose of new work and leave existing surfaces and structures in a satisfactory and serviceable condition. **All work shall comply with OSHA Standards.**

3.02 WORKMANSHIP AND CONCEALMENT

- A. The work of this Section shall be performed by workman skilled in their trade. Installation shall be consistent in completeness whether concealed or exposed. Each item of electrical work shall be concealed in walls, chases, under floors and above ceilings except:
 1. Where shown to be exposed.
 2. Where exposure is necessary to the proper function.

3.03 SLEEVES, CUTTING AND PATCHING

- A. This section shall be responsible for placing sleeves for all conduit passing through walls, partitions, sound walls, beams, floors, roof, etc. Sleeves through below-grade walls shall use water-tight fitting manufactured by O.Z. Gendey.
- B. All cutting and patching will be done under another Division, but this Section will be responsible for timely performance of this work and layout of holes and setting sleeves.
- C. All un-used sleeves shall be sealed with 2 hour UL approved fire sealant manufactured by “3M” or approved equal.
- D. Refer to 26 05 33 for additional requirements.

3.04 ELECTRICAL GEAR

- A. Install all electrical equipment in accordance with the National Electrical Code and as shown on the drawings.
- B. Lighting contractors, time clocks, disconnect switches, etc. mounted in mechanical/electrical rooms shall be mounted at a working height not requiring a ladder, when wall space is available. Installation of these devices at greater elevations shall be approved by the Engineer. Contractor shall provide a coordination sketch of each mechanical/electrical room noting locations and mounting heights of all electrical devices (note bottom and top elevations) shown to be installed. Sketches shall be provided to the Engineer for review and the general contractor for coordination with other trades working in these rooms.

3.05 CLEANING

- A. Clean lighting fixtures and equipment.
- B. Touch-up and refinish scratches and marred surfaces on panels, switches, starters, and transformers.

3.06 TESTS AND INSPECTIONS

- A. Tests and inspection requirements shall be coordinated with Division 1.
- B. Date for final acceptance test shall be sufficiently in advance of completion date of contract to permit alterations or adjustments necessary to achieve proper functioning of equipment prior to contract completion date.

- C. Conduct re-tests as directed by Architect on portions of work or equipment altered or adjusted as determined to be necessary by final acceptance test. No resultant delay or consumption of time as a result of such necessary re-test beyond contract completion date shall relieve Contractor of his responsibility under contract.

- D. Put circuits and equipment into service under normal conditions, collectively and separately, as may be required to determine satisfactory operation. Demonstrate equipment to operate in accordance with requirements of these specifications. Perform tests in the presence of Architect. Furnish instruments and personnel required for tests.

- E. Final Inspection:
 - 1. At the time designated by the Architect, the entire system shall be inspected by the Architect and Engineer. The contractor or his representative shall be present at this inspection.
 - 2. Panelboards, switches, fixtures, etc., shall be cleaned and in operating condition.
 - 3. Certificates and documents required hereinbefore shall be in order and presented to the Architect prior to inspection.
 - 4. Panel covers, junction box covers, etc., shall be removed for visual inspection of the wire, bus bars, etc.
 - 5. After the inspection, any items which are noted as needing to be changed or corrected in order to comply with these specifications and the drawings shall be accomplished without delay.

END OF SECTION

SECTION 16060

ELECTRICAL DEMOLITION FOR REMODELING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Electrical demolition.
- B. The contractor shall be responsible for loss or damage to the existing facilities caused by him and his workmen, and shall be responsible for repairing such loss or damage. The contractor shall send proper notices, make necessary arrangements, and perform other services required for the care, protection and in-service maintenance of all electrical services for the new and existing facilities. The contractor shall erect temporary barricades, with necessary safety devices, as required to protect personnel from injury, removing all such temporary protection upon completion of the work.
- C. Outages of services as required by the new installation will be permitted but only at a time approved by the Owner. The contractor shall allow the Owner 2 weeks in order to schedule required outages. The time allowed for outages will not be during normal working hours unless otherwise approved by the Owner. All costs of outages, including overtime charges, shall be included in the contract amount.
- D. The contractor shall provide temporary or new services to all existing facilities as required to maintain their proper operation when normal services are disrupted as a result of the work being accomplished under this project.

1.02 RELATED SECTIONS

- A. Section 01120 – Alteration Project Procedures.
- B. Section 02072 – Minor Demolition for Remodeling.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials and equipment for patching and extending work: As specified in individual Sections.
- B. Include in the contract price all rerouting of existing conduits, wiring, outlet boxes, fixtures, etc., and the reconnecting of existing fixtures as necessitated by field conditions to allow the installation of the new systems. Furnish all temporary conduit, wiring, boxes, etc., as required to maintain lighting and power service for the existing areas with a minimum of interruption. Remove wire and

conduit back to nearest accessible active junction box and extend to existing homeruns as required.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify field measurements and circuiting arrangements are as shown on Drawings.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.
- C. Demolition Drawings are based on casual field observation, and existing record documents. Report discrepancies to Owner before disturbing existing installation.
- D. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION

- A. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.
- B. Coordinate utility service outages with Utility Company.
- C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
- D. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Obtain permission from Owner at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.
- E. Existing Fire Alarm System: Maintain existing system in service until new system is accepted. Disable system only to make switchovers and connections. Notify Owner and local fire service at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.
- F. Existing Telephone System: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Notify Owner and Telephone Utility Company at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.
- G. Existing Public Address System: Maintain existing system in service until new system is complete and ready for service. Disable system only to make

switchovers and connections. Obtain permission from the Owner and at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Demolish and extend existing electrical work under provisions of Section 01120, Section 02072, and this Section.
- B. Remove, relocate, and extend existing installations to accommodate new construction.
- C. Remove abandoned wiring to source of supply.
- D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets, which are not removed.
- F. Disconnect and remove abandoned panelboards and distribution equipment.
- G. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- H. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.
- I. Repair adjacent construction and finishes damaged during demolition and extension work.
- J. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.
- K. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.
- L. Where existing construction is removed to provide working and extension access to existing utilities, contractor shall remove doors, piping, conduit, outlet boxes, wiring, light fixtures, air conditioning ductwork and equipment, etc., to provide this access and shall reinstall same upon completion of work in the areas affected.
- M. Where partitions, walls, floors, or ceilings of existing construction are being removed, all contractors shall remove and reinstall in locations approved by the

Architect all devices required for the operation of the various systems installed in the existing construction.

- N. During the construction and remodeling, portions of the project shall remain in service. Construction equipment, materials, tools, extension cords, etc., shall be arranged so as to present minimum hazard or interruption to the occupants of the building.
- O. Certain work during the demolition phase of construction may require overtime or nighttime shifts or temporary evacuation of the occupants. Coordinate and schedule all proposed down time with the Owner's Representative at least 72 hours in advance.
- P. All existing lighting fixtures, switches, outlets, speakers, materials, equipment and appurtenances not included in the remodel or alteration areas are to remain in place and shall remain in service.
- Q. Electrical equipment, outlets, speakers, circuits to mechanical and building systems equipment, etc., which are to remain but which are served by conduit and/or circuiting that is disturbed by the remodeling work, shall be reconnected in such a manner as to leave it in proper operating condition.
- R. Existing branch circuit wiring which is to be removed, shall be pulled from the raceways and the empty conduit shall be removed to a point of permanent concealment.
- S. Within the remodeled or alteration areas where existing walls are being removed, all existing lighting fixtures, switches, receptacles, other materials and equipment and their appurtenances shall be removed, where required by the remodel work either shown or specified.
- T. New circuiting indicated to be connected to existing panels shall be connected to "spares" and/or "released" breakers as applicable, or new breakers provided where space is available. Contractor shall verify the existing panel load and feeder capacity prior to adding any additional loads.
- U. In all the remodeled areas where existing ceilings are being removed and reinstalled, all existing lighting fixtures, other ceiling mounted devices (i.e. smoked detectors, speakers, etc.) and their appurtenances shall be removed and reinstalled, unless otherwise shown or specified. This also applies to new ceiling installations.

3.04 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment which remain or are to be reused.

- B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

3.05 INSTALLATION

- A. Install relocated materials and equipment under the provisions of Section 01120.

3.06 REMOVAL OF MATERIALS

- A. The contractor shall modify, remove, and/or relocate all materials and items so indicated on the drawings or required by the installation of new facilities. All removals and/or dismantling shall be conducted in a manner as to produce maximum salvage. Salvage materials shall remain the property of the Owner, and shall be delivered to such destination as directed by the Owner. Materials and/or items scheduled for relocation and which are damaged during dismantling or reassembly operations shall be repaired and restored to good operative condition. The contractor may, at his discretion and upon the approval of the Owner, substitute new materials and/or items of like design and quality in lieu of materials and/or items to be relocated.
- B. All items which are to be relocated shall be carefully removed in reverse to original assembly or placement and protected until relocated. The contractor shall clean, repair, and provide all new materials, fittings, and appurtenances required to complete the relocations and to restore to good operative order. All relocations shall be performed by workmen skilled in the work and in accordance with standard practice of the trades involved.
- C. When items scheduled for relocation are found to be in damaged condition before work has been started on dismantling, the contractor shall call the attention of the Owner to such items and receive further instructions before removal. Items damaged in repositioning operations are the contractor's responsibility and shall be repaired or replaced by the contractor as approved by the Owner, at no additional cost to the Owner.
- D. Service lines and wiring to items to be removed, salvaged, or relocated shall be removed to points indicated on the drawings, specified, or acceptable to the Owner. Service lines and wiring not scheduled for reuse shall be removed to the points at which reuse is to be continued or service is to remain. Such services shall be sealed, capped, or otherwise tied-off or disconnected in a safe manner acceptable to the Owner. All disconnections or connections into the existing facilities shall be done in such a manner as to result in minimum interruption of services to adjacent occupied areas. Services to existing areas or facilities which must remain in operation during the construction period shall not be interrupted without prior specific approval of the Owner as hereinbefore specified.

END OF SECTION

SECTION 16110

RACEWAYS

PART 1 - GENERAL

1.01 SCOPE

- A. Provide electrical raceways and fittings as shown, scheduled and specified.
- B. The types of raceways and fittings required are as follows:
 - 1. Rigid hot-dipped galvanized steel conduit (RGS)
 - 2. Intermediate hot-dipped galvanized steel conduit (IMC)
 - 3. Electrical metallic tubing (EMT)
 - 4. PVC
 - 5. Flexible metal conduit
 - 6. Liquid-tight flexible metal conduit (non-metallic is not acceptable)
 - 7. PVC coated rigid galvanized steel conduit

1.02 STANDARDS

- A. ANSI, C80.1 & C80.3
- B. NEMA FB-1
- C. NEMA TC3
- D. UL, 6, 797 & 1242

1.03 ACCEPTABLE MANUFACTURERS

- A. Raceways
 - 1. Allied
 - 2. Triangle
 - 3. Republic
 - 3. Carlon
 - 4. Wheatland Tube
 - 5. Cantex
 - 6. Western Tube
 - 7. Robroy Industries
- B. Fittings

1. Appleton
2. Crouse Hinds
3. Steel City
4. O.Z. Gedney
5. Carlon
6. Raco, Inc.

1.04 SUBMITTALS

A. Shop drawing shall include but not be limited to:

1. Cutsheets for raceways and fitting.

1.05 REQUIREMENTS OF REGULATORY AGENCIES WORK IN ACCORDANCE WITH:

- A. National Electrical Code.
- B. Local, municipal, or state codes that have jurisdiction.

