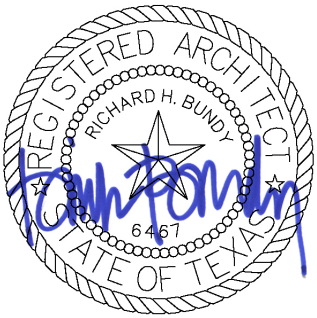
PROJECT MANUAL WITH SPECIFICATIONS
OF THE CONTRACT DOCUMENTS

FOR THE:

SUNWATCHER CLUBHOUSE RENOVATIONS
FOR:

MIDWESTERN STATE UNIVERSITY
WICHITA FALLS, TEXAS



10-13-2017

BYSP PROJECT NO. 17032

SET NO._____

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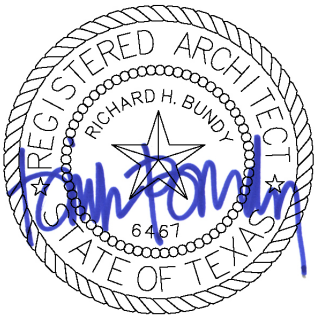

PROJECT MANUAL Oct. 13, 2017

REQUEST FOR PROPOSAL
MIDWESTERN STATE UNIVERSITY
PURCHASING DEPARTMENT
3410 Taft Blvd., Daniel Bldg., Rm. 202
Wichita Falls, Texas 76308

BID NUMBER	BID TITLE
#735-18-8188	**Sunwatcher Clubhouse Renovations**

SEALED BIDS WILL BE RECEIVED UNTIL:
Tuesday November 14, 2017 – 2:00pm

At the office of the Director of Purchasing,
3410 Taft Blvd., Daniel Bldg., Rm. 202
Wichita Falls, Texas 76308

GENERAL TERMS AND CONDITIONS

These General Terms and Conditions apply to all offers made to Midwestern State University (herein after referred to as "University") by all prospective vendors (hereby after referred to as "Bidders") on behalf of Solicitations including, but not limited to, Invitations to Bid and Request for Quotes.

INSTRUCTIONS FOR SUBMITTING BIDS

Review this document in its entirety. Be sure your bid is complete, and double check your bid for accuracy.

Questions requiring only clarification of instructions or specifications will be handled verbally. If any questions results in a change or addition to this Bid, the change(s) and addition(s) will be forwarded to all vendors involved as quickly as possible in the form of the addendum.

Sign the **Vendor's Affidavit Notice** and return with your bid.

BIDDERS SHALL SUBMIT (1) ORIGINAL AND THREE (3) COPIES OF BID ON THE FORM PROVIDED, SIGN THE VENDOR AFFIDAVIT, AND RETURN ENTIRE BID PACKET. In the event of inclement weather and the University Offices are closed on a bid opening day, bids will be received until 2:00 p.m. of the next business day. At which time said bids will be privately opened.

BIDS SUBMITTED AFTER THE SUBMISSION DEADLINE SHALL BE RETURNED UPOPENED AND WILL BE CONSIDERED VOID AND UNACCEPTABLE.

SUCCESSFUL VENDOR WILL BE NOTIFIED BY MAIL. All responding vendors will receive written notification regarding the outcome of the award.

PLEASE NOTE CAREFULLY

THIS IS THE ONLY APPROVED INSTRUCTION FOR USE ON YOUR BID. ITEMS BELOW APPLY TO AND BECOME PART OF TERMS AND CONDITIONS OF BID. ANY EXCEPTIONS THERETO MUST BE IN WRITING.

1. Each bid shall be placed in a separate envelope completely and properly identified with the name and number of bid. Bids must be in the Purchasing Office **BEFORE** the hour and date specified.

2. QUOTE F.O.B. DESTINATION. If otherwise, show exact cost to deliver. Bid unit price on quantity specified - extend and shoe total. In case of errors in extension, UNIT prices shall govern. Bids subject to unlimited price increase will not be considered.

3. Bids MUST give full firm name and address of the bidder. Failure to manually sign bid will disqualify it. Person signing bid should show TITLE or AUTHORITY TO BIND HIS FIRM IN A CONTRACT.

4. Bids CANNOT be altered or amended after opening time. Any alterations made before opening time must be initialed by bidder or his authorized agent. No bid can be withdrawn after opening without the approval by the Vice-President of Administration & Finance based on a written acceptable reason.

5. The University is exempt from State Sales Tax and Federal Excise Tax. **DO NOT INCLUDE TAX IN BID.**

6. Any catalog, brand name or manufacturer's reference used in a bid invitation is descriptive- NOT restrictive- it is to indicate type and quality desired. Bids on brand of like nature and quality will be considered. If bid is based on other than referenced specifications, proposal must show manufacturer, brand or trade name, lot number, etc., of article offered. If other than brand(s) specified is offered, illustrations and complete description should be made part of the bid. If bidder takes no exception to specifications or reference data, he will be required to furnish brand names, numbers, etc., as specified.

7. Samples, when requested, must be furnished free of expense to the University. If not destroyed in examination, they will be returned to the bidder on request, at his expense. Each sample should be marked with bidder's name, address, and University bid number. **DO NOT ENCLOSE OR ATTACH SAMPLE TO BID.**

8. **Delivery:** Bid must show number of days required to make delivery to place material in receiving agency's designated location under normal conditions. Failure to state delivery time obligates bidder to complete delivery in 14 calendar days. A five-day difference in delivery promise may break a tie. Unrealistically short or long delivery promises may cause bid to be disregarded. Consistent failure to meet delivery promises without valid reason may cause removal from bidder list.

9. If delay is foreseen, contractor shall give written notice to Director of Purchasing. The University has the right to extend delivery date if reasons appear valid. Contractor must keep University advised at all times of status of order. Default in promised delivery (without accepted reasons) or failure to meet specifications, authorizes the University to purchase supplies elsewhere and charge full increase in cost and handling to defaulting contractor.

10. All items proposed shall be new, in first class condition suitable for shipment and storage (Midwestern State University prefers recycled packaging whenever possible), unless otherwise indicated in bid. Verbal agreements to the University will not be recognized. All materials and services shall be subject to Purchaser's approval. Unsatisfactory materials will be returned at Seller's expense.

11. Written and verbal inquiries pertaining to bids must give Bid Number and Commodity.

12. No substitutions or cancellations permitted without written approval of Director of Purchasing.

13. The University reserves the right to accept or reject all or any part of any bid, waive minor technicalities and award and award to the Bidder that bids to the Best Value to the University. The University reserves the right to award by item or by total bid. Prices should be itemized.

14. Delivery shall be made during normal working hours only, 8:00a.m. to 5:00p.m., unless prior approval for late delivery has been obtained from the Director of Purchasing.

15. Consistent and continued tie bidding could cause rejections of bids by the University and/or investigation for Anti-Trust violations.

16. The contractor agrees to protect the University from claims involving infringement of patents or copyrights.

17. This is a Quotation inquiry only and implies no obligations on the part of the University.

18. Acceptance of and final payment for the item will be contingent upon satisfactory performance of the product received by the University.

19. **Award:** A written purchase order or notice of award mailed or otherwise furnished to the successful bidder within the time of acceptance specified in this package results in a binding contract without further action by either party.

20. **Variation in Quantity:** The University assumes no liability for commodities produced, processed or shipped in excess of the amount specified herein.

21. **Invoicing:** Bidder shall submit two (2) copies of an itemized invoice shoeing bid number and purchase order number to:

Midwestern State University
Accounts Payable
3410 Taft Blvd.
Wichita Falls, Texas 76308

22. **Payments:** The University, after receipt of completed order will make payment to the contractor within 30 days from the receipt of goods or invoice whichever is later. All partial shipment must be pre-approved by the Director of Business Service. In the event of partial shipments the University is not required to make payments until the order is complete.

23. Discrimination: In order to comply with the provisions of fair employment practices, the contractor agrees as follows; 1) the contractor will not discriminate against any employee or applicant for employment because of race, sex, religion, handicap, or national origin; 2) in all solicitations or advertisements for employees, the contractor will state that all qualified applicants will receive consideration without regard to race, color, sex, age, religion, handicap, or national origin; 3) the contractor will furnish such relevant information and reports as requested by the University for the purpose of determining compliance with these regulations; 4) failure of the contractor to comply with these laws will be deemed a breach of contract and it may be cancelled, terminated or suspended in whole or in part.

24. **Assignment:** Any contract entered into pursuant to this request is not assignable, not the duties thereunder, by either party without the written consent of the other party in the contract.

25. **Other Remedies:** In addition to the remedies stated herein, the University has the right to pursue other remedies permitted by law or in equity.

26. All costs quotations must include all the various features needed to satisfy the requirements. Note: No amounts will be paid for the items in this BID in excess of the amounts quoted.

REQUEST FOR PROPOSAL

SUNWATCHER CLUBHOUSE RENOVATIONS FOR:
MIDWESTERN STATE UNIVERSITY

It is the intent of these specifications to describe the minimum requirements for the above titled project at Midwestern State University in sufficient detail to secure comparable bids.

This is a one-time purchase of this replacement at Midwestern State University.

Each bidder must confirm he fully understands these specifications and the University's needs and satisfies himself that he is cognizant of all factors relating to requirements contained in these specifications.

The bid analysis will include compliance to bid specifications, past performance with vendor, references, delivery time, which will have a weighted average of 30 percent and the overall cost to the university, which will have a weighted average of 70 percent. Midwestern State University reserves the right to consider deviations from these specifications.

Award of this bid will be contingent on availability of Midwestern State University.

References shall be included on this bid form. Three current customers with a comparable purchase shall be listed with complete name, address, telephone number and contact person.

Bids must be submitted on this form and the bidder shall return the entire bid/specification package which will constitute a contract equally binding between the bidder and Midwestern State University if bids accepted by the University. Each bid shall be placed in a sealed envelope, manually signed in ink by a person having the authority to bind his firm in a contract.

This contract shall remain in effect until completion and acceptance by the University. Midwestern State University reserves the right to enforce the performance of this contract in any manner prescribed by law or deemed to be in the best interest of the University in the event of breach or default of this contract. Midwestern State University reserves the right to terminate the contract immediately in the event the successful bidder fails to make delivery in accordance with the specifications.

Questions concerning these specifications should be directed in writing to:

Stephen Shelley, Director of Purchasing
3410 Taft Blvd., Daniel Bldg., Rm. 202
Wichita Falls, Texas 76308
Email: Stephen.shelley@mwsu.edu
(940) 397-4110

Questions should be received no later than **2:00 pm November 6, 2017**. No questions will be allowed after this date.

All bids meeting the intent of this proposal will be considered for award. Bidders taking exception to the specifications, or offering substitutions, shall state these exceptions in the section provided or by attachment as part of the bid. The absence of such a list shall indicate that the bidder has not taken exception and shall hold the bidder responsible to perform in strict accordance with the specifications of the invitation. Midwestern State University reserves the right to accept any and all or none of the exception(s) / substation(s) deemed to be in the best interest of the University.

No money will be paid to the vendor until acceptance of the printed material or the fulfillment of the purchase obligation to the University.

PRE-BID MEETING: A pre-bid meeting will be held at 1:30 am on Friday, November 3, 2017 in the Sunwatcher Clubhouse Lobby on the campus of MSU.

SPECIFICATIONS:

The apparent silence of the specifications as to any detail or to the apparent omission from it of a detailed description concerning any point, shall be regarded as meaning that only the best commercial practices are to prevail. All interpretations of these specifications shall be made on the basis of this statement.

The University reserves the right to reject any and all bids if deemed to be in the best interest of the University.

SCOPE OF WORK
MSU SUNWATCHER CLUBHOUSE RENOVATIONS

Specifications are per BYSParchitects # 17032.
ARCHITECT:
BYSParchitects
1005 9th Street- Suite 200
Wichita Falls, Texas 76301
Telephone: (940) 761-2404

This project consists of furnishing all labor and materials, equipment, and building systems for the General Building Construction for an overall project consisting of the Renovations to the Sunwatcher Clubhouse at Midwestern State University.

The general building construction work includes: Layout, construction, and Architectural finishing as required by plans and specifications of the renovations to parts of the existing facility.

Plans and Project Manual with Specifications may be examined at the office of the Director of Purchasing at Midwestern State University.

MCGRAW HILL DODGE PLAN ROOM
9155 Sterling Dr.- Suite #160
Irving, Texas 75063

Plans and Project Manual with Specifications may be obtained by Bonafide Bidders from the office of the Director of Purchasing at Midwestern State University upon payment of a $100.00 deposit for each set of documents in accordance with the Instructions to Bidders.

Proposal Guaranty in the amount of 5% of the Base Proposal in the form of Cashier's Check, Certified Check or Bid Bond shall accompany the proposal: made payable unconditionally to Midwestern State University.

The successful bidder will be required to furnish the Performance Bond and Payment Bond, each in the amount of the Contract written by a responsible surety company authorized to do business in the State of Texas, as required by Article 5160, Revised Civil Statutes of Texas. He will also be required to furnish an insurance certificate showing the he has all the insurance required by the Contract Documents.

The Owner reserves the right to reject any and all bids and to waive any irregularities.

All respondents must complete and submit a State of Texas HUB Subcontracting Plan with their response to the bid solicitation. A HUB Subcontracting Plan is attached and must be submitted with Bid.

The 2010 Uniform General Conditions and the Special Conditions will be applied as part of contract documents.

A sample of the contract that will be used is attached for your review. Questions should be addressed during the bidding process for the usage of this contract.

BID PROPOSAL FORM
RFP # _____
Sunwatcher Clubhouse Renovations

Date:_____

Proposal of _____ Hereinafter called "Bidder" as corporation, organized and existing under the laws of the State of _____, a partnership, or an individual (Omit all that are not applicable) doing business as

_____
_____

TO: Midwestern State University
3410 Taft Blvd.
Wichita Falls, Texas 76310

Gentlemen:

The Bidder, in compliance with your invitation for bids for the Sunwatcher Clubhouse Renovations at Midwestern State University, Wichita Falls, Wichita County, Texas, having examined the plans and specifications with related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project, including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies, and to construct the project in accordance with the Contract Documents, within the time set forth therein, and at prices stated below. These prices are to cover all expenses incurred in performing the work required under the Contract Documents, of which this proposal is a part.

Bidder hereby agrees to commence work under this contract on or before _____, 2017 which is to be specified in written "Notice to Proceed" by the Owner and it is the intent of the Owner to have the project complete by _____, 2018. Contractor is to have access to the site on _____ to begin construction.

Bidder hereby acknowledges receipt of the following addenda by number.

_____

_____

BASE PROPOSAL:

Bidder agrees to perform all of the Work as described in the Proposal and the Specifications and as shown on the plans within forty-five (45) consecutive calendar days making a completion date of _____, for the sum of _____ _____Dollars ($_____). Amount shall be shown in both words and figures and in case of discrepancy the amount shown in words shall govern.

ALTERNATE PROPOSALS:

Bidder hereby offers for consideration of the Owner a revised time schedule for the work as an alternative to that required by the Proposal.

ADDITIVE ALTERNATE NO. 1:

Replace the existing East and West entrances to the Sunwatcher Clubhouse with commercial aluminum and glass entrances as shown and specified on the drawings for _____ _____ Dollars ($_____).

PERFORMANCE AND PAYMENT BONDS

It is understood that a bond in 100% of the contract amount, covering faithful performance of the Contract and Payment of all obligations arising thereunder will be required by the Owner. Premiums for the Performance and Payment Bonds are included in this Proposal.

Upon receipt of written notice of the acceptance of this bid, Bidder will execute formal contract attached within 10 days and deliver a Surety Bond or Bonds in accordance with the General Conditions and the Invitation and Instruction to Bidders.

BID SECURITY

The bid security attached in the form of Cashier's Check, Certified Check or Bid Bond (as applicable) is to become the property of the Owner in the event the contract and bond are not executed within the time above set forth, as liquidated damages for the delay additional expense to the Owner caused thereby. The bidder's check or bond will be returned to the bidder, except in the event of the Owner's acceptance of this Proposal, the bidder fails to execute the Contract and file Performance and Payment Bonds.

BID PROCEDURES

Bidder understands that the Owner reserves the right to reject any or all bids, to waive any informalities, and irregularities in the bidding; or to accept any bid considered advantageous.

The Bidder agrees that this bid shall be good and may not be withdrawn for a period of 60 calendar days after the scheduled closing time for receiving bids.

Respectfully submitted

BY: _____

_____

(Title)

_____

(Business Address)

(Seal if bid is by a corporation)

BID SECURITY BOND

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

_____ as Principal,

and_____ as Surety, are hereby held and firmly bound unto Midwestern State University, Wichita Falls, Texas as Owner in the penal sum of 5% of the base bid for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns. Signed this _____ day of _____, 2017.

The condition of the above obligation is such that whereas the Principal has submitted to Midwestern State University a certain Proposal, attached hereto and hereby made a part hereof to enter into a contract in writing, for the Sunwatcher Clubhouse Renovations at Midwestern State University, Wichita Falls, Wichita County, Texas.

BYSParchitects

Project No. 17032

NOW THEREFORE,

(a) If said Proposal shall be rejected, or in the alternate,

(b) If said Proposal shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract (Properly completed in accordance with said Bid) and shall furnish a bond for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bid, then this obligation shall be void, otherwise the same shall remain in force and effect; if being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

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

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

SEAL

_____
(Principal)

_____
(Surety)

BY: _____

A copy of this form or a reasonable facsimile thereof is to be used by Bidders.

AIA DOCUMENT A101 - 2007 EDITION

STANDARD FORM OF AGREEMENT BETWEEN

OWNER AND CONTRACTOR

where the basis of payment is a

STIPULATED SUM

2007 Edition with 7 pages and Ten Articles will be used for the Form of Contract.

The following conditions will be incorporated by reference into the Agreement:

(1) Provisions for Retainage as specified in the Amendments and Supplementary General Conditions, to include:

(2) Payment of Remaining Retained Percentage 30 days following Final Completion.

PERFORMANCE BOND

THE STATE OF _____

COUNTY OF _____

KNOW ALL MEN BY THESE PRESENTS: That we, (1) _____

_____ _____ and (2)

_____ as Principal, hereinafter called

Contractor, and (3)_____ as Surety, hereinafter called Surety, are held and firmly bound

unto_____

County of _____, _____

as Obligee, herein after called Owner, in the amount of_____ Dollars

($_____) for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS,

Contractor has by written agreement dated _____, 2017 entered into a contract with Owner for the Sunwatcher Clubhouse Renovations at Midwestern State University, Wichita Falls, Wichita County, Texas (herein called the "Work") in accordance with drawings and specifications prepared by BYSParchitects, 1005 Ninth Street - Suite 200, Wichita Falls, Texas 76301, which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

Footnotes: ----------

(1) Correct name of Contractor

(2) A corporation, a partnership, or an individual, as case may be

(3) Correct name of Surety

NOW THEREFORE, if the Principal shall well, truly and faithfully perform the work in accordance with the plans, specifications and contract documents during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED HOWEVER, that this bond is executed pursuant to the provisions of Article 5160 of the Revised Civil Statutes of Texas as amended by Acts of the 56th Legislature, 1959, and all liabilities on this bond: determined in accordance with the provisions of said Article to the same extent as if it were copied at length herein.

PROVIDED FURTHER, that if any legal action be filed upon this bond, venue shall lie in Wichita County, State of Texas, and that the said surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work or to the specifications.

IN WITNESS WHEREOF, this instrument is executed in six counterparts, each one of which shall be deemed an original, this the _____ day of _____ A.D., 2017.

ATTEST:

_____
Principal

By: _____

_____
Address

(SEAL)

_____
Witness to Principal

_____
Address

(SEAL)

_____
Witness as to Surety

_____
Address

_____
Surety

_____

_____
Address

PAYMENT BOND

THE STATE OF _____

COUNTY OF _____

KNOW ALL MEN BY THESE PRESENTS: that we, (1) _____

_____ _____

as Principal, hereinafter called Principal, and

(2)_____ _____ as Surety,

hereinafter called Surety, are held and firmly bound unto_____

_____

County_____, _____

as Obligee, hereinafter called Owner, for the use and benefit of claimants as herein below defined, in the amount of _____

Dollars ($ _____) for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, _____ ____

Principal has by written agreement dated _____, 2017 entered into a contract with Obligee for the Sunwatcher Clubhouse Renovations at Midwestern State University, Wichita Falls, Wichita County, Texas, in accordance with drawings and specifications prepared by BYSParchitects, 1005 Ninth Street - Suite 200, Wichita Falls, Texas 76301, which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

Footnotes----------

(1) Correct name of contractor

(2) Correct name of Surety

NOW THEREFORE, the condition of this obligation is such that, if the said Principal shall promptly make payment to all claimants as defined in Article 5160 of the Revised Civil Statutes of Texas, as amended by the Acts of the 56th Legislature, 1959, supplying labor and materials in the prosecution of the work provided for in said Contract, then 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 materials in the prosecution of the work provided for in said Contract, and all such claimants shall have a direct right of action under the bond as provided in Article 5160, Revised Civil Statutes 1925, as amended by House Bill 344, Acts of 56th Legislature, Regular Session, 1959.

PROVIDED FURTHER, that if any legal action be filed upon this bond, venue shall lie in Wichita County, State of Texas, and that the said surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work or to the specifications.

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

IN WITNESS WHEREOF, this instrument is executed in six counterparts, each one of which shall be deemed an original, this the _____ day of _____, A.D., 2017.

ATTEST:

_____
Principal

_____
(SEAL) BY: _____

_____
Address

_____
Witness as to Principal

_____
Address

ATTEST:

_____
Surety

_____
(SEAL)

BY: _____

_____ _____
Witness as to Surety Address

_____
Address

Footnote: If Contractor is Partnership, all partners should execute bond.

CERTIFICATE OF INSURANCE FORM

For the Sunwatcher Clubhouse Renovations at Midwestern State University, Wichita Falls, Wichita County, Texas.

_____

Name of Insured Contractor and address with zip code.

_____

Area Code and Phone Number

Insurance requirements - The Contractor shall purchase and maintain insurance that will protect him from claims that may arise out of or result from his activities under this Contract, whether those activities are performed by himself or by any Subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable.

The Contractor shall not commence work until he has obtained the minimum Insurance required below and such Insurance has been approved by the contractor. This approval shall not relieve or decrease the Contractor's liability. The Insurance shall be kept in force until the work is completed and accepted by the Owner. Changes in the Insurance policies shall not be made until Thirty (30) DAYS AFTER written notices have been delivered to the contractor and the Owner.

Liability Insurance shall include all major divisions of coverage and be on a comprehensive basis.

1. Premises Operations
2. Independent Contractor's Protective
3. Products and Completed Operations
4. Personal Injury Liability with Employment Exclusion deleted.
5. Contractual - Including specified provision for Contractor's obligation under paragraph 4.18 of the General Conditions of the Contract for Construction.
6. Owned, non-owned, and hired motor vehicles.
7. Broad Form Property Damage including Completed operations
8. Umbrella Excess
9. Statutory Workman's Compensation.

The insurance required shall be written for not less than the following, or greater if required by law and the insurance company shall be authorized to do business in the State of Texas and appear on an approved list of the United States Treasury.

1. Workers' Compensation
   - (a) State — Statutory
   - (b) Applicable Federal — Statutory
   - (c) Employer's Liability — $1,000,000.00 or
     - (1) Each Accident $ 500,000.00
     - (2) Disease - Policy Limit — $ 500,000.00
     - (3) Disease - Each Employee — $ 500,000.00

   (Waive rights of subrogation against owner)

2. Comprehensive General Liability (including Broad Form Comprehensive General Liability On occurrence basis):
   - (a) General Aggregate — $2,000,000.00
     (Other than products and completed operations)
   - (b) Products's Completed Operations Aggregate — $2,000,000.00

(c) Personal Injury Limit $1,000,000.00
(1) Each Occurrence $1,000,000.00
(2) Fire Damage $ 50,000.00
(3) Medical Payments $ 5,000.00
(Waive rights of subrogation and show Owner as additional insured)

3. Comprehensive Automobile Liability:
Bodily Injury & Property Damage
$500,000.00 COMBINED SINGLE LIMIT

Coverage to include owned, hired and non-owned automobiles.

4. Excess Liability (Umbrella) each occurrence $1,000,000.00
Builder's Risk Insurance
(All Risk Form) with Owner named as additionally insured.

Completed Value (Equal at all times to insurance value of
material delivered, stored in bonded warehouses, & labor performed).

The above designated limits of coverage are minimum requirements of insurance.

PROPERTY INSURANCE
The Contractor shall purchase and maintain property insurance upon the entire Work at the site to the full insurable value thereof. Such insurance shall be in a company or companies against which the Owner has no reasonable objection. This insurance shall include the interests of the Owner, the Contractor, subcontractors, and sub--subcontractors in the Work and shall insure against the perils of fire and extended coverage and shall include "all risk" insurance for physical loss or damage including, without duplication of coverage, theft, vandalism, and malicious mischief. If not covered under all risk insurance or otherwise provided in the Contract Documents, the Contractor shall effect and maintain similar property insurance on portions of the Work stored off the site or in transit when such portions of the Work are to be included in an Application for Payment.

The form of policy for this coverage shall be completed value to be purchased and paid for by the Contractor.

If by the terms of this insurance any mandatory deductibles are required, or if the Contractor should elect to increase the mandatory deductible amounts or purchase this insurance with voluntary deductible amounts, the Contractor shall be responsible for payment of the amount of the deductible in the event of a paid claim.

The Contractor shall file two certified copies of all policies with the Owner before exposure to loss can occur. If the Owner is damaged by the failure of the Contractor to maintain such insurance and to so notify the Owner, then the Contractor shall bear all reasonable costs properly attributable thereto.

SHEET NUMBER	SHEET TITLE
AD101	DEMOLITION PLAN
A101	FLOOR PLAN
A102	REFLECTED CEILING PLAN
A201	DOOR & WINDOW SCHEDULES
A401	SECTIONS & DETAILS
A601	INTERIOR ELEVATIONS & SECTIONS
M101	FLOOR PLAN HVAC
M201	DETAILS & SCHEDULES HVAC
E101	FLOOR PLAN ELECTRICAL

END OF SECTION

1. The bid date for the project Building Construction is scheduled for **Tuesday, November 14, 2017 @ 10:00 a.m.**. Contracts are scheduled to be signed on or before **November 24, 2017**. Ten days are allowed for the successful contractor to obtain the required Performance and Payment Bonds if required with Insurance Certificates. Layout of on site General Construction will start on or before **November 27, 2017**.

2. Work under this Contract shall be completed by **February 16, 2018**.

3. A **pre-bid walk-through of the project will be held at 10:00 a.m., November 2, 2017**. Contractors shall meet in the Club House Lobby.

4. Contractor shall make all arrangements within his organization in order to complete the project in the specified time allotted as presented to the Architect, his schedule of critical materials and times for approval that must be kept. All design submittals, and shop drawings not in the Architect's possession within 30 days after contract signing will not be considered, and item causing unnecessary delay and will require the Contractor to use double shift jobsite crews to make up time, at his expense, until the project is back on schedule.

END OF SECTION

1. GENERAL

a. Work included: To provide adequate budget and bonding to cover items not precisely determined by the Owner prior to bidding, allow within the proposed Contract Sum the amounts described below.

b. Related Work:

1. Documents affecting work of this Section included, but are not necessarily limited to , General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Other provisions concerning Cash Allowances are stated in Paragraph 4.8 of the General Conditions.
3. Other provisions concerning Cash Allowances also may be stated in other Sections of these Specifications.

2. SPECIFIC CASH ALLOWANCES

a. Contingency: Provide $ 10,000.00 in the contract for items to be considered during construction.

END OF SECTION

GENERAL

1.01 REQUIREMENTS INCLUDED

Contractor shall be responsible for all cutting, fitting and patching; including attendant excavation and backfill required to complete the Work or to:

1. Make its several parts fit together properly.
2. Uncover portions of the Work to provide for installation of ill-time work.
3. Remove and replace defective work.
4. Remove and replace work not conforming to requirements of Contract Documents.
5. Remove samples of installed work as specified for testing.
6. Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit as required by Sub-Contractor. Sub-Contractor to include cost to his bid.

1.02 SUBMITTALS

A. Submit a written request to Owner well in advance of executing any cutting or alteration which affects:
   1. Work of the Owner or any separate contractor.
   2. Structural value or integrity of any element of the Project.
   3. Integrity or effectiveness of weather-exposed or moisture-resistant elements or systems.
   4. Efficiency, operational life, maintenance or safety of operational elements.
   5. Visual qualities of sight-exposed elements.