PART 2 - PRODUCTS

2.01 PROVIDE CONDUIT AS FOLLOWS:

- A. Except as noted or otherwise specified, all wiring shall be installed in galvanized rigid steel, rigid aluminum conduit or electrical steel tube (EMT) of the proper size to contain the number of conductors required in accordance with the latest edition of the N.E.C. Where conduit sizes are shown on the drawings, these shall take preference. Contractor shall epoxy coat galvanized rigid steel conduit for use in natatoriums.
- B. EMT in sizes up to 4 inches when concealed or not exposed to damage and located indoors only.
- C. PVC coated rigid galvanized steel shall be used for all penetrations of slab on grade.
- D. Rigid galvanized steel where embedded in concrete or masonry construction, mechanical yard or in exterior/interior applications where subject to damage.
- E. Rigid aluminum shall be used in exterior applications. (i.e. roof, top of canopies)
- F. Carlon Schedule 40 PVC may be utilized underground, in or below slab where shown on the construction documents.

- G. MINIMUM SIZE: All homeruns shall be 3/4" minimum.
 - H. PVC coated rigid galvanized steel conduit shall be coated inside and outside.
 - I. PVC coated rigid galvanized steel conduit shall be used at cooling towers, corrosive areas and pool pump rooms.
 - J. Fixture whips: Refer to 16510 for additional information.
 - K. Flexible metal shall be used for connecting rotating equipment installed in conditioned spaces.
 - L. Sealtite shall be used for connecting rotating equipment installed in non-conditioned spaces and outside.
 - M. Bear the stamped approval of the UL and be approved by the Architect and Engineer.
- 2.02 Branch circuits run underground shall be run in Carlon Schedule 40 PVC conduit. Install ground wire in accordance with NEC table 250-122.
- 2.03 FITTINGS
- A. Couplings for rigid steel or intermediate conduit shall be hot dipped galvanized steel. Set screw type is not acceptable.
 - B. Steel or malleable iron fittings shall be used on all other raceway types except for PVC.
 - C. EMT systems shall utilize steel insulated throat, set screw connectors and steel set screw couplings in all indoor conditioned spaces. EMT system shall utilize steel insulated throat, threadless, watertight compression type connectors and steel threadless watertight compression type coupling in all non-conditioned spaces.
 - D. Coupling and connectors accessories and fittings for PVC coated rigid galvanized steel shall be PVC coated.
 - E. Metal sealtite fittings shall be steel. Plastic is not acceptable.
 - F. Provide nylon bushing on end of all low voltage cabling system conduits (sleeves, rough-ins, etc.).

PART 3 - EXECUTION

3.01 CONDUIT

A. GENERAL

The Drawings are diagrammatic, and are intended to show the general location of outlets, devices, fixtures, and arrangement and control of circuits. The Contractor shall determine exact locations by actual measurement of the building or by reference to the Architectural Drawings.

- B. Of such size, and so installed that conductors may be drawn in without injury or excessive strain.
- C. Where entering panels, pull boxes, junction boxes, or outlet boxes, shall be secured in place with lock nuts inside and outside, and insulated bushings inside.
- D. Have Red seal type VCC or approved equal cable supports in risers, as required by N.E.C.
- E. Have ends reamed after cutting and application of die.
- F. Keep conduit corked and dry during construction, and swab out before conductors are pulled.
- G. Have bends and offsets made with approved tools. Bends or offsets in which the pipe is crushed or deformed shall not be installed.
- H. Where not embedded in concrete or masonry, be firmly secured by approved clamps, half-straps or hangers.
- I. Have O.Z. Gedney or approved equal expansion fittings where crossing building expansion joints.
- J. EXPANSION JOINTS: Make provision for expansion and shifting of metal or PVC conduits where risers occur from underground.
- K. Except in the mechanical equipment rooms, run conduit concealed, and by the shortest practicable route between outlets. Install risers, drops, and offsets necessary to avoid conflict with ductwork, piping, structural members, and similar items.
- L. Install exposed conduit in mechanical rooms, and elsewhere as indicated, parallel to horizontal and vertical lines of walls, ceilings, and floors.
- M. In general, fluorescent fixtures in finished areas having suspended acoustical ceilings shall be connected to outlet boxes of lighting grid by flexible metal conduit; length not to exceed ten feet.

- N. Outlet boxes in partitions shall never be set back to back. They shall be offset to prevent undue noise transmission from room to room.
- O. Concealed conduit shall run in as direct manner as possible using long bends. Exposed conduit shall be run parallel with or at right angles to the lines of the building; and all bends shall be made with standard conduit elbows or conduit benders. Not more than equivalent of four quarter bends shall be used in any run between terminals and cabinet, of between outlet or junction boxes. Approved condulets shall be used in lieu of conduit elbows where ease of installation and appearance warrants their use and approved by the engineer. Conduit joints shall be made with approved couplings and unions.
- P. Conduits shall be continuous from outlet to outlet and from outlets to cabinets, junction or pull boxes and shall be electrically continuous throughout. Terminals of all conduits shall be provided with double lock nuts and bushing or terminated on conduit hubs. Use of running threads is prohibited.
- Q. Each entire conduit system shall be installed complete before any conductors are drawn in. Every run of conduit shall be finished before covering up to guard against obstructions and omissions.
- R. Sleeves shall be placed in the forms of concrete, masonry and fire rated walls, floor slabs and beams, for the passage of conduits. Sleeves should be set in place a sufficient time ahead of the concrete work so as not to delay the work. Sleeves shall be rigid galvanized steel and set to extend 4" above slab.
- S. All pipe penetrations through walls and concrete floors shall be fire rated by applying USG Thermafiber in the space between the concrete and the pipe. The fire rating shall be additionally sealed by using 3M brand model CP 25 or 303 fire barrier caulk and putty. All fire rating material shall be installed in accordance with manufacturer's printed instructions.
- T. All conduit shall be cleaned and swabbed to remove all foreign matter and moisture prior to pulling wire and cable. All boxes in which conduits terminate shall be cleaned of all concrete mortar and other foreign matter.
- U. Provide #30 nylon pulling line in all conduits in which permanent wiring is not installed.
- V. All conduits shall be securely fastened and supported using hot galvanized malleable iron one-hole pipe straps, clamps, hanger or other means approved by the engineer. Supports shall be as required by NEC Table 344-3 (B)(2). Tie wire shall not be used as support or securing means. Support conduit independently of ceiling hanger wire. Use all thread rods to support outlet boxes, junction boxes

and conduit.

- W. When PVC conduit is routed underground, all stub-up's and 90° elbows shall be PVC coated rigid galvanized steel. Use PVC coated rigid galvanized steel when penetrating concrete on grade.
- X. Route all conduit above grade unless otherwise noted on the construction documents.
- Y. Contact the Architect and Engineer for an installation review before covering any below grade or above grade conduit.
- Z. All new outlets shall be flush mounted. In remodeled areas where wall construction prohibits flush mounting, provide wiremold 2400 series. Verify exact location and routing with architect before installation.
- AA. Contractor shall not penetrate water proof barriers without using proper fitting to maintain barriers. This shall include exterior walls and slabs. Coordinate with Architect for proper methods.

3.02 FITTINGS

- A. Install approved expansion fitting in all conduit runs in excess of 150 feet or when crossing building expansion joints.

3.03 CONDUIT CORROSION PROTECTION

- A. Branch circuit conduits installed in concrete slabs on fill or grade shall be positioned in a manner to ensure complete concrete cover. In no case shall such conduits be exposed below or above the slab surfaces, or penetrate the waterproof membrane.
- B. At locations where metallic conduits pass through slabs on grade or transitions below grade, PVC coated rigid galvanized conduit shall be used.

3.04 OUTLET AND JUNCTION BOXES

- A. Provide an approved galvanized outlet box with adequate volume for number of conductors installed.
- B. Provide standard galvanized switch boxes of the required number of gangs. Switch boxes where conduit is exposed shall be handy boxes or approved equal.
- C. Outlet boxes for receptacles shall be similar to Universal 52151 with suitable raised cover. Receptacle boxes where conduit is exposed shall be handy boxes or

approved equal.

- D. Weatherproof boxes shall be FS or FD. Provide these boxes in all non-conditioned areas, exterior areas and natatoriums.
- E. Outdoor boxes shall be NEMA 3R, with conduit connections made by Myers Hubs.
- F. See notes and details on Drawings for special box requirements.
- G. Provide junction boxes required to facilitate installation of the various conduit systems. Provide support boxes required for risers, each complete with approved cable supports as described elsewhere in this Division.
- H. Outlet boxes for drywall shall be standard galvanized 4" square boxes with the appropriate device cover.
- I. Provide floor outlet fittings for telephone to match fittings for duplex floor receptacles.
- J. Provide 3-1/2" deep gangable masonry boxes in all masonry wall (CMU). Steel City GW-135-G or approved equal.
- K. Provide shallow 4"x4" boxes in all demountable partitions.
- L. Metallic boxes located in fire rated walls or partitions shall be separated by a minimum horizontal distance of 24 in. This minimum separation distance between metallic boxes may be reduced when "Wall Opening Protective Materials" (CLIV) are installed according to the requirements of their Classification. Metallic boxes shall not be installed on opposite side of walls or partitions of staggered stud construction unless "Wall Opening Protective Materials" are installed with the metallic boxes in accordance with Classification requirements for the protective materials.
- M. Junction, pull boxes, condulets, gutters, disconnects, contactors, etc., above 2-foot x 2-foot grid ceilings shall be mounted within 18-inches of ceiling grid. Above 2-foot x 4-foot grid ceiling they shall be mounted within 30-inches of ceiling grid. All junction box, pull box, gutter openings shall be side or bottom accessible.

3.05 THRU-WALL SEALS

- A. Provide O.Z. Gedney "Thru-wall" seals for all conduits passing through concrete structure below grade, above grade, and floor penetrations below grade. These prevent moisture from entering the building.

- B. Straight sleeves are not acceptable.

3.06 PULL BOXES

- A. Pull boxes shall be provided for conduit systems as required and shall be constructed of galvanized steel of not less than gauge and size specified by National Electrical Code.
- B. Where two or more feeders pass through a common pull box, they shall be tagged to indicate clearly their electrical characteristics, circuit number, and panel designation.

3.07 WIREWAYS

- A. Wireways shall be installed as indicated or required and locations shall be coordinated with architect.
- B. Wireways shall be made of not less than 16-gauge sheet steel for 4 inch and 6 inch square sizes and 14 gauge steel for 8 inch and 12 inch square sizes. Couplings end plates, and knockouts shall be furnished as required. Each section of wireways shall be rigidly supported.
- C. Wiring in wireways shall be neatly bundled, tied and suitably tagged.
- D. The finish shall be ANSI-49 gray epoxy paint applied by a cathodic electrode position paint process over a corrosion resistant phosphate preparation for NEMA 1 wireways. Provide galvanized steel for NEMA 3R wireways. NEMA 3R wireways and auxiliary gutters are for horizontal mounting only.