B. Request shall include:
   1. Identification of the project.
   2. Description of affected work.
   3. The necessity for cutting, alteration or excavation.
   4. Effect on work of Owner or any separate contractor, or on structural or weatherproof integrity of Project.
   5. Description of proposed work:
      a. Scope of cutting, patching, alteration, or excavation.
      b. Trades who will execute the work.
      c. Products proposed to be used.
      d. Extent of refinishing to be done.
   6. Alternatives to cutting and patching.
   7. Cost proposal, when applicable
   8. Written permission of any separate contractor whose work will be affected.

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C. Should conditions of Work or the schedule indicate a change of products from original installation.
   Contractor shall submit request for substitution as specified in Section 01630 - Substitutions and Product Options.

D. Submit written notice to Owner designating the date and the time the work will be uncovered.

2. PRODUCTS

2.01 MATERIALS

Comply with specifications and standards for each specific product involved.

3. EXECUTION

3.01 INSPECTION

A. Inspect existing conditions of Project, including elements subject to damage or to movement during cutting and patching.

B. After uncovering work, inspect conditions affecting installation of products or performance of work.

C. Report unsatisfactory or questionable conditions to Owner in writing; do not proceed with work until Owner has provided further instructions.

3.02 PREPARATION

A. Provide adequate temporary support as necessary to assure structural value or integrity of affected portion of work.

B. Provide devices and methods to protect other portions of Project from damage.

C. Provide protection from elements for that portion of the Project which may be exposed by cutting and patching work, and maintain excavations free from water.

3.03 PERFORMANCE

A. Execute cutting by methods which will prevent damage to other work and will provide proper surfaces to receive installation of repairs.

B. Execute excavating and backfilling by methods which will prevent settlement or damage to other work.

C. Employ original installer or fabricator to perform cutting and patching for:

1. Weather-exposed or moisture-resistant elements.
2. Sight-exposed finished surfaces.

D. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.

E. Restore work which has been cut or removed. Install new products to provide completed work in accord with requirements of Contract Documents.

F. Fit work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.

G. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes.

1. For continuous surfaces, refinish to nearest intersection.
2. For an assembly, refinish entire unit.

END OF SECTION

1. GENERAL

1.01 REQUIREMENTS INCLUDED

A. Provide and pay for field engineering services required for Project.
   1. Civil, structural, or other professional engineering services specified or required to execute Contractor's construction methods.

B. Owner's Representative will identify existing control points and property line corner stakes if required.

1.02 QUALIFICATIONS OF SURVEYOR OR ENGINEER

Registered professional engineer of the discipline required for the specific service on the Project, licensed in the state in which the Project is located.

1.03 SURVEY REFERENCE POINTS

A. Existing basic horizontal and vertical control points for the Project are those designated on drawings.

B. Locate and protect control points prior to stating site work and preserve all permanent reference points during construction.
   1. Make no changes or relocations without prior written notice to Architect.
   2. Report to Architect when any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations.
   3. Require surveyor to replace Project control points which may be lost or destroyed. Establish replacements based on original survey control.

1.04 PROJECT SURVEY REQUIREMENTS

A. Establish lines and levels, locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements.
      a. Stakes for grading, fill, and topsoil placement.
      b. Utility slopes and invert elevations.
   2. Batter boards for structures.
   3. Building foundation, column locations, and floor levels.
   4. Controlling lines and levels required for mechanical and electrical trades.

B. From time to time, verify layouts by same methods.

1.05 RECORDS

Maintain a complete, accurate log of all control and survey work as it progresses.

1.06 SUBMITTALS

A. Submit name and address of Surveyor and Professional Engineer to Owner.

B. On request of Owner, submit documentation to verify accuracy of field engineering work.

C. Submit certificate signed by registered engineer or surveyor certifying that elevations and locations of improvements are in conformance, or non-conformance, with Contract Documents.

END OF SECTION

1. GENERAL

1.01 REQUIREMENTS INCLUDED

Abbreviations and acronyms used in Contract Documents to identify reference standards.

1.02 QUALITY ASSURANCE

A. Application: When a standard is specified by reference, comply with requirements and recommendations stated in that standard, except when requirements are modified by the Contract Documents or applicable codes establish stricter standards.

B. Publication Date: The publication in effect on the date of issue of Contract Documents, except when a specific publication date is specified.

1.03 ABBREVIATIONS, NAMES AND ADDRESSES OF ORGANIZATIONS

Obtain copies of referenced standards direct from publication source when needed for proper performance of Work, or when required for submittal by Contract Documents.

END OF SECTION

1. GENERAL:

a. Contractor : state on Proposal Form amount to be deducted and/or added to Base Contract Price, unless noted otherwise, for performing following Alternates to Contract, subject to following conditions:

b. Deductions/Additions : include any additive or deductive modifications of work or additional work that may be required by reason of acceptance of any alternate.

c. Owner reserves right to reject acceptance of any alternate and accept following alternate so long as there is not overlap in intent of following alternate.

d. Where entire specification sections are part of work to be bid as an Alternate, that section is noted in Table of Contents. Specification Sections in which only parts of work of that section are part of work to be bid as Alternate are not identified in Table of Contents but that fact is noted in section itself, except that no listing or other identification of work in specifications which is part of work to be bid as Alternate : in any way limit Contractor's obligation to bid and furnish credits, materials and work reasonably and generally understood to be part of work described.

END OF SECTION

1. REQUIREMENTS INCLUDED:

Submit Applications for Payment to Owner in accord with the schedule established by Conditions of the Contract and Agreement Between Owner and Contractor.

2. RELATED REQUIREMENTS:

a. Agreement Between Owner and Contractor

b. Conditions of the Contract: Progress Payments, Retainages, and Final Payment.

3. FORMAT AND DATA REQUIRED:

Submit itemized applications typed on AIA Document G702, Application and Certificate for Payment, and continuation sheets G702A.

4. PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT:

a. Application Form:
   (1) Fill in required information, including that for Change Orders executed prior to date of submittal of application.
   (2) Fill in summary of dollar values to agree with respective totals indicated on continuation sheets.
   (3) Execute certification with signature of a responsible officer of Contract firm, properly notarized.

b. Continuation Sheets:
   (1) Fill in total list of all scheduled component items of work with item number and scheduled dollar value for each item.
   (2) Fill in dollar value in each column for each scheduled line item when work had been performed or products stored. Round off values to nearest dollar.
   (3) List each Change Order executed prior to date of submission, at the end of the continuation sheets. List by Change Order Number and description, as for an original component item of work.

5. SUBSTANTIATING DATA FOR PROGRESS PAYMENTS:

a. When the Owner requires substantiating data, Contractor shall submit suitable information with a cover letter identifying:
   (1) Project.
   (2) Application number and date.
   (3) Detailed list of enclosures.
   (4) For stored products:
      a. Item number and identification as shown on application.
      b. Description of specific material.

b. Submit one copy of data and cover letter for each copy of application.

6. PREPARATION OF APPLICATION FOR FINAL PAYMENT:

a. Fill in Application form as specified for progress payments.

b. Us e continuation sheet for presenting the final statement of accounting as specified in Section 01700 - Contract Closeout.

7. SUBMITTAL PROCEDURE:

a. Submit Applications for Payment monthly to Owner based on 90% (ninety percent) of the value of material delivered and 90% (ninety percent) of the value of completed work. Time of payment will be determined in the Agreement between Owner and Contractor.

b. Materials must be delivered 15 days prior to date of billing.

END OF SECTION

1. GENERAL

1.01 REQUIREMENTS INCLUDED

A. Promptly after award of the Contract, prepare and submit to Construction Manager at Risk estimated construction progress schedules for the Work with sub-schedules of related activities which are essential to its progress.
B. Submit revised progress schedules periodically.

1.02 FORM OF SCHEDULES

A. Prepare schedules in the form of a horizontal bar chart.
   1. Provide separate horizontal bar for each trade or operation.
   2. Horizontal time scale: Identify the first work day of each week.
   3. Scale and spacing: To allow space for notations and future revisions.
B. Format of listings: The chronological order of the start of each item of work.
C. Identification of listings: By major work activities.

1.03 CONTENT OF SCHEDULES

A. Construction Progress Schedule:
   1. Show the complete sequence of construction by activity.
   2. Show the dates for the beginning and completion of each major element of construction.
   3. Show projected percentage of completion for each item as of the first day of each month.
B. Submittals Schedule for Shop Drawings, Product Data and Samples.
   Show: The dates for Contractor's submittals.

1.04 PROGRESS REVISIONS

A. Indicate progress of each activity to date of submission.
B. Show changes occurring since previous submission of schedule:
   1. Major changes in scope.
   2. Activities modified since previous submission.
   3. Revised projections of progress and completion.
   4. Other identifiable changes.
C. Provide a narrative report as needed to define:
   1. Problem areas, anticipated delays and the impact on the schedule.
   2. Corrective action recommended, and its effect.
   3. The effect of changes on schedules of other prime contractors.

1.05 SUBMISSIONS

A. Submit initial schedules within 15 days after award of Contract.
   1. Owner will review schedules and return review copy within 10 days after receipt.
   2. If required, resubmit within 7 days after return of review copy.
B. Submit revised progress schedules with each application for payment.

C. Submit the number of opaque reproductions which the Contractor requires, plus two copies which will be retained by the Owner.

1.06 DISTRIBUTION

A. Distribute copies of the reviewed schedules to:
   1. Job site file.
   2. Subcontractors
   3. Owner

B. Instruct recipients to report promptly to the Contractor in writing, any problems anticipated by the projections shown in the schedules.

END OF SECTION

1. GENERAL:

   a. Submit to the Architect Shop Drawings, Product Data and Samples required by Specification sections.

   b. Prepare and submit a list of required submittals of Shop Drawings, Product Data and Samples. Include dates for submission and need dates for each item. Attached list is to be used as guide and is not to be considered as complete.

2. RELATED REQUIREMENTS SPECIFIED ELSEWHERE:
   a. General Conditions - Paragraph 4.12 and Supplementary Conditions 00210.
   b. Project Record Documents - Section 00220, paragraph 8.
   c. Substitutions and Product Options - Section 01630.

3. SHOP DRAWINGS:

   a. Original Drawings, prepared by Contractor, subcontractor, supplier or distributor, which illustrate some portion of the work, showing fabrication, layout, setting or erection details, prepared by a qualified detailer.
   b. Reproduction for submittals: Blue line prints.
   c. See SECTION 00220, for numbers required.

4. PRODUCT DATA:
   a. Manufacturer's standard schematic drawings:
      (1) Modify drawings to delete information which is not applicable to the project.
      (2) Supplement standard information to provide additional information applicable to project.
   b. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data:
      (1) Clearly mark each copy to identify pertinent materials, products or models.
      (2) Show dimensions and clearances required.
      (3) Show performance characteristics and capacities.
      (4) Show wiring diagrams and controls.
      (5) See Divisions 15000 and 16000 for additional requirements.

5. SAMPLES:
   Physical examples to illustrate materials, equipment and workmanship, and to establish standards by which completed work is judged.

6. CONTRACTOR RESPONSIBILITIES:

   a. Review Shop Drawings, Product Data and Samples prior to submission. Initial, sign or stamp, certifying to review of submittal.
   b. Verify:
      (1) Field measurements.
      (2) Field construction criteria.
      (3) Catalog numbers and similar data.
   c. Coordinate each submittal with requirements of work and of Contract Documents.

d. Contractor's responsibility for errors and omissions in submittals is not relieved by Architect's review of submittals.
e. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Architect's review of submittals, unless Architect/Engineer gives written acceptance of specific deviations.
f. Notify Architect, in writing at time of submission, of deviations in submittals from requirements of Contract Documents.
g. Begin no work which describes submittals until return of submittals with Architect's stamp and initials or signature indicating review.
h. After Architect's and Owner's review, distribute copies.

7. SUBMISSION REQUIREMENTS:
   a. Schedule submissions to Architectat least 30 days before date reviewed submittals will be needed, in accordance with approved submittal schedule.
   b. Submit 6 Blueline prints of Shop Drawings.
   c. Submit 8 copies of Product Datum.
   d. Submit number of Sam ples specified in each of specification sections.
   e. Accompany submittals with transmittal letter, containing:
      (1) Date
      (2) Project title and number
      (3) Contractor's name and address
      (4) The number of each Shop Drawing, Product Datum and Sample submitted.
      (5) Notification of deviations from Contract Documents.

8. RE-SUBMISSION REQUIREMENTS:
   a. Shop Drawings:
      (1) Revise initial drawings as required and re-submit as specified for initial submittal.
      (2) Indicate on drawings any changes which have been made, other than those requested by Architect.
   b. Product Data and Samples: Submit new datum and samples as required for initial submittal.

9. DISTRIBUTION OF SUBMITTALS AFTER REVIEW:
   a. Architect will retain two copies of approved or corrected Shop Drawings and Product Datum. On mechanical and electrical submittals the consulting engineer will retain one additional copy of related data.
   b. Architect will forward 1 copy of approved or corrected Shop Drawings and Product Datum to Owner.
   c. Architect will return remaining copies to Contractor for Distribution.
   d. Contractor : distribute remaining copies of Shop Drawings and Product Datum which carry Architect's stamp, as required for construction, including Contractor's file, job site file, subcontractors, suppliers and fabricators.

END OF SECTION

1. TEMPORARY HEAT:
   Provided by Owner.

2. TEMPORARY LIGHT, POWER:
   Provided by Owner.

3. TEMPORARY HOISTS:
   a. Do not construct hoists at such locations as will interfere with or affect work of other contractors; locate them a sufficient distance from exterior walls; provide protection to prevent damage, staining, marring of permanent work.

4. TEMPORARY OFFICES:
   Contractor to Provide and maintain a jobsite office in the existing building for use of Architect, Owner, Sub-contractors. Maintain office; heat during cold weather and cool during hot weather; maintain doors, locks on doors, tables, benches, drawing racks. Keep complete set of construction documents up-to-date with addenda, change orders, etc., for use of Architect on jobsite. Separate rack from Contractor's work desk required f or use of storage of shop drawings and separate contract documents.

5. TEMPORARY TELEPHONE:
   Not applicable.

6. SANITARY FACILITIES FOR WORKMEN:
   a. Contractor : provide and maintain suitable, weather-tight, painted, sanitary toilet facilities for workmen for entire construction period. Comply with requirements of applicable health authorities and Department of Labor Occupational Safety and Health Standards. W hen toilet facilities are no longer required, promptly remove from site, disinfect and clean or treat area as required. Existing sewer line may be tapped outside of existing slab area.

   b. Contractor : keep toilet facility swept clean and supplied with toilet tissue at all times.

   c. Owner's facilities within near completed structure : not be used at any time without his written permission.

   d. If any new construction surfaces in project other than toilet facilities provided for herein, are soiled at anytime, entire area so soiled : completely removed from project and rebuilt.

7. TEMPORARY WATER SERVICE:
   Provided by Owner.

8. TEMPORARY STAIRS, LADDERS, RAMPS, RUNWAYS AND ENCLOSURES:
   Furnish, maintain, equipment such as temporary stairs, ladders, ramps, scaffolds, runways, derricks, chutes, and like, as required for proper execution of work by trades. Such apparatus equipment, construction : as per labor laws, other state and local laws applicable thereto.

9. REMOVAL OF TEMPORARY WORK:
   Remove temporary work from premises, on or before completion of work.

10. TEMPORARY OR TRIAL USAGE:

a. Temporary or trial usage by Owner or any mechanical device, machinery, apparatus, equipment, or any work or materials supplied under contract before final completion and written acceptance of same by Architect : not be construed as evidence of Architect's acceptance of same.

b. If Contractor so elects, he may, without extra cost to Owner, place approved persons to make trial usage. Make such trial under Architect's supervision.

11. PERMANENT UTILITY CONNECTIONS AND SERVICE:
Not applicable.

12. PROTECTION OF THE WORK:
a. Contractor,: at all times, provide protection against weather, so as to maintain work, materials, apparatus, and fixtures free from injury or damages. At end of day's work, new work likely to be damaged: covered or otherwise protected as required.

b. Wet work : not be performed when temperature is below 40 F. or is likely to go below 40 F., within ensuing 48 hours, except when sufficient protective heat is provided and Architect's approval in writing is obtained.

c. Construct and maintain necessary temporary drainage and do pumping necessary to keep excavations and floors, pits, and trenches free of water from whatever source.

d. If low temperatures make it impossible to continue operations safely in spite of cold weather precautions, contractor : cease work and : so notify Architect. Open fires are not permitted within the building enclosure.

e. Climatic Conditions: When so ordered by Architect, Contractor : suspend any work that may be subject to damage by climatic conditions.

f. Snow, ice: Remove snow, ice as necessary for safe and proper execution of work.

13. TEMPORARY JOB-SITE PROTECTION:
Not applicable.

14. MISCELLANEOUS SAFETY REQUIREMENTS:
a. Comply with applicable laws and regulations concerning safety requirements.

b. Guard Lights. Provide, maintain guard lights at barricades, obstructions in streets, roads or sidewalks, at trenches or pits adjacent to public or roads.

c. Fire. Obtain inspection of premises by local protection authority. Provide and maintain equipment, signs; enforce regulations recommended and/or required by regulating authority.

END OF SECTION

1. GENERAL:

   See referenced note in SECTION: SPECIAL CONDITIONS, paragraph 1.

2. SCOPE:

   a. This section covers project sign completely.

   b. Immediately upon beginning of work under this contract, Contractor : accomplish work covered under this section of specifications. Locations of project sign,: as determined by Architect.

3. PROJECT SIGN:

   a. Job sign not required.

   b. Bulletin Board for required government notices : attached to side of office and glass covered as required.

END OF SECTION

1. GENERAL

1.01 REQUIREMENTS INCLUDED

Provide secure storage and protection for products to be incorporated into the work and maintenance and protection for products after installation and until completion of the Work.

1.02 STORAGE

A. Store Products immediately on delivery and protect until installed in the Work. Store in accord with manufacturer's instructions with seals and labels intact and legible.

B. Store products subject to damage by elements in substantial weathertight enclosures.
   1. Maintain temperatures within ranges required by manufacturer's instructions.
   2. Provide humidity control for sensitive products as required by manufacturer's instructions.
   3. Store unpacked products on shelves, in bins, or in neat piles accessible for inspection.

C. Exterior Storage:
   1. Provide substantial platforms, blocking, or skids to support fabricated products above ground; prevent soiling or staining. Cover products subject to discoloration or deterioration from exposure to the elements with impervious sheet coverings. Provide adequate ventilation to avoid condensation.

   2. Store loose granular materials on solid surfaces such as paved areas, or provide plywood or sheet materials to prevent mixing with foreign matter.
      a. Provide surface drainage to prevent flow or ponding of rainwater.
      b. Prevent mixing of refuse or chemically injurious materials or liquids.

D. Arrange storage in a manner to provide easy access for inspection.

1.03 MAINTENANCE OF STORAGE

A. Maintain periodic system of inspection of stored products on scheduled basis to assure that:
   1. State of storage facilities is adequate to provide required conditions.
   2. Required environmental conditions are maintained on continuing basis.
   3. Surfaces of products exposed to elements are not adversely affected. Any weathering of products, coatings, and finishes is acceptable under requirements of Contract Documents.

B. Mechanical and electrical equipment, which requires servicing during long term storage shall have complete manufacturer's instructions for servicing accompanying each item with notice of enclosed instructions shown on exterior of package.
   1. Comply with manufacturer's instructions on scheduled basis.
   2. Space heaters, which are part of electrical equipment, shall be connected and operated continuously until equipment is placed in service.

1.04 PROTECTION AFTER INSTALLATION

A. Provide protection of installed products to prevent damage from subsequent operations. Remove when no longer needed prior to completion of Work.

B. Control traffic to prevent damage to equipment and surfaces.

C. Provide coverings to protect finished surfaces from damage.
   1. Cover projections, wall corners, and jambs, sills, and soffits of openings in areas used for traffic and for passage of products in subsequent work.
   2. Protect finished floors and stairs from dirt and damage:
      a. In areas subject to foot traffic, secure heavy paper, sheet goods, or other materials in place.
      b. For movement of heavy products, lay planking or similar materials in place.
      c. For storage of products, lay tight wood sheathing in place.
      d. Cover walls and floor of elevator doors, used by construction personnel.

D. Waterproofed and roofing surfaces.
   1. Prohibit use of surfaces for traffic of any kind and for storage of any products.
   2. When some activity must take place in order to carry out the Contract, obtain recommendations of installer for protection of surface.
      a. Install recommended protection, remove on completion of that activity.
      b. Restrict use of adjacent unprotected areas.

1.05 OFF-SITE STORAGE

Any off-site storage by the Contractor of material for which payment is requested shall be as follows:
1. Located in a bonded warehouse.
2. Be insured for the full value of the material.
3. Have a listing of inventory, itemized and listing all quantities and descriptions, checked and certified by the Contractor requesting the payment.
4. No payment for off-site storage will be allowed unless the above is complied with.

1.06 CONTRACTOR RESPONSIBILITY

Each Contractor shall be held responsible (even after payment has been made by the Owner to the Contractor) for all materials stored on the site or incorporated in the structure against theft, acts of vandalism, or any other act that is not protected or covered by any insurance that is in force. It shall be the responsibility of the Contractor to deliver to the Owner a completely new and finished piece of construction work upon final payment.

The Owner assumes no responsibility for stored material.

END OF SECTION

1. GENERAL:
   See referenced note in SECTION: SPECIAL CONDITIONS, paragraph 1.

2. RELATED REQUIREMENTS SPECIFIED ELSEWHERE:
   General Conditions.

3. PRODUCT LIST:
   a. Within 30 days after date of each subcontract, submit to Architect 5 copies of complete list of products and materials which are proposed for installation.
   b. Prepare list on basis of each specification section.
   c. For products specified under reference standards, include with listing of each product:
      (1) Name and address of manufacturer.
      (2) Trade name.
      (3) Model or catalog designation.
      (4) Manufacturer's data, including performance and test data, reference standards.

4. CONTRACTOR'S OPTIONS:
   a. For products specified only by reference standards, select any product meeting standards, by any manufacturer.
   b. For products specified by naming several products or manufacturers, Architect may select any product and manufacturer named.
   c. For substitution of products specified by naming only one product and manufacturer or to establish a quality standard, the Contractor : submit request for substitution as specified be low.

5. STANDARDS FOR SUBSTITUTIONS:
   a. During Bidding, Architect will consider written requests from Bidders and manufacturers for substitutions. Such requests must be received at least 7 days prior to Bid Date. Requests received after that time will not be considered. Approval of proposed substitutions will be set forth in an Addendum or letter of approval. Requests for substitutions : include data listed below.
   b. Within 30 days after date of Contract, Architect will consider formal requests from Contractor for substitutions of products in place of those specified.
   c. Submit 2 copies of request for substitution. Include in substitution:
      (1) Complete data substantiating compliance of proposed substitution with Contract Documents.
      (2) For products:
         a. Product identification, including manufacturer's name and address.
         b. Manufacturer's literature, including product description, performance and test data and reference standards.
         c. Samples, if applicable.
         d. Name and address of similar projects on which product was used and date of installation.
      (3) For construction methods:
         a. Detailed written descriptions of proposed method.
         b. Complete drawings illustrating methods or revisions.
      (4) Itemized comparison of proposed substitution with product or method specified.
      (5) Data relating to changes in construction schedule.

d. In making request for substitution, Bidder/Contractor represents:

(1) He has personally investigated proposed product or method and determined that it is equal or superior in all respects to that specified.

(2) He will provide same guarantee for substitution as for product or method specified.

(3) He will coordinate installation of accepted substitution into work making such changes as may be required for work to be complete in all respects.

(4) He waives all claims for additional costs related to substitution which subsequently become apparent.

e. Substitutions will not be considered if:

(1) They are indicated or implied on Shop Drawings or Product Data submittals without formal request submitted in accordance with Article 5 of this Section.

(2) Acceptance will require substantial revision of Contract Documents.

f. If substitution is not approved or accepted, Contractor : furnish specified product.

END OF SECTION

1. GENERAL:

See referenced note in SECTION "SPECIAL CONDITIONS", paragraph 1.

2. RELATED ITEMS:

a. Termination by Contractor is described in Article 14 of AIA GENERAL CONDITIONS.
b. Also see amendments to GENERAL CONDITIONS.

3. FINAL ACCEPTANCE OF THE WORK:

a. "With application for final payment, Contractor : deliver to Owner affidavit (on form satisfactory to Owner) that bills, for materials and labor, chargeable against Contract are paid, and guarantees or bonds as required on specific branches of Work. In order not to delay y final payment, Contractor should have necessary bonds, guarantees, receipts, affidavits, etc., prepared and signed in advance with letter of transmittal listing each paper. He should hand same to Owner at time of final inspection."

b. When Work is completed, Contractor : notify Architect/Engineer in writing that Work will be ready for final inspection on definite date. Upon verification by Architect/Engineer that Work is ready for final inspection and, when Work is found acceptable under Contract Documents and Contract is fully performed, make final payment to Contractor.

4. SUBSTANTIAL COMPLETION, OWNER'S OCCUPANCY, AND FINAL PAYMENT:

a. When Contractor determines that Work or designated portion thereof acceptable to Owner is substantially complete, Contractor : prepare for submission to Architect/Engineer list of items to be completed or corrected. Failure to include any items on such list does not alter responsibility of Contractor to complete Work. When work i s substantially complete, he will then prepare Certificate of Substantial Completion which : establish Date of Substantial Completion; : state responsibilities of Owner and Contractor for maintenance, heat, utilities, operation of permanent equipment, and insurance; and : fix time within which Contractor : complete items listed therein, said time to be within Contract time. Certificate of Substantial Completion : submitted to Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate.

b. Occupancy of building or any part thereof may be made after above paragraph has been complied with.

5. WARRANTY AND GUARANTEE:

a. Except as otherwise specified, Contractor warrants and guarantees Work against defect in materials, equipment, or workmanship for one year from date of final acceptance or beneficial occupancy of facility by Owner, whichever is earlier. Upon receipt of written notice from Owner of discovery of any defects, Contractor : remedy defects and replace any property damaged therefrom occurring within warranty and guarantee period. In case of Work performed by Subcontractors and where guarantees are required, Contractor : secure warranties from said

Subcontractors addressed to and in favor of Owner; deliver copies of same to Architect/Engineer upon completion of Work, guarantee and assume full responsibility for full period of said warranties, and delivery of said guarantees : not relieve Contractor from any obligation assumed under any other provision of Contract.

b. Neither final payment nor any provision of Contract Documents : relieve Contractor of responsibility for faulty materials or workmanship.

c. If Contractor after notice fails to proceed promptly to comply with terms of warranty and guarantee, Owner may have defects corrected and Contractor and his surety : liable for expense incurred.

END OF SECTION

1. GENERAL:
   See referenced note in SECTION: SPECIAL CONDITIONS, paragraph 1.

2. DESCRIPTION OF WORK:
   Provide labor and materials to complete miscellaneous metals as indicated and specified.

3. RELATED WORK SPECIFIED ELSEWHERE:
   a. Masonry Accessories: SECTION: MASONRY ACCESSORIES.
   b. Painting: SECTION: PAINTING AND FINISHING.

4. QUALITY ASSURANCE:
   a. Requirements of Regulatory Agencies and Reference Standards:
      (1) Conform to: Standard Specifications for Design, Fabrication and Erection of Structural Steel for Buildings. A.I.S.C. and "Code for Welding in Building Construction," American Welding Society, Inc. , latest edition, where not sight exposed.
      (2) Conform to "Specification for Architecturally Exposed Structural Steel, A.I.S.C. where sight exposed.
   b. Fabrication:
      (1) Qualifications: Work: executed in shop whose products are limited to highest quality work.
      (2) Welding as required:
         (a) Welding: in accordance with American Welding Society Publications D 1.0-63, "Welding in Building Construction"; and D2.0-63, "Welding Highway and Railway Bridges", latest edition.
         (b) Cleaning of Welds: Welding slag, weld spatter, rust and burnt paint: removed with slag hammer and metal scraper and then wire brushed until completely cleaned. Temporary erection bracing, clips, etc.,: removed and any burrs left after their removal: ground flush with parent metal on structural members. Undercuts and pulled places in parent metal on exposed members made during erection: filled by welding and ground flush. One coat of primer paint (or "Galv-Weld" for galvanized items) : applied immediately after cleaning.
         (c) Removal or unsatisfactory welding: by chipping or arc-air method.
         (d) Weld lengths and sizes: as indicated.

   c. Workmanship:
      (1) Connections:
         (a) Connections not otherwise detailed: support full load capacity of members joined.
         (b) Connections not otherwise detailed : selected to support one half of total uniform load capacity of member as tabulated by A.I.S.C. Code for given shape, span, and steel specification of member.
         (c) Design of members and connections for any portion of structure not indicated on contract drawings : completed by fabricator and indicated on shop drawings. Connections not indicated : made to conform to AISC Specifications for Design, Fabrication and Erection of Structural Steel for Buildings or in case of connections using high strength bolts, specifications for structural joints using ASTM A-325 bolts.
         (d) Items detailed on plans to be anchored with screws or bolts, or to receive blocking or other bolted items : provided with holes at spacing indicated.