END OF SECTION

SECTION 16120

WIRE, CABLE AND RELATED MATERIALS

PART 1 - GENERAL

1.01 SCOPE

- A. Provide 600 volt building wire, cable and connectors and 300 volt wire, cable and connectors.
- B. **WORK INCLUDED:** Include the following Work in addition to items normally part of this Section.
 - 1. Wiring for lighting and power.
 - 2. Automatic Control Wiring.
 - 3. Connection of equipment shown.
 - 4. Fire Alarm System.
- C. **WORK SPECIFIED ELSEWHERE:**
 - 1. Heating, ventilating, and air conditioning equipment.
 - 2. Structured cabling system.
 - 3. Coaxial cables

1.02 STANDARDS

- A. UL83
- B. ASTM B-3
- C. All wire cable and connectors shall be UL approved.

1.03 ACCEPTABLE MANUFACTURERS

- A. **600 VOLT WIRE AND CABLE**
 - 1. Southwire
 - 2. Encore
 - 3. Cerro
- B. **300 VOLT WIRE AND CABLE**
 - 1. Westpenn
 - 2. Beldon

3. Alpha
4. Tappan-Southwire

C. FLEXIBLE CABLE SYSTEMS

1. AFC Modular Cable Systems

D. CONNECTORS

1. AMP-TYCO
2. Burndy
3. Ideal
4. 3M
5. O.Z. Gedney
6. Thomas & Betts

1.04 SUBMITTALS

- A. Shop drawings shall include, but not limited to:

1. Cutsheets of wire, cable and connectors to indicate the performance, fabrication procedures, product variations, and accessories.

1.05 REQUIREMENTS OF REGULATORY AGENCIES WORK IN ACCORDANCE WITH:

- A. National Electrical Code.
- B. Local, municipal, or state codes that have jurisdiction.

PART 2 - PRODUCTS

2.01 WIRING

- A. All wire shall be new and continuous without weld, splice, or joints throughout its length. It must be uniform in cross-section, free from flaws, scales and other imperfections.
- B. WIRE MATERIAL: Soft drawn, annealed, 98% pure copper, with tin coating. Aluminum wiring is not acceptable.
- C. TYPES:
1. Provide type "THHN/THWN" insulation for all buried feeders and service entrance conductors.

2. Provide type "THHN/THWN" insulation for all branch circuits and above grade feeders.
3. All wire No. 8 and larger shall be stranded. All wire No. 10 and smaller shall be stranded or solid.
4. Provide type "XHHW" or other 90 degrees insulation wiring for branch circuit wiring installed through continuous rows of fluorescent fixture bodies.
5. All 300-volt cable including but not limited to telephone, fire alarm, data, CATV and security shall be UL listed for use in return air plenums.

D. CONDUCTOR SIZES

1. Feeder conductors shall be sized for a maximum of 2% drop in rated voltage at scheduled load.
2. Branch circuit conductors shall be sized for a maximum 3% drop in the rated voltage to the longest outlet on the circuit.
3. Minimum wire shall be No. 12, unless otherwise shown on Drawings or required by Code.

E. COLOR CODING: No. 6 or larger shall use tape for color coding. No. 8 and smaller wire shall be color coded in accordance with the governing authority requirements or as follows:

<u>120/208 VOLT</u>	<u>277/480 VOLT</u>	<u>120/240 VOLT</u>
NEUTRAL: White	Neutral: Gray	Neutral: White
PHASE A: Black	Phase A: Brown	Phase A: Black
PHASE B: Red	Phase B: Purple	Phase B: Orange
PHASE C: Blue	Phase C: Yellow	Phase C: Blue
GROUND: Green	Ground: Green	Ground: Green

2.02 GROUNDING

Permanently connect all conduit work, motors, starters, and other electrical equipment to grounding system in accordance with the National Electrical Code.

2.03 METAL CLAD CABLE - TYPE MC

At the contractor's option, metal clad cable (MC) may be used if approved by the authority having jurisdiction. The cable shall contain an insulated green grounding conductor (3 wire) and shall be the same size as the phase conductor. Conductors shall be solid copper and the armor shall be flexible galvanized steel.

PART 3 - EXECUTION

3.01 WIRE

- A. Do not pull wire into conduit until Work of an injurious nature is completed. Where two or more circuits run to a single outlet box, each circuit shall be properly tagged. Wyreze or approved equal may be used as a lubricant where necessary.
- B. Splices shall be fully made up in outlet boxes with compression crimp-on type splice connectors.
- C. Joints and splices will not be permitted in service entrance or in feeders. Joints in branch circuits will be permitted where branch circuits divide, and then shall consist of one through-circuit to which the branch shall be spliced. Joints shall not be left for the fixture hanger to make. Connect joints and splices with Buchanan Series "2000" solderless connectors complete with insulating caps or properly sized wire nuts.
- D. All stranded conductors shall be furnished with lugs or connectors.
- E. Connectors furnished with circuit breakers or switches shall be suitable for copper wire termination.
- F. "Sta-Cons" shall be used to terminate stranded conductors on all switches and receptacles.
- G. Metal Clad Cable - Type MC
 - 1. Metal clad cable shall not be used for homeruns. Metal clad cable shall only be used for branch circuit drops from ceiling mounted junction boxes to outlets and for horizontal runs in a common wall from outlet to outlet. Do not route to outlets to adjacent walls. Metal clad cable may be looped from outlet to outlet in areas where non-accessible ceilings are used. Metal clad cable shall only be used in air-conditioned areas and shall not be run exposed.
 - 2. Metal clad cable shall be UL approved connectors and shall be used and installed per Article 334 of the National Electrical Code. The cable shall be supported at intervals not exceeding 6 feet and within 12 inches of every box.
 - 3. Provide anti-short bushing at cable ends.
 - 4. Refer to electrical details for additional information and restrictions.
 - 5. Metal clad cable shall not be installed in concrete.
- G. Armored Cable - Type AC
 - 1. Not Allowed.

H. All stranded #10 and small conductors shall be terminated with an approved solderless terminal if the device or light fixture does not have provisions for clamp type securing of the conductor.

I. The jacket for all travelers used on 3-way and 4-way switches shall be pink.

3.02 BALANCING SYSTEM

The load on each distribution and lighting panel shall be balanced to within 10% by proper arrangement of branch circuits on the different phase legs. Provide written documentation showing results. Submit with O & M manuals.

3.03 LOW VOLTAGE WIRING

A. Low voltage wiring shall be plenum rated. All wiring in mechanical rooms, electrical rooms, drywall ceiling, inaccessible areas, underground, plaster ceiling, inside concealed walls areas exposed to occupant view, and other areas subject to physical damage shall be run in conduit.

B. Low voltage wiring shall be routed in separate raceways from power wiring systems.

C. Sleeves shall be placed in the forms of concrete, masonry and fire rated walls, floor slabs and beams, for the passage of wiring. Sleeves should be set in place a sufficient time ahead of the concrete work so as not to delay the work. Sleeves shall be rigid galvanized steel.

3.04 CABLE SUPPORTS

A. Provide cable supports in all vertical raceways in accordance with Article 300-19 of the NEC.

3.05 DEFECTS

A. Defects shall include, but are not to limited to, the following:

1. Tripping circuit breakers under normal operation.
2. Improperly connected equipment.
3. Damaged, torn, or skinned insulation.

END OF SECTION

SECTION 16140

WIRING DEVICES

PART 1 - GENERAL

1.01 SCOPE

- A. Provide wiring devices as shown; scheduled, required and as specified.
- B. The types of wiring devices required include:
 - 1. Receptacles
 - 2. Switches
 - 3. Coverplates

1.02 STANDARDS

- A. NEMA WD-1
- B. NEMA WD-5
- C. UL
- D. Federal Spec WC-596-F and WS-896

1.03 ACCEPTABLE MANUFACTURERS

- A. Leviton Manufacturing
- B. Hubbell
- C. Pass & Seymour

1.04 SUBMITTALS

- A. Shop drawings shall include but not limited to:
 - 1. Cut sheets of all devices indicating NEMA configuration, rating, materials, color, and all accessories.
 - 2. Cut sheets of all coverplates indicating materials, color and any engraving specified on drawing or in the specifications.

1.05 REQUIREMENTS OF REGULATORY AGENCIES WORK IN ACCORDANCE WITH:

- A. National Electrical Code.
- B. Local, municipal, or state codes that have jurisdiction.

PART 2 - PRODUCTS

2.01 MATERIALS AND COMPONENTS

A. GENERAL

- 1. Provide factory assemble wiring devices with the rating type and color as required and specified for the service indicated.
- 2. Provide matching one-piece multiple gang plates where switches are ganged. Provide wall plates for each receptacle furnished.
- 3. Architect reserves the right to select wiring device styles and colors to match wall finish.
- 4. Wall plates shall be of same manufacturer as devices.

2.02 SWITCHES

- A. Provide specification grade Ivory toggle switches where indicated on the Drawings. Provide "Red" switches for switching emergency lighting circuits where switching is indicated. Coordinate exact locations with architect.
- B. Wall switches shall be 20 amp, 120-277 volt and shall be Leviton, Hubbell or P&S as follows:
 - 1. SINGLE POLE SWITCHES:
Leviton 1221-2, Hubbell HBL 1221, P&S PS20AC1
 - 2. DOUBLE POLE SWITCHES:
Leviton 1222-2, Hubbell HBL 1222, P&S PS20AC2
 - 3. THREE WAY SWITCHES:
Leviton 1223-2, Hubbell HBL 1223, P&S PS20AC3
 - 4. FOUR WAY SWITCHES:
Leviton 1224-2, Hubbell HBL 1224, P&S PS20AC4
 - 5. MOMENTARY CONTACT SWITCHES:
Leviton 1257, Hubbell HBL 1557, P&S 1251
 - 6. THREE POSITION, TWO CIRCUIT MAINTAINED CONTACT SWITCHES:
Leviton 1285, Hubbell HBL 1385, P&S 1225
 - 7. KEY TYPE LOCKABLE CORBIN STYLE:
Leviton 1221-2KL with 2KL key or P&S PS20AC1-KL with 4609 key for each switch, Hubbell #HBL 1221-RKL.
- C. Dimmers: Provide Lutron Nova "T" series or Leviton or as shown on drawings.

Wall box dimmers shall be sized to handle the load. Where fluorescent dimming ballasts are to be used, coordinate wall box dimmer with ballast manufacturer.

- D. Light Handle Switches: Provide Leviton 1221-7L-LHC, Hubbell HBL1221-IL, P&S PS20AC1-ISL lighted handles to switch emergency lights were noted on the drawings.

2.03 RECEPTACLES

- A. Provide specification grade Ivory receptacles where indicated on the Drawings. Provide "Red" receptacles for receptacles on emergency power. Coordinate exact location with architect.
- B. Receptacles shall be Leviton, Hubbell or Pass & Seymour as follows:
 - 1. Duplex 20A-125V-self grounding: (Nema configuration 5-20R):
Leviton 5362, Hubbell HBL5362, P&S 5362A
 - 2. Simplex 20A-125V-Self Grounding: (Nema configuration 5-20R):
Leviton 5361, Hubbell HBL5361, P&S 5361
 - 3. Isolated ground duplex, 20A-125V: (Orange, Nema configuration 5-20R)
Leviton 5362IG, Hubbell IG5362, P&S IG6300.
 - 4. Clock hanger receptacle 15A-125V: (Brown with stainless steel plate with hanger, Nema configuration 5-15R).
Leviton 5361-CH, Hubbell 5235, P&S S3733-SS
 - 5. Ground fault circuit interrupter (GFCI) receptacle 20A-125V; (Nema Configuration 5-20R, shall incorporate features which will lock-out or render the device incapable of being reset if ground fault protection is compromised, with "Feed through" connectors capable of protecting connected downstream receptacles on a single circuit, and of being installed in a 2-3/4" deep outlet box without adapter, Leviton 8899, P & S 2094.
 - 6. Tamper resistant receptacles 20A-125V (Nema configuration 5-20R):
Leviton 8300-SG, Hubbell HBL8300SG, P&S TR63-H.
 - 7. Surge Protection Duplex Receptacles 20A-125V, (Nema 5-20R) Hospital grade to include LED light and audible alarm:
Leviton 8380, Hubbell HBL 8362SA, P&S 8300SP
 - 8. Equipment receptacles shall be coordinated with owner/manufacture requirements and the correct and appropriate receptacle and coverplate shall be installed.

2.04 Floor boxes shall be cast iron as manufactured by Hubbell or equal by Wiremold and as indicated below:

- A. Slab at grade (dual level, fully adjustable type 1).
 - 1. Single gang: #B-2436 w/#SB-3083 carpet flange.

2. Two gang: #B-4233 w/#SB-3084 carpet flange.
 3. Three gang: #B-4333 w/#SB-3085 carpet flange.
- B. Slab above grade (shallow, semi-adjustable, type II)
1. Single gang: #B-2414 w/#SB-3083 carpet flange.
 2. Two gang: #B-4214 w/#SB-3084 carpet flange.
 3. Three gang: #B-4314 w/#SB-3085 carpet flange.
- C. Cover plates shall have brass finish as follows:
1. #S-3825 for duplex flap for duplex receptacles.
 2. #S-2425 for data/communications.
- 2.05 PVC floor boxes manufactured by Wiremold shall be as follows:
- A. Provide #881 dual service PVC floor box with divider and 897CTC cover.
- 2.06 PLATES
- A. Furnish and install plates on all outlet boxes. Oversize (Jumbo) plates are not acceptable.
- B. Plates shall be 302/304 smooth stainless steel.
- C. Provide Taymac Bell, Carlon or Leviton Metallic NEMA 3R weatherproof coverplates on all exterior wiring devices. Enclosure shall be suitable for wet locations when in use.
- D. Plates shall be Leviton, Pass & Seymour or Hubbell 302/304 smooth stainless steel on all receptacles 30 amps and larger.
- 2.07 Fire rated poke through devices shall be as follows:
- A. Flush fire rated poke through devices shall be Wiremold RC2001 Series (black) with pre-wired 20A, 125V duplex receptacle and (4) individual openings for telephone, signal or Category 5 data cables.
- B. Poke through devices with above floor service fittings shall be Wiremold RC700 Series with (1) 20A, 125V duplex receptacle and telephone data cover plate.

PART 3 - EXECUTION

3.01 WIRING DEVICE MOUNTING HEIGHTS

- A. Unless noted to the contrary on plans, or directed otherwise during the progress of the Work, wiring devices shall be set as follows:

1. Switches 42" above finished floor.
2. Wall mounted receptacles shall be installed vertically at 15 inches to the bottom outlet above finished floor unless otherwise noted or as required by local codes.
3. Wall telephone outlets shall be mounted 15 inches to the bottom above finished floor unless otherwise noted. Mount even with wall mounted receptacles.
4. At locations above counters, set devices at 6 inches above to the centerline counter tops, verify exact mounting height with the architect.

3.02 INSTALLATION (Refer to 16110/3.04 for outlet box specifications.)

- A. Wall switches shall be set in a suitable steel box and shall be installed on the strike side of the door as finally hung, whether so indicated on the Drawings or not.
- B. Receptacles shall be installed in a suitable steel box.
- C. The Architect reserves the right to relocate wiring device up to a distance of 5 feet from the location shown, before rough-in, without additional cost.
- D. Provide multi-gang device covers at locations where devices gang together.
- E. Device locations are indicated schematically on the drawings along with the type and mounting height. Final locations and mounting heights shall be coordinated with the Architect on the jobsite, and with shop drawings of equipment; including equipment to be furnished and installed by the Owner. Devices installed in walls covered with vinyl, fabric wallpaper or other special finishes shall be coordinated and verified with the Architect on the job-site.
- F. Stranded wire termination to switches, receptacles, devices and miscellaneous control devices shall be with an approved solderless terminal if clamp type securing is not possible (i.e. Sta-Con crimp on fork tongue connectors; Burndy Type TP-F).
- G. Provide keyed switches in all common areas not monitored by the faculty (i.e. gym, corridors, cafeteria, commons and natatoriums).

END OF SECTION

SECTION 16450

GROUNDING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

1.02 SCOPE

- A. **WORK COMBINED WITH OTHER SECTIONS:** Combine the work specified herein with the following Sections to form a single responsibility for the Work:
 - 1. Electrical.
 - 2. Basic materials and methods.
- B. Provide electrical service, equipment and wiring device grounding as shown, scheduled and as specified.
- C. The types of grounding include, but not limited to, the grounding bonding of all equipment devices, building steel piping, and as required by the National Electrical Code, Local Inspection Department and Power Company.

1.03 STANDARDS

- A. NATIONAL ELECTRICAL CODE (NFPA-70)
- B. Local municipal and State codes that have jurisdiction.
- C. NECA

1.04 ACCEPTABLE MANUFACTURES

- A. Provide grounding products manufactured by Copperweld and Cadweld.

1.05 SUBMITTALS

- A. Shop drawings shall include, but not limited to the following:
 - 1. Cut sheets of ground rods, clamps and connectors.
 - 2. Grounding system diagram.

PART 2 - PRODUCTS

- A. GENERAL: Provide all materials required to construct a complete grounded electrical system.
- B. GROUND RODS: Ground rods shall be 3/4" inch diameter by 10 feet long construction with copper jacket and a steel core.
- C. CLAMPS: Ground clamps shall be copper except for steel or iron pipes in which the clamps shall be galvanized iron.
- D. CONDUCTORS: Conductors shall be connected by means of an approved pressure connector or clamp.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. GENERAL: Install grounding system as shown and specified to ensure a properly grounded system.
- B. SERVICE ENTRANCE GROUNDING SYSTEM: Provide a main bonding jumper between the neutral and ground bus of each switchboard. Route a separate grounding electrode conductor in conduit from each main distribution panel to the ground rod grid, incoming cold water piping system, and to the "lightning protection system" (250 - 106 of NEC) under ground bonding loop. Provide a bonding jumper around water meter. The grounding electrode conductor shall be stranded copper, 98% conductivity and shall be run continuous without splices or joints and installed at least 12" below grade.
- C. BUILDING STEEL AND PIPING SYSTEM: Install a bonding jumper between building steel and metallic piping systems to bond them to the electrical grounding system.
- D. NEUTRAL: The neutral shall be grounded only at the service entrance and other separately derived systems. The neutral shall be kept separate from the grounding system and shall not be used as a ground.
- E. GROUNDING SEPARATELY DERIVED ALTERNATING CURRENT SYSTEM
 - 1. TRANSFORMERS: The center point (neutral) of each wye connected transformer shall be bonded to the case and a grounding electrode conductor shall be connected to a ground rod or building steel.

- F. **GROUNDING CONDUCTOR:** A grounding conductor and metallic conduit system shall bond all equipment served by the electrical system. Provide a flexible bonding jumper for isolated metallic piping and ductwork and around expansion fittings and joints.
 - G. **CONDUIT GROUNDING BUSHING:**

Conduit terminating in equipment that has a ground bus such as switchboards, panelboards, etc., shall have grounding bushings installed. Ground each conduit by means of a grounding bushing and to the ground bus in the equipment.
 - H. **MOTORS:** The frame of all motors shall be grounded.
 - I. **SPECIAL GROUNDING:** Provide a #6 AWG copper grounding conductor for each telephone board, television system, etc. Terminate the grounding conductor on ground bus and to the building electrical grounding system. Refer to 800-40(d) and 820-40(d) of the NEC.
 - J. **REMOTE PANELBOARDS:** Provide a grounding electrode conductor all remote panels as required by the NEC and shown on drawings.
 - K. **LIGHTING FIXTURES:** Flexible fixture whips containing a green grounding conductor shall be used to connect light fixtures. Flexible fixture whips shall not exceed ten feet.
 - L. **RECEPTACLES:** All receptacles shall be grounded using the branch circuit grounding conductor. Receptacles shall use an approved grounding yoke.
- 3.02 **TESTING:** Perform a ground resistance test using a biddle analog or digital portable earth/ground resistance tester. The system resistance shall not exceed 5 OHMS. Provide additional electrodes as required (refer to 250-84 of the NEC or the most current edition 250-56). Test shall not be conducted following wet weather. Provide personal instruments to conduct these tests and submit certified test for review. Test shall be verified by Engineer.

END OF SECTION

SECTION 16510

LIGHTING FIXTURES

PART 1 - GENERAL

1.01 SCOPE

- A. Furnish and install general and emergency lighting fixtures as noted on the drawings. Fixtures shall be completely wired with lamps installed and shall be in perfect operating condition at the time of substantial completion.
- B. The types of lighting fixtures required for this project include:
 - 1. Fluorescent
 - 2. Incandescent and
 - 3. High-Intensity-Discharge (HID)

1.02 STANDARDS

- A. All fixtures shall conform to all applicable UL standards and shall be UL label including damp and wet location ratings.
- B. All fluorescent ballast shall comply with certified ballast manufacture (CBM) standard and CBM labeled.
- C. NFPA 101
- D. ANSI C82.1
- E. NEMA-LE
- F. IEEE Publication 587 Category "A" (Electronic Ballast)

1.03 ACCEPTABLE MANUFACTURERS

- A. Provide lighting fixtures produced by manufacturers as shown and scheduled.
- B. BALLAST:
 - 1. Provide one of the following manufacturers
 - a. Advance Transformer Company
 - b. Universal Lighting Technologies
 - c. Osram Sylvania
- C. LAMPS:
 - 1. Provide one of the following manufacturers

- a. General Electric Company
- b. Osram Sylvania
- c. North American Philips

1.04 SUBMITTALS

- A. Shop drawings shall include a brochure with a separate cut sheet for each fixture type arranged in alphabetical order with fixture and all accessories/options clearly labeled. Provide performance data for each fixture. Provide an independent test lab report for each fixture if requested by the Architect/Engineer.
- B. Provide ballast and lamp data brochures indicating which lamp and ballast (if required) will be used in each fixture type.
- C. Furnish air handling and heat removal data for light fixtures specified with these requirements.