(2) Intermittent and continuous welding, and straightening of built-up sections : done in manner to minimize internal stresses.
(3) Where exposed welding is required, welds : executed neatly and ground smooth without pits or blemishes.
(4) Exposed items : cleaned of weld spatter and slag prior to painting.
(5) Modification of details of fabrication for economy or feasibility : made only on written approval of Architect. Exposed members: selected, and : free from bend, warp, or other defects, conform to AISC "Specification for Exposed Structural Steel".
(6) Work : fitted together at shop as far as possible, and delivered complete and ready for erection. Use of gas cutting torch in field for correcting fabricating errors will be permitted only after approval of Architect.
(7) Remove and grind smooth markings (heat numbers manufacturer's name, etc.) from sight expos ed steel, except in storage and mechanical room areas. Pits, gouges, and imperfections of any nature will not be permitted on sight exposed steel.

5. MATERIALS:
a. Steel : conform to requirements of ASTM A36. Steel : clean and free from mill scale, rust, pitting and warps.
(1) Mill test showing heat number of structural steel : furnished to Architect prior to delivery of steel to job site.
(2) Steel of domestic manufacturer only will be accepted.

b. Galvanizing:
(1) Items indicated to be galvanized : hot dip galvanized after fabrication in accordance with ASTM A123, A385, or A386, as applicable.
(2) Field welds on galvanized items : touched-up as approved using "Galv-Weld" as manufactured by Galv-Weld Products Co., P.O. Box 1303, Bradenton, Fla.
c. Anchors and Fasteners:
(1) Required for items included under this section of specifications.
(2) Structural Connections:
(a) Steel to concrete and masonry: Molly Parabolt Concrete Anchors or equal unless otherwise detailed. Minimum 3/8" diameter bolts where not otherwise indicated. Installed in approved epoxy grout only at top of horizonal surface. Set in concrete when poured, masonry laid, minimum 6" imbedment for 1/2" bolts.
(b) Contractor : furnish and install Molly Para bolt Concrete Anchors or equal : made of high tensile and shear strength steel with a minimum of two i dependent-acting spring expander segments and double plating (zinc plating FS QQZ-325b plus chromate coating). Pullout values to equal or exceed those shown for this anchor under Federal GSA Spec. FF-S325, Interim Amendment No.3.
(c) Provide necessary holes of proper size and spacing to receive screws and bolts.
(3) Toggle bolts-two wing spring type. Size indicated or of proportionate strength for members secured. Length as required
(4) Molly screw anchors, Molly Corp. or equal.
(a) In walls, 1/16" to 5/8" thick, use "S" length.
(b) In walls, 5/8" to 1-1/2" thick, use "S" length.
(c) In walls, 1-1/2 to 1-3/4" thick, use "XL" length.
(d) If wall material has tendency to crumble, use Molly safety wrench or equal.
(5) Paint for shop coat and field touch-up TNEMEC Corp. Co. 99D (dark red) Metal primer, or approved equal.

d. Aluminum, extrusions for architectural and special shapes : extruded in alloy 6063-T5. Alloy 6061-T6 : used to impart high strength characteristics to structural shapes. See "Aluminum Construction Manual", published by the Aluminum Association, 420 Lexington Avenue, New York, N.Y. Use Brushed Anodized finish on aluminum.

e. Pipe : conform to requirements of ASTM A53, Grade "B", with not more than .05 PCT. sulfur content; use at pipe handrails only.

f. Miscellaneous items specified by manufacturer at end of section.

g. Shop Painting:
   (1) Provide steel not galvanized or not encased in concrete with one shop coat of specified paint. Completely cover surfaces.
   (2) Steel : thoroughly cleaned prior to application of shop coat.
   (3) Mix and apply paint in strict conformance with paint manufacturer's instructions.
   (4) Shop coat : have dry film thickness of not less than 3 mils.
   (5) Fabricator : certify on shop drawings to effect than shop coat of paint used is as specified.
   (6) Shop coat of paint will be checked and tested by Architect prior to steel erection.
   (7) Immediately after erection, touch up scratches, welds, and other paint blemishes with same type paint used for shop coat. Provide sufficient quantity of paint specified above for touch-up required at project site.

6. DELIVERY AND STORAGE:
Handling and storage of steel : with care to avoid bending, twisting, or other damage. Unloading : under supervision of General Contractor. Steel : stored to allow drainage of water from parts. Blocking : placed to keep steel off ground.

7. INSTALLATION:
   a. Use experienced personnel and prop er equipment.
   b. Set steel accurately to line and level.
   c. Field connections not sight exposed may be bolted or welded at contractor's option, exceptions as noted.
   d. Steel items that are to be in contact with aluminum, concrete, masonry, or mortar : given heavy coat of Pratt and Lambert asphaltic varnish or equal on contact surfaces. Do not coat sight exposed surfaces or surfaces to receive caulking.

8. SHOP DRAWINGS:
   a. Required for items.
   b. Show size and length of members, welds, details of connections, locations of bolt holes for blocking and erections, and necessary details and information.
   c. Indicate name of mill from which steel or aluminum : supplied.
   d. Begin fabrication only after receiving approved shop drawings.

9. MISCELLANEOUS METAL ITEMS:
Items : include but not necessarily be limited to following lists which are guide to type of work which : provided by this section.

   a. Galvanized Steel Items: Hot-dip galvanized fabrication : miscellaneous clip angles at exterior

locations at roof.

b. Shop Coated Steel Items:
   (1) Angles and plates for lintels and miscellaneous framing and bracing.
   (2) Miscellaneous clip angles not otherwise noted.
   (3) Angles and clip angles for partition bracing.

c. Toilet partition anchors as required to rigidly attach partitions.

d. Miscellaneous channels, angles, plates and shapes as indicated and required for installation of Owner furnished equipment where not furnished by equipment manufacturer.

e. Installation of manufacturer furnished anchorage items.

f. Back-up plates, angles, bolts and other reinforcement and fasteners for wall or ceiling mounted items not otherwise indicated or specified

g. Stair nosings at exterior steps : 3" wide, Type T-305, single component abrasive of epoxy and grit, color to C10, black with standard Type 1 Anchor as manufactured by Balco Safety Tread of Wichita, Kansas.

h. Steel Pipe Handrails:
   (1) Handrails at exterior (**to meet ADA Guidelines**) : 1-1/2" outside diameter steel pipe as specified in 5. e. above. All joints : welded and ground smooth.
   (2) Number of horizontal and vertical rails as indicated on drawings: If not indicated: Verticals shall be 1/2" x 1/2" bar @ 4" o.c. with vertical pipe @ 4'- 0" o.c.

i. Renovation Projects w/Additions:
   (1) Quality Standard: This portion of the specifications are based on products of BALCO INC. for expansion joint covers. Products of other acceptable manufacturers : meet or exceed product and performance standards of BALCO INC. for expansion joint covers. This portion of the specifications, whichever is more stringent.
   (2) Materials:
      (a) Extruded aluminum 6063-T5
      (b) Extruded filler strips of flexible PVC.
   (3) Finishes:
      (a) Floor : Mill Finish
      (b) Wall Ceiling : 204R-1 clear anodized finish.
   (4) Types:
      (a) Floor to Floor (NEW) : 6FTP-1.
      (b) Floor to Floor (NEW to EXISTING) : 6FVTP-1E
      (c) Floor to Walls : 6FVTP-1
      (d) Wall to Wall : (PARALLEL) : 6TW-1
      (e) Wall to Wall : (PERPENDICULAR) : 6TWC-1
      (f) Suspended Ceiling to wall: CICI-1 3/4
      (g) Suspended Ceiling to suspended ceiling: Type CIWI-2 1/2".

END OF SECTION

1. GENERAL:
   See referenced note in SECTION: SPECIAL CONDITIONS, paragraph 1.

2. DESCRIPTION OF WORK:
   a. Furnish labor and materials to complete rough carpentry work not specified as part of other sections, and which is generally not exposed, except as otherwise indicated herein.

   b. Categories of rough carpentry generally include, but are not limited to wood framing, wood grounds, nailers, blocking, sleepers, shims, spacers, curbs, wood furring, sheathing, underlayment, plywood backing.

3. RELATED WORK SPECIFIED ELSEWHERE:
   a. Finished wood casework, plastic laminate covered counter tops: SECTION: ARCHITECTURAL WOODWORK.

   b. Finished wood trim: SECTION: FINISH CARPENTRY.

4. SUBMITTALS:
   a. WOOD TREATMENT DATA: Submit treatment manufacturer's instructions for proper use of each type of treated material.

   b. If products other than that specified are submitted for approval, product data must accompany submitted items. If drawings are required to explain submittal approval, they should display manufacturer's methods. Substitutions shall be submitted no less than 10 days prior to bid date.

5. PRODUCT HANDLING:
   Delivery and storage: Keep materials dry at all times. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and plywood, and provide air circulation within stacks.

6. JOB CONDITIONS: Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow proper attachment of other work.

7. PRODUCTS:
   a. Wood Product Quality Standards:
      (1) Lumber Standards : Comply with PS 20.
      (2) Plywood Standard : Comply with PS1.
      (3) Factory-mark each piece of lumber or bundle or bundled stock, and plywood with type, grade, mill, and grading agency, except omit marking from surfaces to be exposed with transparent finish or without finish.
      (4) Use only the recognized official marks of the association under whose rules it is graded.
      (5) Grade and trade marks : not be required if each shipment is accompanied by certificate of inspection issued by grading association.

   b. Lumber:
      (1) Provide best quality of its respective grades, and kinds.
      (2) Grades specified : conform to the latest grading rules of the Southern Pine Association, The West Coast Lumberman’s Association, American Plywood Association, or Lumber

Manufacturers Association under whose rules the lumber was produced.

(3) Maximum moisture content 19 percent.

(4) All wood blocking in any fire rated or smoke rated partitions to have Fire Retardant Treatment and comply with all governing ordinances.

c. Grades:

(1) Interior framing and blocking:
Douglas Fir number 2 medium grade, or number 2 Southern Pine.

(2) Concealed blocking for cabinets and shelving:
Douglas Fir number 2 medium grade, or number 2 Southern Pine.

(3) Wood members at roof edges and blocking:
Douglas Fir number 2 medium grade, or number 2 Southern Pine.
Lumber : preservative-treated as specified.
Treatment : applied after members are shaped.

(4) Nailers and plates in contact with any type concrete, masonry, precast conc. or plaster;
Douglas Fir number 2 medium grade, or number 2 Southern Pine.
Lumber : preservative-treated as specified.
Treatment: applied after members are shaped.

(5) Nailers and blocking : Douglas Fir number 2 medium grade, or number 2 Southern Pine.
Lumber : preservative-treated as specified.
Treatment : applied after members are shaped.

(6) Miscellaneous rough lumber not otherwise specified:
Douglas Fir number 2 medium grade, or number 2 Southern Pine.
Where noted, lumber : preservative-treated as specified.
Treatment : applied after members are shaped.

(7) Wood member supports and blocking for wall hung vanities, counters and shelves, etc., : have a minimum "Fb" of 1450 p.s.i. Also see painted exposed plywood paragraph 10c. his section.

(8) Plywood:

(a) Exposed plywood : where no finish is required, provide C-C EXT. APA, Grade stress level - S1.

(b) Concealed Plywood : where concealed by other work at roof parapets, provide, C-D plugged EXTERIOR GRADE APA Preservative treated. Thickness as indicated.

(c) Painted exposed plywood : at interior C.D. - INT.-APA GRADE STRESS LEVEL 2-3, SPECIES GROUP 3 or better.

(d) Roof decking: Wafer Board : a rigid wood panel equal to Blandex; 5/8" thick.

(1) Density : 40 lbs./cu. ft.
(2) Modules of Rupture : 2500 p.s.i.
(3) Modules of Elasticity : 450,000 p.s.i.
(4) Minimum Internal Bond : 60 p.s.i.
(5) Face Screw Holding Strength : 250 lbs.
(6) All exposed edges : treated for moisture resistance.

or Plywood :

(1) Thickness : 5/8".
(2) Grade : C-C EXT -APA.
(3) Stress Level : S-1 or better.
(4) Species group : 3 (three).
(5) Identification index : No. 42/20.

d. Rough Hardware:
   (1) Provide all necessary nails, screws, etc.
   (2) Nuts and Bolts : FF-B-571.
   (3) Nails : FS. FF-N-101, or may be drive screw or spiral type of standard make.
   (4) Wood Screws : FSFF-S-111.
   (5) Clamps, expansion bolts, expansion screws, washers of standard types as noted.
   (6) For attaching plywood sheathing to metal studs, and steel joists self-drilling, corrosion resistant screws.

e. Preservative Treatment:
   Product and Manufacturer: "Woodlife", Protection Products Manufacturing Co., Kalamazoo, Michigan.
   "Woodtox", Wood Preservers, St. Louis, Missouri.

8. APPLICATION:
   a. General Framing:
      (1) Wood framing not otherwise detailed : two-by-fours or larger dimension lumber as required for supporting members, spaced not over 16 inches on center.
      (2) Refer drawings, details for sizes and spacings.
      (3) Framing : accurately cut and fitted, true to line and level. Shims and wedge not permitted.
      (4) Spiking and nailing : done using largest size spikes and nails practicable, use galvanized nails at all wet areas.
      (5) Bolt nailers and blocking to steel, masonry and concrete members using machine screws, bolts, toggle bolts, expansion type shields or bolts as applicable or as indicated.
      (6) Provide blocking, bucks and framing as necessary and for other trades as required, or as indicated.
      (7) Where finish trim is applied directly to framing members or blocking, such members : perfectly straight, clear and well seasoned.
      (8) Warp or other poor characteristics not allowed.
      (9) Plywood : comply with applicable recommendations contain ed in Form No. E 304, "APA Design/Construction Guide - Residential & Commercial," for types of plywood products and applications indicated.
      (a) Roof decking and soffit attach @ 6" o.c. at panel edges and 12" o.c. @ intermediate supports.
      (10) Preservative Treatment:
      (a)Where lumber or plywood is indicated as "Treated", or is specified herein to be apply agents per manufacturer's recommended instructions treated.

      (b) Wood cants, nailers, curbs, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers and waterproofing : treated.
      (c) Wood sills, sleepers, blocking, furring, stripping and similar concealed members in contact with masonry or concrete, and horizontal wood framing members less than 18" above grade : treated.
      (d) Preservatives with a petroleum vehicle not permitted.
      (e) Preservative material : applied at rate of 3 lbs. per cu. ft. in strict accordance with preservative manufacturer's specifications.
      (f) All sawcuts, borings, etc. : brushed with same preservative used for treatment.
      (g) Treated material noted to be painted : protected from the weather.

(11) Blocking and Bridging:

(a) Install blocking as required to support items of finish and to cut off concealed draft openings, both vertical and horizontal, between ceiling and floor areas.

(b) Bridging:

(1) Install wood cross bridging (not less than 2" x 3" nominal), metal cross bridging of equal strength, or solid blocking between joists where the span exceeds 8' - 0".

(2) Provide maximum distance of 8"-0" between a line of bridging and a bearing.

(3) Cross bridging may be omitted for roof and ceiling joists where the omission is permitted by code, except where otherwise indicated on the Drawings.

(4) Install solid blocking between joists at points of support and wherever sheathing is discontinuous. Blocking may be omitted where joists are supported on metal hangers.

END OF SECTION

1. GENERAL:
   See referenced note in SECTION: SPECIAL CONDITIONS, paragraph 1.

2. DESCRIPTION OF WORK:
   Furnish labor and materials to complete all non-structural, exposed interior and exterior carpentry work not specified in Millwork or Rough Carpentry Sections.

3. RELATED WORK SPECIFIED ELSEWHERE:
   a. Rough Carpentry: SECTION: ROUGH CARPENTRY.

   b. Millwork, Paneling, cabinet work, casework: SECTION: ARCHITECTURAL WOOD WORK.

   c. Painting and Finishing: SECTION: PAINTING AND FINISHING.

4. WORK INSTALLED BUT FURNISHED BY OTHERS:
   a. Architectural Millwork: SECTION: ARCHITECTURAL WOODWORK.

   b. Wood Doors: SECTION: WOOD DOORS.

   c. Finish Hardware: SECTION: FINISH HARDWARE.

   d. It shall be the responsibility of the General Contractor to furnish all misc. items not supplied by others.

5. 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.

   b. Quality Standards:
      Work in all other areas with surfaces exposed to view: Trade standard known as First Grade Workmanship.

6. SUBMITTALS:
   a. Submit shop drawings in accordance with the General and Special Provisions for all specified items of trim, millwork, including items not otherwise specified in SECTION: ARCHITECTURAL WOODWORK.

   b. If products other than that specified, are submitted for approval, product data must accompany submitted items. If drawings are required to explain submittal approval, they should display manufacturer's methods.

   c. Submit manufacturer's descriptive literature for specialty items.

   d. Wood Treatment Data: Submit chemical treatment manufacturer's instructions for proper use of each type of treated material.

e. Substitutions shall be submitted no less than 10 days prior to bid date.

7. PRODUCT DELIVERY, STORAGE AND HANDLING:
   a. Inspect millwork and finish materials (trim, doors, cabinetry, etc.) upon delivery to insure that no scratched, marked, damaged, subgrade, defective or machine-marked pieces are installed.

   b. Arrange to have millwork, finish materials (trim, doors, cabinetry, etc.) and sight exposed studs and nailers receive first coat of painter's finish, primed or backpainted as appropriate immediately upon delivery to project.

   c. 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 unforseen circumstances, finish carpentry materials must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

   d. Finish Hardware:
      (1) Check markings on hardware for proper location. Supplier : mark each item of hardware for location.
      (2) Protect hardware markings until each item is installed.
      (3) If any item of hardware is delivered to the project not properly marked, return it to the supplier for markings before attempting to install it.

8. 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.

9. PRODUCTS:
   a. Wood Product Quality Standards:
      (1) 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.
      (2) Plywood Standard : Comply with PS1.
      (3) Hardwood L umber Standard: Comply with National Hardwood Lumber Association (NHLA) rules.
      (4) Hardwood Plywood Standard: Comply with PS51.
      (5) Woodworking Standard: Where indicated for a specific product comply with specified provision of the following: Architectural Woodwork Institute (AWI) "Quality Standards."
      (6) Glued-up Lumber Standard: Comply with PS56.

   b. 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 L umber: Provide kiln-dried (KD) lumber having a moisture con tent from time of manufacture until time of installation not greater than values required by 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 with in 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.

(6) For exterior finish carpentry work use glued-up lumber complying with PS 56 for "wet use" and certified so by respective grading and inspecting agency for species and product indicated.

c. Plywood:

Except as otherwise specified, all plywood : conform to the following:

(1) Exposed: refer to SECTION: ARCHITECTURAL WOODWORK and ROUGH CARPENTRY.

(2) Concealed: As specified in SECTION: ROUGH CARPENTRY.

(3) Backers for electrical panels, telephone : considered concealed items.

(4) Paneling : 5/32" unfinished birch paneling with matching trim. Glue and nail over gyp bd. per manufacturer's recommendations.

d. Solid wood for grounds: As specified in SECTION: ROUGH CARPENTRY.

e. Solid wood for finish work:

(1) Grade and species as specified in SECTION: ARCHITECTURAL WOODWORK.

(2) Interior Standing and Running Trim and trim for frames at door heads and jambs for Painted Finish: Any species graded and inspected by WWPA complying with following requirements: Grade for Standard Sizes and Pattern: "Choice" F.A.S. Alder.

f. Fasteners:

(1) Galvanized, unless otherwise noted or approved, for all exterior finish carpentry. (ASTHMA-153)

(2) Bolts, Nuts : FS FF-B-575C, FF-N-836C sizes and lengths as detailed or required.

(3) Clamps , expansion bolts, expansion screws, washers of standard type.

(4) Glue for interior work : Grade IICS-171-58.

(5) Wood Screws : FS-FF-S-111.

(6) Nails : FS FF-N-1058 or may be drive screw or spiral type of standard make.

10. INSTALLATION:

a. Inspection:

(1) Prior to installation, carefully inspect all items to be installed. Do not install damaged or defective items.

(2) Verify that fabricator-supplied and installed millwork hardware is complete and properly installed.

(3) Examine all frames backing up specified finish carpentry items. Correct any defects preventing plumb, true and secure installation.

b. Acclimatization of Wood Materials:

(1) Prior to installation, all wood materials provided by this and other sections : stored a minimum of 10 days in protected areas within the building.
(2) Contractor : select and Architect : approve the areas selected.
(3) Maintain temperature of these areas between 50 degrees F. and 75 degrees F.
(4) Store materials in an approved manner to allow free circulation of air around all items.

c. Framing, Anchors and Grounds:
(1) Work not otherwise specified in SECTION: ROUGH CARPENTRY : as herein specified. Accurate to require lines, levels, secure rigidly in place. Cut no framing members for passage of pipes, or conduits without permission from Architect.
(2) Install anchors where required to anchor carpentry to masonry or concrete. Anchor rough bucks in masonry or concrete with 3/16" x 1-1/4" straps, turned up 2" on ends and extend 8" into brick unless otherwise noted. Locate anchors near top and bottom of item not over 36" centers.
(3) Anchors for wall plates not otherwise indicated : 5/8 " bolts, 8" long 48" centers with washers unless otherwise noted.
(4) Furnish dressed wood grounds for securing items to walls, ceilings, as indicated. Anchor grounds in walls and floors as indicated for wood trim, cabinetry, base, etc.
(5) Set grounds rigidly in perfect alignment, true up with long straight edge. Grounds, sized as indicated or as required.

d. Wood Finish Work and Trim:
(1) Nailing: Interior trim less than 4 inches wide 6D casing nails maximum 12 inches on center staggered. Except as detailed or specified.
(2) Install as detailed with mitered corners, unless indicated to have butt joint.

e. Architectural Woodwork:
(1) Refer paragraph "Acclimatization of Wood Materials" above.
(2) Set and install carefully, in workman like manner, in accordance with best trade practice.
(3) Shim as necessary with concealed shims.
(4) Scribe and fit face plates, fillers and trim to adjacent surfaces.
(5) Expansion Joints : worked to permit sections to expand, contract without bucking, warping, causing other conditions which will detract from durability.

f. Wood Doors:
(1) Refer paragraph "Acclimatization of Wood Materials" above. Wood doors and panels : installed as a part of the work of this section.
(2) Materials : as specified in SECTION: WOOD DOORS.
(3) Fit, hang, trim as required. Doors : 1/16" clearance at sides; top : 3/16" over thresholds; for doors in openings without thresholds, provide 3/8" clearance. Hand trim doors with hardware as per "Hardware" section requirements. Install trim supplied by others.

g. Finish Hardware:
(1) Install all hardware as furnished under other sections o f the Specifications for which installation is not otherwise specified.
(2) Provide a lock storage space complete with shelving, for unpacking crates and sorting out hardware. This space : controlled by the General Contractor who : responsible for protection of hardware after it is received on the job.
(3) All hardware : installed by carpenter mechanics, skilled in the application of institutional grade hardware. All instruction sheets and installation details, which are packed with the

hardware : read and understood before any attempt is made to install the hardware.

(a) Install in accordance with manufacturer's details and instructions and make necessary adjustments for proper working order.

(b) Provide clean, properly sized and accurately placed mortises and drilled holes for all mortise and surface mounted finish hardware.

(c) Use appropriate jigs, templates, and power mortising equipment for the installation of all mortised hardware items.

(d) Any hardware damaged by improper adjustment or careless abuse : replaced.

(e) Fit all surfaces applied hardware accurately

. (4) If doors are to be field painted after erection, all hardware : removed from doors by General Contractor, prior to painting. After paint has completely dried, General Contractor : reinstall all hardware in accordance with manufacturer's recommendations.

(5) After installation, all templates, instruction sheets, and installation details : placed in a file folder to be turned over to the Owner when building is accepted.

(6) Wood Doors:

(a) Install locks with standardized cases at same height.

(b) Knob locks, knob latches: Knob center 38" above finished floor unless otherwise specified or directed.

(c) Cylinder dead locks: Cylinder center at same height as center of knob lock cylinder.

(d) Bit key locks: Center keyhole at same height as center of knob lock cylinder.

(e) Coordinate requirements for location of locks, latches, with requirements for location of strikes on metal frames.

(7) Metal frames to receive hardware items : drilled and tapped accurately.

(8) After hardware is installed, protect exposed surfaces by use of heavy paper and masking tape and maintain until project completion.

(9) Removal for Painting:

(a) Before painter's finish is applied, remove all finish hardware, except prime-coated items.

(b) After final paint and finish coats are dry, permanently replace and re-adjust finish hardware for proper operation.

h. Adjustment, Cleaning, Finishing and Protection:

(1) 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.

(2) Clean finish carpentry work on exposed and semi-exposed surfaces. Touch-up shop-applied finishes to restore damaged or soiled areas.

(3) 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

1. GENERAL:
   See referenced note in SECTION: SPECIAL CONDITIONS, paragraph 1.

2. WORK INCLUDED:
   a. Furnish labor and materials to complete millwork and woodwork as indicated, as specified herein or both. Only experienced, capable foreman and mechanics : used.

   b. Inspection: Prior to delivery, inspect all millwork and woodwork to insure that no sub-grade defective machine-marked or otherwise damaged pieces are delivered.

   c. Storage: Store millwork and woodwork in an approved, protected area until proper storage can be provided at project site.

   d. Delivery: Millwork and woodwork : not be delivered until proper storage can be provided at project site. Refer also to Section: FINISH CARPENTRY.

   e. Coordinate fabrication of millwork and woodwork items to allow ample time for fulfilling "Wood Acclimatization" requirements as specified under Section: FINISH CARPENTRY.

   f. Coordinate Cut-outs for hardware, etc. with applicable section. Power mortising equipment : used for mortise work. No hand chiseling permitted.

   g. Construction:
      (1) If certain millwork items specified cannot be fabricated and assembled in the mill shop, this Section : fabricate such items at project site as approved by Architect.
      (2) Deviations from drawings in method of construction and substitution of materials may be permitted only upon approval of Architect and only if these differences retain or increase quality and workability of the millwork, and general appearance of the design is retained.

3. RELATED WORK SPECIFIED ELSEWHERE:
   a. Stripping, blocking, nailers and rough bases not part of cabinets: SECTION: ROUGH CARPENTRY.

   b. Installation of architectural woodwork: SECTION: FINISH CARPENTRY.

   c. Miscellaneous trim and shelving not specified in this section: SECTION: FINISH CARPENTRY.

   d. Wood doors: SECTION: WOOD DOORS.

   e. Finish hardware not furnished by architectural woodwork: SECTION: FINISH HARDWARE.

   f. Painting and finishing : SECTION: PAINTING AND FINISHING.

4. MATERIALS:
   a. General:
      (1) Grades specified : conform to most recent grading rules of Southern Pine Association, The West Coast Lumberman's Association, American Plywood Association, Hardwood

Plywood Association, Architectural Woodwork Institute, or Lumber Manufacturing Association, under whose rules lumber is produced.

(2) Moisture Content: Unless otherwise specified, 1" lumber : either air or kiln dried; moisture content : not be over 19%. Dimension lumber : as per Association Rules for grade, moisture content. Exterior, interior finishing lumber : kiln dried; at time of delivery to premises, moisture content : not over 12% for material 1" or less thick, not over 14% for material over 1" thick. Millwork, assembled or build up or more than one piece at mill, except doors : not over 12% moisture content.

b. Lumber:

(1) Cabinet interior framing, Nailers, Headers : No. 2 Southern Pine (f min. = 1400 p.s.i.) or standard Equal Douglas Fir.

(2) Bases and Grounds : No. 2 Southern Pine (f min. = 1200 p.s.i.)

(3) All trim & exposed finished lumber : select paint grade Birch or F.A.S. Alder, exception : trim at stain grade cabinets : stain grade Red Oak.

c. Materials Other Than Lumber:

(1) Bolts, Nut : FF-B-571.

(2) Clamps, expansion bolts, expansion screws, washers of standard type.