1.05 REQUIREMENTS OF REGULATORY AGENCIES

- A. WORK IN ACCORDANCE WITH:
 - 1. National Electrical Code.
 - 2. Local, municipal, or state codes that have jurisdiction.
 - 3. UL fire resistance directory.

PART 2 - PRODUCTS

2.01 MATERIALS AND COMPONENTS

- A. General: Provide the size, type and rating of each light fixture shown and scheduled. All light fixtures shall complete with reflectors, lens, trim rings, flanges, lamps, lamp holders, ballast, starters, fuses, wiring, earthquake clips, etc. to provide a complete functioning light fixture.
- B. Lighting Fixture Types:
 - 1. Fluorescent Fixtures
 - a. Fixture ballast and lamp holders shall be pre-wired and installed. Fixture shall be equipped with a top access plate with knockouts for conduit entry. Fixture shall also include knockouts at each end plate for conduit entry.
 - b. Provide disconnect switch as required by the 2008 National Electrical Code.
 - c. Fixtures shall be cold roll steel finished using a multistage iron phosphate pretreatment to ensure maximum bonding and rust inhibitor. Finish shall be a lighting grade, baked white enamel finish with a minimum reflectance of 85%.

- d. Door frame shall be heavy gauge flush white steel or aluminum and hinged from one side and use a positive spring action latch on the other side for latching.
 - e. Any lamp shall be easily replaced without removing another lamp.
 - f. Fixtures installed in continuous rows shall utilize nipples or other accessories such as snap together plug in connectors supplied by the fixture manufacturer.
 - g. Provide battery ballast for emergency light fixtures.
2. Incandescent Fixtures
- a. Fixtures shall be pre-wired equipped with frame in kit and an integral thermal protection required by UL for recessed fixtures.
 - b. Provide appropriate trim rings for recessed mounted fixtures compatible with the ceiling in which the fixture is installed.
 - c. All lamps shall be inside frosted unless otherwise noted or scheduled.
3. High Intensity Discharge Fixtures (HID)
- a. Fixtures shall be pre-wired with frame-in kit and integral thermal protection required by UL for recessed fixtures. Ballast shall be encased and potted and mounted on the frame-in kit.
 - b. Provide remote ballast mounted on a separate mounting plate where indicated or scheduled. Ballast shall include a splice box.
 - c. Provide a heat resistant glass shield below the lamp to contain lamp glass envelope and ARC tube to prevent them from falling to the floor and causing damage to life and property. Lamp rated for open fixtures may be used in lieu of glass shield if approved by the engineer.
 - d. Provide a fuse and fuse holder installed on the line side of each ballast to prevent branch circuit from tripping due to faulty ballast. The fuse and fuse holder shall be mounted in a junction box for recessed fixtures and in the base of all poles. The fuse holder shall be waterproof when installed in damp or wet locations. Fuse size and type shall be as recommended by ballast manufacturer.
4. Exit signs
- a. Exit signs shall meet all federal, state and local codes.
 - b. Provide fire alarm interface relay when required to flash exit signs.
 - c. Provide battery packs for emergency operation when specified.

2.02 BALLASTS - COORDINATE WITH LIGHT FIXTURE SCHEDULE

A. Fluorescent

- 1. High efficiency electronic ballast shall be high power factor (98% minimum), operate lamp at 40 KHz, less than 10% total harmonic content, NORMAL BALLAST FACTOR (.88) , crest factor less than 1.7, parallel lamp configuration universal voltage, multi-lamp, class "P" thermally

protected, sound "A" rating, encased and potted and 0°F minimum starting temperature. Provide 5 year warranty parts and labor. Ballast shall be Osram Sylvania QHE series or approved equal by Universal Lighting Technologies or Advance Transformer Company.

2. All outdoor ballast unless otherwise noted shall be high power factor, rapid start, class P thermally protected, encased and potted, sound rating B and a 0°F temperature rating. Ballast shall be CBM certified by an ETL and UL approved.
3. Provide suitable dimming ballast where indicated.
4. Compact fluorescent ballast shall be electronic, shall have circuitry designed to shut down the system reliably and safely when lamps have reached their end of life, high power factor, sound rating "A" and UL approved. Provide 5-year warranty, parts and labor.

B. HID

1. Provide high power factor, constant wattage auto-transformer with a -20 degree F temperature rating. Ballast shall have a sound rating of "B" for lamps less than 400 watts. Ballast for recessed downlights or located remotely shall be encased and potted and shall be provided with a splice box. Provide 120 volt tap for auxiliary lamp when specified.

2.03 LAMPS – COORDINATE WITH LIGHT FIXTURE SCHEDULE

- A. F032T8 fluorescent lamps shall be 24,000 hours 3,500°K, 32 watt and low mercury. Life rating is based on 3 hours/start.
- A. All incandescent lamps shall be inside frosted, extended life rated for 2500 hours unless otherwise noted. 130 volt lamps may be used to provide extended life.
- B. All HID lamps shall be base up, base down, horizontal, or universal burn as indicated or specified.
- C. All compact fluorescent (T5 and smaller diameter) lamps shall be 3500°K and 4-pin

2.04 EMERGENCY FLUORESCENT BATTERY BALLAST

- A. Provide Bodine #B50 emergency battery ballast for emergency light fixtures using T8 or T12 lamps in 9 or 10 foot ceiling.
- B. Provide Bodine #B30 Emergency Ballast for emergency light fixtures using T8 lamps in ceiling heights greater than 12 feet.
- C. Provide Bodine #B84C emergency battery ballast for emergency light fixtures

using compact fluorescent lamps.

- D. Provide unswitched hot leg. Hot leg shall originate from the same branch circuit as required in NEC article 700.12 (F).

2.05 SPARE LAMPS

- A. Provide 5% spare lamps, minimum of 3 of each type.
- B. Ship lamps to the Owner in original cartons (loose lamps are not acceptable).

PART 3 - EXECUTION

3.01 INSTALLATIONS

- A. General
 1. Install the type of light fixture where shown and indicated in accordance with manufacturer's written instructions.
 2. Provide earthquake clips on all recessed lay-in light fixtures as required by building code.
 3. Adjust all adjustable light fixtures, as directed by the Architect.
 4. Provide safety chains and wire guards for light fixtures located in gymnasium, multi-purpose rooms, play areas, etc.
- B. Coordination
 1. The contractor shall verify the type of fixtures with the ceiling types as indicated on the drawings. Any discrepancies shall immediately be brought to the architect's attention before the contractor places his order and accepts delivery. Fixtures shall fit exact in the type of ceiling scheduled. Provide plaster frames, trim rings and other accessories required for a correct fit.
 2. Provide supports attached to structural member to support fixtures when the ceiling system cannot maintain support. Provide separate supports for all recessed ceiling mounted HID fixtures.
 3. Refer to architectural reflected ceiling plan for the exact location of all light fixtures. Notify the architect for any discrepancies or conflicts with structural, architectural, mechanical piping or ductwork before installation.
- C. Mounting
 1. Provide support channels to support outlet boxes used support surface mounted light fixtures such as exit signs or downlights.
 2. Pendant or surface mounted fixture shall be provided with required mounting devices and accessories, including hickeys and stud-extensions, ball-aligners, canopies and stems. Locations of fixtures in mechanical areas shall be coordinated with mechanical contractor. Mounting stems of

pendant fixtures shall be of the correct length to uniformly maintain the fixture heights shown on the drawings or established in the field. The allowable variation tolerance in mounting individual fixtures shall not exceed 1/4 inch and shall not vary more than 1/2 inch from the floor mounting height shown on the Drawings. Fixtures hung in continuous runs shall be installed absolutely level and in line with each other. Hanging devices shall comply with Code requirements. Fixtures shall employ single - not twin - stem hangers unless otherwise noted.

3. All structure mounted fixtures (i.e. bracket mounted, pipe mounted and surface mounted) shall be provided with cables of suitable size and weight to support the weight of the fixture. Cables shall be fastened around or fastened to the housing of the fixture. On pendant fixtures, one safety cable of suitable size and weight to support the weight of the fixture assembly shall connect the top of the pendant to the supporting structure by means of welding or bolting, and one safety cable shall connect the housing of the fixture to the bottom of the pendant. Where more than one pendant per fixture occurs, only one pendant must be cabled. Track fixtures for pendant mounted track shall also be supplied with clip-on safety cables of suitable size and weight to support the weight of the fixture.

D. Electrical Connection

1. All light fixtures installed in an accessible suspended ceiling shall be connected from a branch circuit junction box using 1/2" flexible metal conduit or MC cable fixture pigtails not exceeding 8'- 0". All fixtures must be grounded by using a grounding conductor. Fixture to fixture wiring of fixtures installed in an accessible ceiling is not permitted. Fixture whips shall not lay-on ceiling tile or grid. Provide caddy clips to provide additional support.

E. Fire Rated Ceiling

1. Provide fire rated canopy or enclosure for all fixtures recessed in a fire rated ceiling. The fire rated canopy or enclosure shall be as required by the UL design number listed in the UL fire resistance directory. Refer to architectural drawing for the UL design number. Coordinate with ceiling installer and manufacturer.

F. Air Handling Fixtures

1. Install all air handling light fixtures with return air slot in the open position, if it is to be as an air handling fixture. Coordinate with mechanical contractor.

3.02 FINAL INSPECTION

- A. Remove all plastic and protective coating from all fixtures. Fixtures shall be

thoroughly cleaned. Replace any damaged fixture or fixture parts including reflectors, louvers, lens and metal parts that show signs of corrosion.

- B. All final incandescent lamps used during construction shall be replaced with new lamps. Replace all other defective ballast, lamps or discolored lamps, showing signs of excessive usage.
- C. Demonstrate proper operation of all fixtures and controls.

END OF SECTION

SECTION 16721A

FIRE ALARM SYSTEM AND SMOKE DETECTION SYSTEM (SMALL AND MEDIUM ANALOG SYSTEM)

PART 1 - GENERAL

1.01 SCOPE

- A. The contractor shall furnish and install a complete microprocessor based 24VDC, electrically supervised, analog intelligent fire alarm system as specified herein and indicated on the drawings. The system shall include, but not be limited to, all control equipment, power supplies, signal initiating and signaling devices, conduit, wire, fittings, and all other accessories required to provide a complete and operable system.
- B. The system shall operate as a non-coded, continuous sounding system, which will sound alarm devices until manually silenced, as herein specified.
- C. The system shall be wired as a style B and style 4 supervised system for all circuits.

1.02 CODES AND STANDARDS

- A. The system shall comply with the applicable Codes and Standards as follows:
 - 1. National Electrical Code - Article 760.
 - 2. National Fire Protection Association Standards:
 - NFPA 70 NEC
 - NFPA 72 Protective Signaling Systems (current State adopted version)
 - NFPA 90A Air Conditioning
 - NFPA 101 Life Safety Code
 - UL 1971 Visual Devices
 - ANSI 117.1 Visual Devices
 - 3. Local & State Building Codes
 - 4. Requirements of Local Authorities having Jurisdiction. If local authorities design requirements differ substantially from contract drawings, the design engineer shall be notified no less than 10 days prior to bid date, to allow time for addendum to be provided to all contractors. Contractor to provide additional devices as required by local authorities in bid pricing.
 - 5. Underwriters Laboratory Requirements and Listings for use in Fire Protective Signaling Systems as follows:
 - UL 864 Control Panels 9th Edition
 - UL 268 Smoke Detectors - Systems
 - UL 268A Duct Smoke Detectors

UL 521 Heat Detectors
UL 228 Door Holder-Closers
UL 464 Audible Signaling Appliances
UL 1971 Visual Signaling Appliances
UL 38 Manual Alarm Stations

1.03 ACCEPTABLE MANUFACTURERS

- A. To establish the type, quality, and features of system required, the equipment specified is that of the Notifier Fire Systems.
- B. All equipment, materials, accessories, devices, etc. covered by the specifications and/or noted on the contract drawings shall be new and unused and be U.L. listed for their intended use.
- C. All references to manufacturer or supplier's model numbers and other pertinent information herein is intended to establish a minimum standard of quality, performance and features required. All equipment proposed as an EQUAL to that specified shall COMPLETELY conform to the specifications herein.
- D. Equipment of other manufacturer's or supplier's may be considered as an equal to that specified provided that completely marked and identified catalog sheets of all proposed equipment is provided to the architect/ engineer for review ten (10) days prior to the date of bid for evaluation. In addition, a list of the contractor's qualifications and any exceptions to the specifications must be provided for review. Approval for any such substitution of equipment must be obtained in writing from the architect/engineer five (5) days prior to bid.
- E. Provide one of the following manufacturers:
 - 1. Notifier Fire Systems
 - 2. Siemens
 - 3. Edwards System Technology (EST)

1.04 GENERAL REQUIREMENTS

- A. Contractor Qualifications:
 - 1. The equipment supplier shall be an authorized and designated representative of the Fire Alarm Manufacturer to sell, install, and service the proposed manufacturer's equipment.
 - 2. The equipment supplier and installing contractor shall be licensed by the State Fire Marshall to sell, install, and service fire alarm systems as required by Article 5.43-2 of the Texas Insurance Code.
 - 3. The installing contractor and/or equipment supplier shall have on his staff

a minimum of three (3) installation superintendents who are licensed by the State Fire Marshall's office for such purpose and under whose supervision installation, final connections, and check out will take place as required by the Texas Insurance Code.

4. The installing contractor or equipment supplier shall have on staff a minimum of one (1) certified NICET Level III state licensed fire alarm planner under whose supervision system design shall take place.
5. The installing contractor shall provide 24 hour, 365 days per year emergency service with qualified and state licensed service technicians.
6. The installing contractor shall have been actively engaged in the business of selling, installing, and servicing fire alarm systems for at least ten (10) years.

1.05 SUBMITTALS

- A. The installing contractor and/or equipment manufacturer shall provide complete and detailed shop drawings and include:
 1. Control panel configuration including wiring and interconnection schematics.
 2. Complete point to point wiring diagram showing terminal connections to all system devices.
 3. Riser wiring diagram and associated zoning/addressing configurations with associated conduit sizes.
 4. Complete floor plan drawings locating all devices associated with the fire alarm system. Floor plan drawings shall include conduit and wiring routing complete with conduit sizing and number of conductors by type.
 5. Factory data sheets on each piece of equipment to be used and so marked as to model, dimensions, size, voltage, and configuration.
 6. Detailed system description in this specification format describing system functions and operation. All specification variations and deviations shall be clearly noted and marked.
 7. Complete Bill of Material for reference.
 8. Programming matrix defining all input/output functions and zoning.
 9. Power supply and battery calculations.
 10. A letter from the manufacturer stating that the fire alarm system contractor is authorized to sell, service and install the submitted equipment.
- B. All submittal data will be in bound form with contractor's name, supplier's name, project name, and state fire alarm license number adequately identified.
- C. Only basic equipment devices have been shown on the contract drawings. Specific wiring between equipment/devices has not been shown. It is the contractor's responsibility to submit for approval the COMPLETE ENGINEERED system configuration and layout showing all devices, wiring,

conduit, and locations along with other required information as specified herein.

1.06 COORDINATION

- A. It shall be the responsibility of the installing contractor to coordinate all requirements surrounding installation of the fire alarm system with all trades including, but, not exclusive of: electrical contractor, sprinkler contractor, and HVAC/controls contractor and intercom system. Adequate coordination shall be provided to insure proper installation and interface to all peripheral items required to interact with the fire alarm and communication system to provide a complete and functional life safety system.

PART 2 – PRODUCTS

2.01 SYSTEM FUNCTIONAL OPERATION

A. Alarm Detection

1. When a fire alarm condition is detected by any of the system alarm initiating devices, the following functions shall occur:
 - a. The system common alarm LED on the CPU Module shall flash. The internal audible trouble device shall sound. Acknowledgement or silencing the alarm condition shall silence the alarm signals and cause flashing alarm LED's to illuminate steady.
 - b. An 160 character back-lit LCD display shall indicate all applicable information associated with the alarm condition including: zone, device type, divide location, and time of alarm. Location and zoning messages shall be custom field programmed to respective premises.
 - c. Any remote or local annunciator LED's associated with the alarm zone shall be illuminated as herein specified.
 - d. A three channel digital alarm communicator shall be integrally provided and transmit trouble and alarm signals to an approved remote station (remote station connection and service provided by Owner).
 - e. All automatic events programmed to the alarm point shall be executed and the associated indicating devices and/or outputs activated.
 - f. Activate all audible and visual alarm notification devices.
 - g. De-activate HVAC systems over 2000 CFM.
 - h. Display system status changes on the remote annunciator(s).
 - i. Release all smoke doors, fire doors, fire coiling doors, fire smoke dampers and fire shutters.

- j. Recall elevators to ground floor as specified herein, or to the alternate floor if the alarm condition originates on the ground floor. Each elevator lobby shall be provided with a smoke detector. Activation of this smoke detector shall recall the respective elevator cars to the ground floor. In the event of a fire on the ground floor, the elevator cars shall be recalled to level 2.
- k. Printer the status change messages on the system printer.

B. System Trouble Detection

- 1. When a trouble condition is detected by the CPU, one of the system initiating, alarm or SLC circuits, the following functions shall immediately occur:
 - a. The system trouble LED on the CPU module shall flash and the internal audible trouble device shall sound. Acknowledgement of the trouble condition shall silence the audible trouble device and cause all trouble LED's to illuminate steady.
 - b. The 160 character alphanumeric LCD annunciator shall display all applicable information via the alphanumeric display associated with the respective trouble condition and its location.

C. Auxiliary Control

- 1. All designated "non-silenceable" auxiliary control functions shall remain in operation (even upon silencing of audible alarms) until such time as the control panel is cleared and reset manually (i.e. fan control outputs, central station interface, elevator recall interface, etc.).
- 2. Activation of duct smoke detectors associated fans shall shutdown their respective units immediately in addition to identifying the condition as herein specified.

D. System Supervisory Detection

- 1. When a supervisory condition is detected by the fire alarm control panel, the following functions shall occur:
 - a. The fire alarm control panel supervisory indicator shall flash and the internal audible device shall sound. Acknowledgment of the supervisory condition shall silence the audible device and cause the supervisory indicator to illuminate steady.
 - b. The 160 character liquid crystal display shall display all applicable information associated with the respective supervisory condition.
 - c. Activate a supervisory contact closure to interface with the owner provided central station monitoring service.
 - d. Print the status change messages on the system printer.
 - e. Display the system status change on the remote annunciator(s).

E. Fire Drill Control

Provide a fire drill switch located on the Fire Alarm Control Panel. When activated, this switch will activate all horn/strobes and speakers for a fire drill. It shall not release fire shutter, shut down air handling equipment or recall elevators.

If a fire alarm condition is detected, the system shall operate as defined in part 2.01A of this section.

2.02 ZONING

- A. The system shall have the inherent capability to employ "Intelligent" smoke detectors and addressable interface devices capable of being recognized and annunciated at the main control panel on an individual basis. All zoning/device location information shall be totally field programmable to exact job requirements as approved by the Architect/Engineer.

2.03 FIRE ALARM CONTROL PANEL

- A. The fire alarm control panel shall be Notifier series NFS-320. The control panel shall utilize DISTRIBUTED solid state MICROPROCESSORS. The microprocessor based CPU shall be completely FIELD PROGRAMMABLE. CPU module shall provide for programmable non-volatile EEPROM memory. All circuitry shall be U.L. listed for power-limited application. System shall be sized to accommodate the capacity of the system specified and shown on the drawings. System shall be capable of being networked for future expansion.

B. Central Processing Unit Module (CPU)

1. The CPU shall contain and execute all custom time control functions or control-by-event programs for specified events including 'Holiday' exceptions. Time control event/programs shall be automatically overridden by priority fire alarm events. All programs shall be held in non-volatile programmable EEPROM memory, and shall be lost if both system primary and secondary power failure occurs
2. System CPU shall also provide for non-alarm points for non-fire, low priority building functions. The CPU shall provide capability of multi-stage signaling, tornado warning, positive alarm sequencing as well as remote control system operation.

C. Display

1. The DIA shall provide an 160-character backlit, supertwist Liquid Crystal Display (LCD). It shall provide Light-Emitting Diodes (LED's) for AC POWER; SYSTEM ALARM; SYSTEM TROUBLE; SUPERVISORY;

CPU FAIL; and ALARM SILENCED.

2. The display shall provide power to a 21-key membrane keypad with control capability to command all system functions, status readouts, manual control action, and entry of any alphanumeric or numeric information. The keypad shall include means to enter multiple five digit passwords to prevent unauthorized manual control programming.

D. Control Switches

1. Acknowledge/Step Switch
2. Signal Silence Switch
3. Evacuate
4. Lamp Test/Reset

E. System Outputs

1. The system shall provide the following outputs:
 - a. One port for CRT, modem, and/or printer (RS-232c)
 - b. One port for supervised remote LED annunciators (RS-485)
 - c. Four Style Y supervised alarm signaling circuits

F. Loop Interface (SLC)

The CPU shall communicate and provide power to all devices on its loop over a single pair of wires. The CPU shall receive digital/ANALOG information from all "intelligent" detectors and shall process this information to determine normal, alarm, trouble, and sensitivity conditions. The analog information may be used for automatic test and determination of maintenance requirements, and be U.L. listed for such use. The CPU module shall individually monitor all "intelligent" detectors for sensitivity variation initiating a trouble condition should detector sensitivity "drift" become excessive. The system control unit shall have the capability to remotely read each detector's sensitivity in % obscuration, and if need be, electronically adjust the detector sensitivity as required for existing conditions within U.L. recommended limits. In addition, the system shall incorporate a "day/night" sensitivity feature. The system shall provide capability to program each individual detector for multiple 'pre-alarm' conditions. Each 'pre-alarm' level shall be field programmable as a function of the programmed alarm level. The system shall allow designated control-by-event actions to occur as may be required prior to any sensor reaching the designated alarm point.

G. Non-Lock Walk Test

The system shall include a special non-lock "walk test" mode. The walk test mode shall incorporate a one hour time-out feature to return system to normal. Test results shall be capable of being generated and displayed on LCD

annunciator or printed out on system printer.