(3) Glue for interior work : Grade II CS-171-58.

(4) Wood screws : FS FF-S-111.

(5) Nails : FF-N-101 or may be drive screw or spiral type of standard make.

d. Plywood: 3/4" thickness unless otherwise noted. A-B, plywood : sound (2), for smooth stain finish with minor defects filled, five-ply minimum, with a "H" - high density, specific gravity of 0.56 or higher, Red Oak as indicated on plans.

e. Hardwood plywood at millwork doors : (H) high density; Type II, Int., water resistant bond, sound grade (2), : seven ply Veneer : stain grade Red Oak. Thicknesses : as indicated on drawings.

f. Plywood : 3/4" thickness unless otherwise noted. A-B, plywood : sound (2) , for smooth paint finish with minor defects filled, five-ply minimum with a "H" - high density, specific gravity of 0.56 or higher, such as White Pine as indicated on plans

g. Fiberboard : for counter tops; 3/4" thick, A-grade 48 lb. density.

h. Compressed Hardboard : 1/4" thick tempered, SIS.

i. Solid Stock: Grade "C" and better Southern or Parana Pine (Framing for drawers).

j. Exposed Solid Stock : Select Red Oak.

k. Sheet Plastic Laminated Surface:

(1) Plastic laminate : Standard gauge, high pressure laminated plastic, preformed where indicated.

(2) Color and Finish : as selected by Architect from manufacturer's standard colors and finishes. Both solid and wood grained colors : used as indicated.

(3) Adhesives : waterproof type as recommended by plastic manufacturer for condition of use.

(4) Manufacturers:
Formica Corporation, Cincinnati, Ohio
Westinghouse, Micarta Division
General Electric "Texolite" Wilsonart

l. Cabinet Hardware:
(1) Related items, covered in Section: FINISH HARDWARE.
(2) Locations - Refer to drawings and details.
(3) Types provide the following:
(a) For each hinged cabinet door:
1 pair hinges; 1 pull; 1 catch, door silencers
(b) For each drawer; 1 pull, see drawings; 2 side drawer guides.
(c) Adjustable shelf standards and brackets as per SECTION Finish Hardware.
(d) Followers in all file cabinets.
(e) Locks as indicated and specified.
(f) Coat rods as indicated.
(4) Cabinet hardware: provided and installed as per the following schedule:

Doors:

1 pr. hinges (Typ.)	Youngdale 5
1 pull	4484 US26D
Locks where required	SIM. KV K987

Drawers:

1 set Drawer Glides	SeriesKV1300
1 Pull	4484 US26D
Locks where required	KV987

Adjustable shelving:

Standards	Series KV255
with Brackets	Series KV256

File Cabinets:

Followers	KV 476 FZC
Track	KV 476 TIC

Clothes Rods @Wardrobe Cabinets;

Rod (Tube)	KV 660SS
Flange	KV 735

Display Cases:

Track Assembly	KV1093 Upper & Lower Channels
	KV1097 Rollers
	KV1085 Vinyl Glides
	KV1095 Shoe
	KV1096 Track

Shelf Standards	KV 8 7 ANO
Brackets	KV 187 ANO
Lock	KV 963 CHR

5. APPLICATION:

a. Workmanship:

(1) To permit fabricator of millwork to utilize his manufacturing technique to best advantage, details of millwork construction are not shown on the drawings, but it is intent of these specifications to require items of millwork, complete and finish with the highest degree of workmanship. In general, millwork ; completely fabricated at the shop as far as possible and delivered ready to set in place in largest units consistent with convenient erection.

(2) Work material in best manner, using dado, rabbet, lap, shoulder lap, and other joints as indicated, glued to provide greatest strength and using minimum of nails and screws. If used, nails and screws must b e concealed. Use glue clamps. Make mitered corners using cutter head on shaper that will provide interlocking joints.

(3) As required, fabricate certain parts of millwork at project site.

(4) Natural finish materials : have job sanded square edges.

(5) Provide edging on plywood exposed edges. Edging : run continuous and be solid matching material. Edging : glued solidly.

(6) Provide millwork with fine sand paper finish ready for paint finishing. No sanding across grain permitted.

(7) Install plastic top and edge on cabinets to Plywood with waterproof adhesive as recommended and specified by manufacturer of plastic used.

(8) Provision : made for job application of plastic surfacing onto counter tops if cabinet is too large to move into room because of space limitations. Joints in laminated plastic : inconspicuous.

(9) On trim 3/4 inch x 1-1/2 inch and over, kerf the back side with sawed rout not to exceed 3/4" on center.

b. Millwork :

accurately milled to details, clean cut moldings, profiles, lines; scrape, sand, smooth; mortise, tenon, spline, house, joint, block, nail, screw, bolt together, as approved, in manner to allow free play of panels; avoid swelling, shrinkage, insure work remaining in place without warping, splitting, opening of joints.

c. Setting: Secure work to grounds, otherwise fasten i n position to hold correct surfaces, lines, levels. Make finished work flat, plumb, true.

d. Loose Joints: Use judgment in locating loose joints to render them inconspicuous as possible in finished work. Make joints with rail bolts than can be pulled up tight to form perfect joints.

e. Fastenings: As far as possible conceal fastenings; where not possible, locate them in inconspicuous places. Where nailing is permitted through woodwork face, conceal nail heads.

f. Expansion Joints : worked to permit section to expand, contract without buckling, warping, causing other conditions which will detract from appearance, durability.

g. Miter external corners of flat horizontal members; house internal corners. Miter external corners of molded members; cope internal corners. Glue mitered corners; secure with corrugated metal fasteners.

h. Mill moldings to true profiles; make perfectly smooth on exposed surfaces.

6. MILLWORK ITEMS:
   a. Wood grounds for securing items to walls, ceilings : indicated as specified under other sections of these specifications.
   b. Wall and Base Cabinets:
      (1) Framing as specified; stiles and other trim surfaces : "C" and better Southern Pine or Parana.
      (2) Edges of plywood to receive plastic laminate : banded with 1/4" x 3/4" "C" or better Southern Pine or Parana.
      (3) Plywood: Shelving as indicated on drawings : 3/4" thick Int. A-B plywood and surface will be painted.
      (4) Plastic Laminate : applied to surfaces as indicated on drawings.
      (5) Plywood for cabinet sides : 3/4"thick, to accept dado connection for shelves and to receive stain, DFPA-A-B.
      (6) Plywood for cabinet backs : 1/4" thick - DFPA-A-B.

   c. Drawers:
      (1) Compressed Hardboard : 1/4" thick and used at bottom of drawers.
      (2) Solid stock : "C" and better Southern Pine or Parana for sides and backs.
      (3) Fronts : 3/4" plywood DFPA-A-B. Veneer : Stain Grade Red Oak.

   d. Closet Shelving:
      (1) Plywood: 3/4" thick unless otherwise indicated on plans, Int. A-B plywood and surface will be painted.
      (2) Solid Stock : "C" and better Southern Pine or Parana.

   e. Other items as detailed on plans.

7. SHOP DRAWINGS:
   Submit shop drawings of work therein specified as per "Uniform General Conditions" of these specifications in Six (6) copies.

END OF SECTION

1. GENERAL:
   See referenced note in SECTION: "SPECIAL CONDITIONS", paragraph 1.

2. WORK INCLUDED:
   This section covers furnishing and installation of thermal & acoustical building insulation in walls as indicated and specified.

3. RELATED WORK SPECIFIED ELSEWHERE:
   a. Stud Framing: SECTION: GYPSUM WALLBOARD CONSTRUCTION.

   b. Mechanical System Insulation: SECTION: MECHANICAL.

4. QUALITY ASSURANCE:
   a. Acceptable Manufacturers; Coordinate the work under this section with stud framing work and metal building unit work. Acceptable Manufacturers are:
      (1) Owens-Corning Fiberglas
      (2) Johns-Mansvile
      (3) Certainteed

   b. Comply with fire-resistance, flammability and insurance ratings indicated and comply with code interpretations by governing authorities.

5. MATERIALS:
   a. Exterior 3-1/2" Wall Insulation: Actual installed thickness of wall insulation : three and one-half inches (3-1/2") thick or such to provide a coefficient of heat transmission or U-Value through the completed wall construction Air-to-Air, not in excess of 0.08 BTU per hour, per square foot, per degree F. Temperature difference, when determined for winter conditions in accordance with recognized methods in agreement with ASHRAE Handbook of Fundamentals, whichever is greater. Pro vide mineral fiber batt or blanket insulation consisting of glass or other inorganic fibers and resinous binders formed into flexible blankets of semi-rigid sheets, complying with ASTM C665, Type I; manufacturer's standard sizes for use with metal or wood stud framing. Insulation blankets : Unfaced.

   b. Exterior 6" Wall Insulation: Actual installed thickness of wall insulation : six inches (6") thick or such to provide a coefficient of heat transmission or U-Valve through the completed wall construction Air-to-Air, not in excess of 0.05 BTU per hour, per square foot, per degree F. Temperature difference, when determined for winter conditions in accordance with recognized methods in agreement with ASHRAE Handbook of Fundamentals, whichever is greater. Provide mineral fiber batt or blanket insulation consisting of glass or other inorganic fibers and resinous binders formed into flexible blankets of semi-rigid sheets, complying with ASTM C665 Type I; manufacturer's standard sizes for use with metal or wood stud framing. Insulation blankets : Unfaced.

   c. Interior sound control batts : designed for sound control applications in lightweight partitions. Actual installed thickness : three and one-half (3-1/2") thick. Provide unfaced mineral fiber batt or blanket insulation consisting of glass or other inorganic fibers and resinous binders formed into flexible blankets or semi-rigid sheets complying with FS HH-1-521F, T ype I, Type manufacturer's standard sizes for use with wood or metal stud framing.

d. Miscellaneous Materials:
   (1) Adhesive for Bonding Insulation: The type recommended by the insulation manufacturer and complying with fire-resistant requirements and insurance requirements.
   (2) Mechanical Anchors: Berryfast/Insulfast Nail/Disc System or Lexsuco clips with discs.
   (3) Tape recommended by manufacturer to tape joints between insulation blankets to maintain continuous vapor barrier.

6. STORAGE:
Do not allow insulation materials to become wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.

7. INSTALLATION:
   a. 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 project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work.

   b. Batt insulation : installed to completely fill the height and width of the stud cavity. Tightly butt ends and sides of blankets within a cavity and fit blankets carefully behind electrical outlets, bracing, fixture attachments, etc.

8. INSPECTION:
Immediately prior to installation, examine stud framing for suitability for installation, including regularity and spacing. Do not proceed with installation until conditions which will not allow snug or friction fitting of installation as recommended are corrected.

9. SUBMITTALS:
In addition to requirements as specified in SECTION: SPECIAL CONDITIONS, submit 2 copies of manufacturer's specifications and installation instructions for each type of insulation required. Include data substantiating that materials comply with specified requirements.

10. CLEANUP:
At the completion of each day's installation, all debris : removed and the premises left in a clean condition.

END OF SECTION

1. GENERAL:
   See referenced note in SECTION: SPECIAL CONDITION, paragraph 1.

2. WORK INCLUDED:
   Furnish labor and materials to complete caulking and sealing with backing as indicated and specified herein, and/or both.

3. RELATED WORK SPECIFIED ELSEWHERE:
   a. Hollow metal frames: SECTION: HOLLOW METAL DOORS AND FRAMES.

   b. Concrete slabs and joints: SECTION: CONCRETE.

   c. Thresholds: SECTION: FINISH HARDWARE.

   d. Drywall work: SECTION: GYPSUM DRYWALL CONSTRUCTION.

   e. Painting: SECTION: PAINTING AND FINISHING.

   f. Masonry work: SECTION: MASONRY WORK.

   g. Flashing: SECTION: FLASHING AND SHEET METAL.

   h. Windows: SECTION: WOOD & PLASTIC WINDOWS.

   i. Entrances: SECTION: ALUMINUM ENTRANCES.

4. SUBMITTALS:
   Provide one information sheet of each type of sealant proposed for exterior of building.

5. MATERIALS:
   a. Caulking compound "Type A": one part of polymerized butyl rubber compound gun consistency, conforming to applicable requirements of Federal Specification TT-S-001657 (Type 1). Color appropriate to installation. Manufacturers:
      (1) Sonneborn Building Product, Inc., "Butakauk"
      (2) Pecora, Inc., "BC-158" (Gun Grade)
      (3) W.R. Grace (A.C. Horn), "Hornseal"
      (4) Tremco Butyl Sealant

   b. Caulking compound "Type B": one part of 100% liquid polymer, acrylic base compound, non-sagging, non-staining, F.S. TT-S-00230, Type II, AAMA 808.27, gun consistency, Manufacturers:
      (1) Tremco Manufacturing Co., Cleveland, Ohio 44104 (Mo no)
      (2) Pecora-60 + Unicrylic Sealant.
      (3) DAP, Inc.; Acrylic Polymeric Sealant.
      (4) Sonneborn NPJ.

   c. Rubberbase compound (RBC) - Compound : a two-component, elastomeric, sealing compound :

comply with requirements of USASI Specification A-116.1, Class B (non-sag) and Federal Specification TT-S-00227, Type I and II : accompanied by manufacturer's certificate stating that compound complies with this standard. Class "A" for horizontal joints, C lass "B" (non-sag) for vertical joints. Manufacturers:

(1) Sonneborn Building Products, Inc. (Sonolastic Sealant)(Two-Part)
(2) Pecora, Inc. (GC-5)
(3) Tremco Manufacturing Co. (Lasto-Meric @ non porous-Dymeric @ concrete)
(4) Thiokol Chemical Corporation

A urethane based compound, one or two part may be substituted for rubber based compound. Manufacturer's acceptable:

(1) Sonneborn Building Products, Inc.
(2) Pecora, Inc.

d. Silicone Based Compound (SBC) - One part, silicone rubber base sealing compound complying with applicable requirements of Federal Specification TT-S-001543A. Sealant : same color as adjacent materials.
Manufacturers:
(1) Dow Corning Corp., "Dow Corning 790"
(2) General Electric, "Gesil N"
(3) Pecora Corp oration, Pecora 864,"Architectural Silicone Sealant"

e. Rod Stock Backup (interior joints): Flexible, closed cell, expanded polyethylene round rodding backer rod, 1-1/3 times joint width in diameter conforming to Federal Specification HH-F-341, Type I, Class A and B. "Ethafoam-SB" as manufactured by Dow Corning Corporation, or equal.

f. Back-Up Materials:
(1) Back-up material for interior joints : compressible (similar to e. above) Non-impregnated type material, free from oil and asphaltic products. Back-up material : approved by manufacturer of joint compound used.
(2) Back-up materials for exterior joints : "Sonoflex F" foam expansion joint filler or approved equal.

g. Primers: Type of primer : as recommended by joint compound manufacturer for condition of use, and : as approved.

h. Group "C" caulking and sealing compound material : conform to following requirements.