H. Automatic Detector Test

The system shall include a special automatic detector test feature, which permits reading and adjustment of the sensitivity of all intelligent detectors from the main control panel. In addition, the automatic test feature shall also permit the functional testing of any "intelligent" detector or addressable interface device individually from the main control panel. An automatic detector test shall occur automatically a minimum of every two hour period or be initiated manually from the FACP as desired. Automatic detector test sequencing shall be terminated upon receipt of a true alarm condition.

I. Special System Reports

The system shall have the ability to generate and print, upon command, system and point status reports. Selection of 'system' read status provides the operator with global system programming information as well as providing the operator with all individual point programming data. The system shall also provide the capability to print out a detailed 'history' report from system history file upon command.

J. Field Programming

The system shall be 100% field programmable without the need for external computers or, PROM programmers, and shall NOT require replacement of memory IC's. All programs shall be stored in non-volatile EEPROM memory. Programming shall be accomplished only after entering an appropriate and pre-selected five digit password security code. System programming mode shall NOT require the system to be taken off-line nor prohibit the system from performing its normal operations and routines. The system shall be capable of revising/changing programmed functions or system expansion at any time subsequent to initialization as described herein without factory modifications or factory programming. Field programming via the use of external computers may be considered provided programming can be accomplished on-site and the owner is permanently furnished with the required programming apparatus and software as part of this contract.

K. Event History

The main fire alarm panel shall have the resident ability to store a minimum of 600 system events in chronological order of occurrence. Event history shall include all system alarms, troubles, operator actions, unverified alarms, circuit/point alterations, and component failures. Events shall be time and date stamped. Events shall be stored in non-volatile buffer memory. Access to history

buffer shall be secured via five digit password security code. Systems not employing event history memory storage shall be required to furnish a printer/recorder for recording system events.

L. Power Supply

The power supply shall provide all control panel and peripheral power needs with filtered power as well as rectified 24VDC power for external audio-visual devices.

All power supplies shall be designated to meet UL and NFPA requirements for POWER-LIMITED operation on all external signaling lines, including initiating circuits and indicating circuits.

Input power shall be 120VAC 60Hz. The power supply shall provide internal supervised batteries and automatic charger. The power supply shall provide both positive and negative ground fault supervision, battery/charger fail condition, A.C. power fail indicators. The power supply shall also provide supervision of modular expansion power supplies as may be required.

2.04 FIELD DEVICES

A. Intelligent Photoelectric Smoke Detectors

1. Notifier model FSP-851 analog photoelectric smoke detectors shall be provided where indicated on the drawings. The detectors shall use the photoelectric principle to measure smoke density and shall, on command from the control panel, send data to the panel representing the ANALOG level of smoke density. The detector shall provide automatic sensitivity “drift” compensation. The detector shall also provide a “maintenance alert” feature whereby the detector shall initiate a trouble condition should the unit’s sensitivity approach the outside limits of normal sensitivity window.
2. Each detector shall interface directly to the system SLC loop without the use of zone modules.

B. Intelligent Duct Detector

Notifier model FSD-P series duct mounted “intelligent” **photoelectric** smoke detectors shall be provided where shown on the drawings. Detectors shall operate on the same principles and exhibit the same basic characteristics as area type “intelligent” smoke sensors. The unit shall be capable of interchanging/accepting either photo-electronic or ionization type sensors. The detector shall operate in air velocities of 300 FPM to 4,000 FPM. Each detector shall interface directly to the system SLC loop without the use of zone modules.

The unit shall consist of a clear noryl molded plastic enclosure with integral

conduit knockouts. The unit shall be provided with clear faceplate cover to provide visual viewing of detector/sensor for monitoring sensor operation and chamber condition. The duct housing shall be provided with gasket seals to insure proper seating of the housing to the associated ductwork. Each unit's sampling tubes shall extend the width of the duct and be provided with porosity filters to reduce sensor/chamber contamination. Detectors shall be installed per NFPA 90A, and be listed with the fire alarm control panel. A remote LED shall be located on the corridor ceiling adjacent to the respective detector where detectors are not plainly visible or concealed from view.

C. Intelligent Thermal Detectors

1. Notifier Model FST-751R analog, fixed temperature and rate of rise thermal detectors shall be provided where indicated on the drawings. The detectors shall use dual electronic thermostats to measure temperature levels in the chamber and shall, on command from the control panel, send data to the panel representing the analog temperature level.
2. The detectors shall provide address-setting means on the detector heat using rotary decimal switches. No binary coding shall be required. Systems requiring separate detector programming apparatus will be unacceptable.
3. The detectors shall provide dual alarm and power/status LED's. Status LED's shall flash under normal conditions, indicating that the detector is operational and in regular communication with the control panel. Both LED's may be placed into steady illumination by the control panel, indicating that an alarm condition has been detected. An output connection shall also be provided in the base to connect an external remote alarm LED.
4. The detector shall be semi-flush ceiling mounted and be provided with modular detector head with twist-lock base.
5. Provide weatherproof heat detectors in the Garage Areas.

D. Addressable Manual Stations

1. Notifier Model NBG-12LX manual stations shall be provided where indicated on the drawings. The manual station shall provide address-setting means using rotary decimal switches. No binary coding shall be required.
2. Manual stations shall be designed for semi-flush mounting on standard electrical box. The station shall be constructed of hi-impact red molded Lexan with instructions for station operation in raised white letters. Stations shall be of the dual action type.

E. Monitor Module

1. Notifier model FMM-101 addressable monitor modules shall be provided where required to interface to contact alarm devices. The monitor module shall be used to connect a supervised zone of conventional initiating devices to an intelligent SLC loop.
2. The monitor module shall provide address-setting means using rotary decimal switches. No binary coding shall be required.

F. Control Module

1. Notifier model FCM-1 or FRM-1 control and relay modules shall be provided where required to provide audible alarm interface and/or relay control interface. The control module shall be used to connect a supervised zone of conventional indicating devices to an intelligent loop. The zone may be wired class A or class B - field selected. The control module may be optionally wired as dry contact (form C) relay.
2. The control module shall provide address-setting means using rotary decimal switches. No binary coding shall be required. A status LED shall be provided which shall flash under normal conditions, indicating that the control module is operational and in regular communication with the control panel. The LED shall illuminate steady when the device is actuated via the fire alarm control panel.

G. Electronic Audio Visual Devices

Audible/Visual alarm devices shall be Notifier "P" Series SpectAlert Advance electronic horn/strobe units, to be located where indicated on the drawings. Devices shall be wall or ceiling mounted as indicated on the drawings. AV devices shall be provided with the ability to provide multiple candela settings. Units shall operate at 24VDC and be polarized supervised. Each unit shall provide a choice of three different audible tones capable of being field selected. Preferred alarm signal shall be a temporal tone producing a sound pressure level of 84 dBA. The visual device shall use Xenon strobe type producing a minimum of 15 candela on a 24 VDC limited energy supervised circuit and meet the requirements of ADA and TAS. Strobe unit shall automatically flash upon operation of the horn. Horn/strobe unit shall be provided in textured white finish and be flush mounted.

All visual devices shall be synchronized.

H. Electronic Alarm Horn

Provide Notifier H Series solid state electronic alarm device where indicated on the contract drawings. Units shall operate at 24 VDC and be polarized supervised. Each unit shall provide a choice of three different audible tones capable of being field selected. Preferred alarm signal shall be a temporal tone producing a sound pressure level of 84 dBA.

Units shall be flush mounted and molded of high-impact white plastic.

I. Exterior Audio Visual Devices

All audio visual devices located outside or labeled weatherproof shall be weatherproof. Provide the following devices:

1. SpectAlert Advance “PK” Series for audio/visual devices.
2. SpectAlert Advance for “SK” Series for visual devices

All devices shall be provided with a weather proof type back box.

J. High Intensity Visual Signals

Provide a Notifier “S” Series SpectAlert Advance visual signal device. High intensity visual signals shall be installed where shown on the drawings and as may be required by the Americans with Disabilities Act (Public Law 101-336) and TAS.

High intensity visual alarms shall be Xenon strobe type producing a minimum of 15 candela on a 24 VDC limited energy supervised circuit. Alarm devices shall be designated to be wall or ceiling mounted as indicated on the drawings. Signals shall operate in unison with audible alarm appliances. All visual devices shall be synchronized.

Units shall be flush mounted and shall be provided in textured white.

K. Auxiliary AHU Relays

Notifier/Air Products model MR-101/C relays or approved equal shall be provided for HVAC and AHU control and interface. Relays shall be heavy duty type and rated up to 10 amps at 24 VDC, 60 HZ. Relays shall be provided with NEMA I dust cover assembly and be provided with SPDT contacts as well as (fail safe) so that if the cable is broken, disconnected etc., the AHU will automatically shutdown.

L. Field Charging Power Supplies

Provide Notifier FCPS-24 power supplies with battery backup as required. Provide 120 volts dedicated circuit to each power supply.

M. Remote LCD Alpha-Numeric Annunciators

Provide where indicated on the drawings, a Notifier FDU-80 remote LCD alpha-

numeric annunciator to annunciate all system events and duplicate the displayed status at the main FACP. The annunciator shall be a backlit eighty-character LCD display and operate via the system RS485 and RS232 serial output terminal from main FACP. The LCD display shall automatically illuminate upon receipt of an alarm or trouble condition. The illuminary source shall extinguish during normal/standby model to conserve power. The unit shall operate from FACP 24VDC power and function during system power failure while the system resides on standby batteries. The remote LCD annunciator shall include:

- Integral time-date clock
- Time-date select clock
- Time-date/contrast adjust
- Display/step switch
- System reset
- System silence
- System acknowledge
- Integral trouble buzzer

Annunciator shall upon command display the first system alarm, last alarm, and system alarm count. The unit shall be equipped with an integral lamp test feature. The unit shall be semi flush mounted where shown.

N. Protective Covers

Provide protective covers on all fire alarm devices located in student restrooms, corridors and in the cafeteria. These protective covers shall be manufactured by Safety Technology International, Inc. (STI). These covers shall be provided on all devices including but not limited to smoke detectors, heat detectors, audible and visual devices, pull stations, etc. The mounting of a device shall be reinforced to enable the protective covers to protect the fire alarm devices.

O. Speakers/Strobes (Cafeteria)

Speakers shall be listed under U.L. Standard 1480, meet all specifications of the Life Safety Code, and be capable of reproducing both tone alerts and voice communication instructions. Speaker/strobes shall be Gentex #SPK4-110-1-B. Speakers or approved equal shall have built in matching transformer, field selectable multiple power taps and circuitry for speaker/line supervision. Speakers shall be provided with screw terminal connection points.

Speakers shall be 4" square with textured white decorative metal grill. Speakers shall be tapped to produce a minimum sound-pressure level of 87 dBA at 10 feet. Speakers shall be wall mounted and located as located on the drawings. Strobes shall be 110 candela.

P. Remote Paging Panel (Cafeteria)

Provide an Audiosone VEC-1 remote paging panel where indicated on drawings. Panel shall be sized to provide two watts per speaker plus 20% spare capacity.

Panel shall be provided with a standard pre-recorded voice message and be interfaced with the fire alarm system.

Q. Speakers (Wet or Damp Locations)

Speakers shall be listed under U.L. Standard 1480, meet all specifications of the Life Safety Code, and be capable of reproducing both tone alerts and voice communication instructions. Speakers shall be System Sensor SPK Series. Speakers or approved equal shall have built in matching transformer, field selectable multiple power taps and circuitry for speaker/line supervision. Speakers shall be provided with screw terminal connection points.

Speakers shall be 4" square with textured white decorative metal grill. Speakers shall be tapped to produce a minimum sound-pressure level of 87 dBA at 10 feet. Speakers shall be wall mounted and located as located on the drawings. Speakers and back boxes shall be weather proof.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Wiring:

1. All wiring shall be in accordance with NFPA 72 and the National Electrical Code, Local Codes, and article 760 of NFPA Standard 70. All wiring sizes shall conform to recommendations of the equipment manufacturer, and as indicated on the engineered shop drawings.
2. All wire shall be U.L. Listed, limited energy (300 volt) FPLP or MPP wire and shall be run open in return air ceiling plenums. The wire shall be listed to U.L. TEST 910 for such applications and is of the low smoke producing fluorocarbon type and complies with NEC Article 760 if so approved by the local authority having jurisdiction. Provide conduit in all inaccessible locations, inside concealed wall, all mechanical/electrical rooms, or other areas where wiring might be exposed and subject to damage.
3. Support wire clear of knock out panels, access panels, and maintenance spaces for equipment. Wire and cable shall be run using wire management techniques supporting cable as close as possible to within one foot of the floor or roof rafters. Wire supports shall be directly fastened to the structure on a maximum of five foot centers. Wire routing shall be parallel and perpendicular to building lines. The wire and cable shall be secured with tie wraps or carrier wire. Sagging in excess of three inches will not be allowed nor will bending of the supporting ring structure.
4. All wiring for SLC signaling circuits shall be of the twisted low capacitance type to guard against outside RF and EMF interference and

induced noise.

5. All wiring shall be run in a supervised fashion (i.e. no branch wiring or dog-legged wiring) per NFPA requirements such that any wiring disarrangement will initiate the appropriate trouble signals via the main control panel per NFPA and U.L. requirements.
6. Wiring splices shall be kept to a minimum with required splices to be made in designated terminal boxes or at field device junction boxes. Transposing or color code changes of wiring will not be permitted. End-of-line supervisory devices shall be installed with the last device on the respective circuit. Said device shall be appropriately marked designating it as the terminating device on the respective circuit.
7. No A.C. wiring or any other wiring shall be run in the same conduit as fire alarm wiring.

B. Conduit/Raceway

1. All wire shall be installed in an approved conduit/raceway system (except where permitted by NEC and the local authority having jurisdiction). Maximum conduit "fill" shall not exceed 40% per NEC.
2. Conduit and raceway system shall be installed as specified under the general electrical section of the specifications, and per NEC.
3. Minimum conduit size shall be 3/4" EMT. Install conduit per engineered shop drawings.

C. Minimum Wire Sizes Shall Be As Follows:

1. Signaling Line Circuit: 18 AWG
2. Notification Appliance Circuit: 14 AWG
3. Relay Control Circuits: 18 AWG

D. Sprinkler Valves

1. Contractor shall connect all tamper switches and post indicator valves to the supervisory circuit. Connect all water flow switches to the alarm circuit. Coordinate exact locations of water vaults valves and flow switches with sprinkler contractor.

3.02 NOTIFICATION APPLIANCE CIRCUITS SYNCHRONIZATION

- A. All visual and audible devices shall be synchronized per the current state adopted version of NFPA 72. Provide all components required.

3.03 TEST AND REPORTS

- A. A state licensed factory trained technical representative of the manufacturer shall

perform the final control panel connections and supervise testing of the system and it shall be subject to the approval of the responsible engineer and owner. Upon completion of the acceptance tests, the owner and/or his representatives shall be instructed in the proper operation of the system.

- B. The installing contractor shall functionally test each and every device in the entire system for proper operation and response. In addition, each circuit in the system shall be fully tested for wiring supervision to insure proper wiring installation. Any items found not properly installed or non-functioning shall be replaced or repaired and re-tested. All testing shall be supervised by a licensed fire alarm superintendent.
- C. The installing contractor shall provide a complete written report on the functional test of the entire system. The test and report shall verify the function of each device in the system, operation of all auxiliary control functions, and the proper operation of the main fire alarm control panel. A copy of the test report shall be provided with maintenance manuals. The test report shall be signed and dated by the licensed fire alarm superintendent responsible for supervising the final system test and checkout.
- D. The installing contractor's fire alarm superintendent shall test the entire system in the presence of the local authorities having jurisdiction.

3.03 SPARE DEVICES

- A. Provide 5% spare field devices including labor to install them. Devices not used shall be given to the Owner at completion of the job.

3.04 WARRANTY

- A. The fire alarm system shall be free from defects in workmanship and materials, under normal use and service, for a period of one year from the date of acceptance or beneficial occupancy, whichever shall occur first. Any equipment shown to be defective shall be repaired, replaced or adjusted during normal working hours at no cost to the owner.

3.05 GRAPHIC FLOOR PLANS

- A. Provide 1/16" = 1'-0" floor plan showing all devices and zoning. Zoning shall correspond to the zone on the fire alarm control panel. The floor plans shall be framed with a glass cover and located by the fire alarm control panel. This graphic floor plan shall use the actual room numbers based on the architectural graphics package. Verify specific requirements with Owner. Provide a sample for approval.

END OF SECTION

SECTION 16930

MISCELLANEOUS ELECTRICAL CONTROLS AND WIRING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

1.02 SCOPE

- A. Provide the various miscellaneous control devices, wiring and additional branch circuits as required, shown and specified.
- B. The types of miscellaneous control devices and wiring include but not limited to the following.
 - 1. Contactors
 - 2. Relays
 - 3. Photocells
 - 4. Time switches
 - 5. Additional control wiring and safety devices as shown and specified.
 - 6. Connect power from fire alarm relays to starters to shut down air handling units.
- C. **WORK SPECIFIED ELSEWHERE:**
 - 1. Various control devices, of an electrical nature, for the safe operation and temperature control of the heating, ventilating, air conditioning and plumbing systems provided under Division 15.
 - 2. All control wiring and conduit shall be furnished under Division 15. All power wiring 120 volt or larger shall be provided by Division 16.
 - 3. Refer to building controls specification, Division 15 for scope of work required to be performed by Division 16 (electrical contractor).

1.03 REQUIREMENTS OF REGULATORY AGENCIES

- A. **WORK IN ACCORDANCE WITH:**
 - 1. National Electrical Code.
 - 2. Local municipal or state codes that have jurisdiction.

1.04 ACCEPTABLE MANUFACTURERS

- A. Provide one of the following manufacturers:
1. LIGHTING CONTACTORS AND RELAYS
 - a. General Electric
 - b. Square D Company
 - c. Automatic Switch Company
 2. PHOTOCELLS AND TIME SWITCHES
 - a. Tork, Inc.
 - b. Intermatic time controls
 - c. AMF paragon

PART 2 - PRODUCTS

2.01 MATERIAL

- A. GENERAL: This Section shall outline the basic installation of electric devices, conduit, boxes, fittings, and wiring required for complete interconnection of several systems, this may not reflect every required appurtenance. It does not cover integral parts of mechanical equipment.
- B. CONTACTORS AND RELAYS: Provide control wiring, contactors, and relays with the ampere-rating and number of poles as shown, specified, and required for a complete and functioning system:
1. Rated at 600 volts, 60 hertz.
 2. Continuously rated contacts for all types of ballast and tungsten lighting, resistance and motor loads. Contacts shall be sized as scheduled or noted.
 3. Shall have totally enclosed, double-break silver-cadmium-oxide power contacts. Auxiliary arcing contacts are not acceptable. Contact inspection and replacement shall be possible without disturbing line or load wiring.
 4. The contactor shall have straight-through wiring with all terminals clearly marked.
 5. The contactor shall be approved per UL508 and/or CSA, and be designed in accordance with NEMA ICS2-21 1B.
 6. They shall be industrial-duty rated for applications to 600 volts maximum.
 7. The contactor shall have provisions for factory or field addition of:
 - a. Four (4) N.O. or N.C. auxiliary contacts rated 6 amperes continuous at 600 volts.
 - b. Single or double circuit, N.O. or N.C., 30 or 60 ampere 600 volt power-pole adder.
 8. The contactor shall have a NEMA type 1 enclosure unless otherwise noted.
 9. Control power to the contactor 120V control circuit shall be provided from

the nearest panelboard 120V circuit. If the 120V control power circuit is not shown, provide a control power transformer for 120 volt control power and a 120 volt coil when required for control. Provide primary and secondary fuses on the control power transformer.

10. Electrically Held Lighting - Contactor coils shall be continuously rated and encapsulated. Electrically held contactors are not to be used unless specifically shown on the plans.
 11. Mechanically Held Lighting Contactors - Coil-clearing contacts shall be supplied so that the contactor coils shall be energized only during the instance of operation. Both latch and unlatch coils shall be encapsulated. All contactors shall be mechanically held unless noted otherwise on the plans.
 12. Provide 2-wire or 3-wire control modules as required to operate lighting contactors.
 13. Provide hand-off-automatic controls (H-O-A) for each lighting contractor.
 14. Provide relays and contactors to shut down air handling units.
- C. Photocells: Provide a specification grade self contained, weatherproof, photoelectric control that shall be mounted on an FS type weatherproof junction box. The photocell shall:
1. Switch "ON" at dusk and "OFF" at dawn.
 2. Adjustable from 2 to 50 foot candles.
 3. Rated at 2000 watts.
 4. Use 1" diameter cadmium sulphide cell.
 5. Have a 2 minute delay to prevent false switching.
- D. TIME SWITCHES: Provide a 7-day digital time clock with battery back-up feature installed in a NEMA 3R enclosure.
- E. Control wiring shall be not less than #14 AWG type TW, and shall be color coded and labeled with Brady markers throughout. Bundle multiple conductors with Ty-Raps.

PART 3 - EXECUTION

3.01 Install miscellaneous electrical controls and wiring to provide a functioning system.

3.02 H.V.A.C. AND PLUMBING CONTROL

- A. Install electrical devices not an integral part of mechanical equipment providing conduit, boxes, fittings, wiring, and other devices.
- B. Electrical contractor is responsible for providing all line voltage power to devices indicated by controls contractor that require electrical power to operate. Electrical

contractor shall terminate line voltage power to termination points indicated by control contractor. Electrical contractor shall coordinate with controls contractor to determine sizing and quantities of line voltage circuits to adequately power control devices. Electrician is to obtain circuits from nearest low voltage panel using spare circuits provided, if device requires power not already available.

- 3.03 Install contactor and relays in electrical/mechanical rooms unless otherwise noted.
- 3.04 Install photocells on the roof unless otherwise directed by the architect. Coordinate any roof penetrations with all other trades and shield from other light sources.
- 3.05 Provide miscellaneous connections for signs and other furnished equipment as shown on the Drawings.

END OF SECTION