Type 3 sealant compound : One - or Two-part, polyurethane type sealant, suitable for sealing horizontal joints in surfaces subject to pedestrian and vehicular traffic, hard curing type, non-staining; in standard gray colors as selected by Architect. Manufacturers:

(1) W.R. Grace, Daraseal - U Traffic Grade.
(2) Sonneborn Sonolastic; Paving Joint Sealant.
(3) Dynatrol II, Urexpan; Pecora Corp.

j. Acoustical Sealant: Continuous bead of POLYSOBUTYLENE - BASE MASTIC Continuous bead of non-drying, non-skinning, non-hardening non-migrating, heavy bodied sealant. Acceptable Manufacturers:

USG - Acoustical Sealant
PecoraTremco
W.W. Henry

k. Compressible Filler: Elastomeric neoprene compression seal for Vertical application. Color to be selected by Architect. Acceptable Manufacturers:
   (1) Acmaseal by Acme.
   (2) Watson/Bowman Associates
   (3) Balco

6. LOCATION:
   a. General - Caulking : provided at joints and recesses in exterior and interior construction where sealing is required to prevent infiltration of water, moisture, wind and sound or light passage through such joints and recesses. Locations : include but not necessarily be limited to following listed locations.

   b. Caulking Compound "Type A" (Interior joints):
      (1) Concealed interior joints (not sight exposed).
      (2) Exterior and interior metal thresholds, saddles and sills.
      (3) Joints and recesses between access panels, electric panels, piping, pipe sleeves, etc., which occur in interior ceilings.
      (4) Joints (10' or more above floor line) at interior wall materials which adjoin columns, concrete block, pilasters, slabs, or exterior walls, exception as detailed.

   c. Caulking Compound "Type B": Paintable. (Interior Joints)
      (1) Interior sight exposed framing cracks and joints (not otherwise specified or detailed) as required to insure tight, lightproof construction below 10' level. Joint size limitation 1/4" width x 1/4" deep maximum w 1/4" min.
      (2) Joints and recesses between metal frames and interior gypsum board, except as otherwise specified.
      (3) Joints (to maximum height of 10') at gypsum board walls which adjoin columns, pilasters and exterior walls, and at interior masonry control joints.
      (4) Interior sight exposed joints not otherwise specified.
      (5) Painted joints.

   d. Rubber Base Compound: (Exterior Joints) All exterior joints and openings where sealant is required to provide on drawings as sealant. All slab expansion joints form ed with preformed fiber fillers where not otherwise noted. All exposed mortar joints at concrete masonry unit expansion joints and joints between CMU and dissimilar materials. Use at expansion joints on exterior of building. Colors to be selected by Architect.

   e. Silicone Sealant: (Interior and Exterior Joints)
      (1) Silicone based compound may also be used at Contractor's option in lieu of rubber base compound for joints less than 1" wide.
      (2) Between cabinet backsplash and wall and between cabinet top and backsplash.
      (3) At sight exposed joints on interior and exterior faces of concrete columns, fascia beams, buttress panels, beams and columns including poured-in place concrete.
   f. Sealants for Group "C" or type "C" sealants : at sidewalk and sidewalk to wall joint as detailed. Also, to be used at automobile parking areas in which sealant is required at parking surface.

g. Rod Stock Back-Up: Provide as separating backup for caulking materials used in conjunction with waterproof compressible filler and other incompatible materials.

h. Urethane base compound: May be substituted for RBC. Same locations as in 6D above. Expansion joint at foundation wall and slab at perimeter of building : sealed wit h 2 part urethane sealant as per manufacturer's recommendations or as follows:
   (1) 3/8" primer directly on top of joint filler.
   (2) 3/8" of sealant directly on top of primer to fill out to top of joint.

i. Compressible Filler: Joints wider than one inch and where noted on the plans as compressible filler. See plans.

7. APPLICATION:
   a. General:
      (1) Contractor : submit brand name or number and manufacturer of each type of joint compound he proposes to use for Architect's approval and color selection prior to starting work of this section.
      (2) Before applying joint compounds, surfaces : absolutely clean of dirt, grease, loose materials and foreign matter.
      (3) Tape facing surfaces adjacent to joints before applying joint compounds.
      (4) Primers : applied in strict accordance with manufacturer's printed instructions.
      (5) Apply back-up materials, caulking and sealants in strict accordance with joint compound manufacturer's printed instructions.
      (6) Joint compound in sight exposed locations : tooled smooth as recommended by joint compound manufacturer and recessed 1/8" from face of metal jambs.

   b. Caulking Compound "Type B" (Acrylic)(1)Install back-up material as detailed an d as required to provide properly shaped joint conformations.(2)Except as approved by Architect, compound : not be installed in joints wider than 1/4" with 1/4" depth.

   c. Caulking Compound "Type A" (Butyl):
      (1) Install as detailed and as required to provide joints of greater depth than width. Adjust back-up materials accordingly.
      (2) Except as approved by Architect, compound : not be installed in joints wider than 3/4" with 3/8" depth, and 1/2" wide with 1/4" depth.

   d. Rubber Base Compound:
      (1) Manufacturer's directions: followed closely in preparing, storing and applying joint compound and in use of primers.
      (2) Compound: applied with air gun to form flexible sealed joints, expansion joints, and other joints, as shown on drawings.
      (3) Do not disturb compound by touching, washing or otherwise until it has cured tack free.
      (4) Excess compound : removed from surfaces after curing.
      (5) Smooth uneven surfaces as directed.
      (6) Back-up joints with compressible materials as approved by Architect and as recommended by compound manufacturer.
      (7) If option for silicone base compound is used in lieu of rubber base compound, see e. below.
      (8) Joint design : in strict accordance with compound manufacturer's published recommendations. In no case : joint depth (of compound) exceed width dimensions of

joint. Adjust back-up material accordingly.

(9) If option for urethane based compound is used in lieu of rubber based compound; see f. below.

e. Silicone Base Compound (SBC):
(1) Silicone base compound : applied in strict accordance with manufacturer's printed instructions. Except as approved by Architect, silicone base : not installed in joints wider than 1".
(2) Joint design : in strict accordance with compound manufacturer's published recommendations. In no case : joint depth (o f compound) exceed 2/3 width dimension of joint. Adjust back-up material accordingly.

f. Urethane based one or two part sealant : applied in strict accordance with manufacturer's published recommendations. Joint design based on manufacturer's recommendations and back-up materials accordingly.

g. Joint Dimensions:
(1) Width or depth of open joints : not less than 1/4". In joints up to 1/2" in width, depth of compound in joint : same as width,; i.e., 3/8" wide by 3/8" deep, 1/2" wide by 1 /2" deep.
(2) In open joints over 1/2" i n width, depth of compound : approximately 1/2 width, but in any case not less than 1/2"; i.e., 3/4" wide by 1/2" deep; 1" wide by 1/2" deep, 1-1/2" wide by 3/4" deep.
(3) When open joints, before caulking, exceed above specified depth requirements for compound, pack joint with back-up material to correct type and to depth as necessary to provide specified sealant depth.
(4) On sidewalk joints that are to be caulked an d do not have built-in stop or other means to prevent depth of compound from exceeding 1/2", pack joint with back-up materials of correct type and to depth as necessary to provide minimum 3/8" and maxi mum 1/2" depth of compound.

h. Priming: When conditions of joints so require, or types of materials used adjacent to joints so require, or when compound manufacturer's recommendations so require, clean an d prime joints before starting caulking. Execute priming operations in strict accordance with manufacturer's directions.

8. CLEANING UP:
At completion of operations, clean work of other trades that has, in anyway, been soiled by these operations. Remove from jobsite excess materials, containers and refuse.

9. DEFECTIVE WORK:
a. Repair and/or replace defective work, and other work damaged thereby, which becomes defective during guarantee term, without extra cost to Owner.

b. Defects caused by failure of work of other trades, if such defects were impossible to detect at time of examination of other trades' work : not considered defect of this work.

c. Leakage, hardening, cracking, crumbling, melting, shrinkage or running of caulking, or staining of adjacent work resultant from sealing and caulking work will be adjudged as failures caused by defective work.

END OF SECTION

1. GENERAL:
See referenced note in SECTION: SPECIAL CONDITIONS, paragraph 1.

2. WORK INCLUDED:
Furnish all necessary materials, labor, and equipment for complete installation of aluminum entrances including doors, frames, hardware and necessary anchors and accessories as shown on the drawings and specified herein.

3. RELATED WORK SPECIFIED ELSEWHERE:
   a. Glass and Glazing: SECTION: GLASS AND GLAZING.

   b. Lock Cylinders and Thresholds: SECTION: FINISH HARDWARE.

   c. Caulking and Sealants: SECTION: CAULKING AND SEALANTS.

4. QUALITY ASSURANCE:
For purposes of designating type, quality for work of this section, drawings and specifications are based upon the TRIFAB 451T framing system as manufactured by the Kawneer Company, Inc. with '350' series doors.

5. SUBMITTALS:
   a. Shop drawings and samples: submitted as required by General Conditions.

   b. Provide a 6" long sample of vinyl glazing bead attached to 6" long piece of frame member. Provide a 6" long piece of the framing system of the finished aluminum.

6. MATERIALS:
   a. Extrusions: 6063-T5 alloy, and temper (ASTM B221 ALLOY G.S. 10A-T5). Fasteners, where exposed: aluminum, stainless steel or zinc plated steel in accordance with ASTM A 164. Perimeter anchors: aluminum.

   b. Glazing gaskets: EPDM elastomeric extrusions.

   c. Doors: Kawneer "350" medium style single-acting swing doors to accommodate Kawneer Paneline panic hardware with Trifab 451 frame system. Door sizes: as scheduled on drawings.

   d. Framing system: provide for flush glazing on all sides with no projecting stops. Vertical and horizontal framing members: have a nominal face dimension of 2". Overall depth: 4 1/2" with a 1 5/16" glass pocket. **Provide end caps at all sill flashings.** Entrance framing: compatible with glass framing in appearance. All single-acting entrance frames: include the Sealair positive weather barrier.

7 . HARDWARE:
   a. All aluminum entrance doors in this section to have Kawneer top, bottom and intermediate offset pivots for use with SAM-II concealed overhead closer.

   b. Closers typical at each leaf to be Kawneer SAM-II single-acting manual concealed overhead closer (Husky).

c. Exit device on outside entrance doors: Kawneer Paneline CR-90 concealed rod device with mortise lock cylinder with CO-9 pull.

d. Door weathering: metal backed pile cloth with the bottom rail weathered with EPDM blade gasket sweep strip applied with concealed fasteners.

8. FINISH:
   a. All exposed doors and grid framing: free from scratches and other serious surface blemishes.

   b. Finish shall be Permanodic color #40 Dark Bronze, and Architectural Class I Anodic Coating with intergral Color AA-MI2C22A42.

9. ERECTION:
   a. All items under this section shall be set in their correct locations and shall be level, square, plumb and at proper elevations in alignment with other work.

   b. All joints between interior metal and masonry and between interior glass and entrance framing and mullion members shall be tightly caulked and sealed in order to secure a watertight job.
   c. All materials: screwed in place using backing, masonry plugs or anchors straps as required.

   d. When moldings are joined they shall be accurately cut and fitted to result in a tightly closed joint.

10. CLEANING:
    Contractor under this section: responsible for removal of protective, materials and cleaning with plain water or water with soap or household detergent. Contractor : held responsible for damages resulting from the use of cleaning materials.

END OF SECTION

1. GENERAL:
See referenced note in SECTION: SPECIAL CONDITIONS, paragraph 1.

2. WORK INCLUDED:
Furnish all necessary materials, labor, and equipment for complete installation of wood and plastic windows, necessary anchors, and accessories as shown on the drawings and specified herein.

3. RELATED WORK SPECIFIED ELSEWHERE:
   a. Caulking and Sealants: SECTION: CAULKING AND SEALANTS.

   b. Masonry Work: SECTION: MASONRY WORK.

4. QUALITY ASSURANCE:
For purposes of designating type, quality for work of this section, drawings and specifications are based upon the Andersen windows to match existing windows as manufactured by Andersen Corporation, Bayport, Minnesota.

5. SUBMITTALS:
Shop drawings and samples: submitted as required by General Conditions.

6. MATERIALS:
   a. Casemaster units:
      (1) Frame: Dri-vac water-repellent preservative treated clear Western Ponderosa Pine. Thickness: 1-3/8" and frame width: 4-9/16".
      (2) Sash: Dri-vac water-repellent preservative treated clear Western Ponderosa Pine with sash thickness of 1-3/4". Corners: mortised and tenioned.
      (3) Exterior Wood Trim: 1-1/4" x 2" brick mould casing, factory applied.
      (4) Hardware: as manufactured by Truth Tool Company and: factory installed. High pressure zinc die-cast case, crank handle and knob. Hardened steel drive worm and gear arm with "Easy-detach" arm feature. Cam action sash lock bolt: heat treated steel. Color of hardware: bronze. Two locks: installed on 56", 64", and 72" high series.(5) Glazing: select quality glazed by means of removable wood stops. Glass: 1\2" insulating Solarbronze.
      (6) Weatherstripping: consist of double weatherstripping with a leaf-type Polypropylene weatherstripping continuous around perimeter of both frame and sash.
      (7) Screen: char coal color fiberglass screen cloth, 18 x 16 mesh set in bronze-tone aluminum frame, factory installed on all operating units.
      (8) Exterior finish: Polycron finish in white (XL-72).
      (9) Interior finish: white acrylic latex prime coat.

   b. Round Tops:
      (1) Frame: Dri-vac water-repellent preservative treated clear laminated Western Ponderosa Pine. Frame: three pieces of laminated stock finish to overall thickness of 11/16" with overall frame width of 4-9/16".
      (2) Sash: Dri-vac water-repellent preservative treated clear Western Ponderosa Pine. Sash thickness: 1 3/4".
      (3) Exterior wood trim: 6/4 x 2" brick mould casing factory applied.

(4) Glazing: select quality 1/2" insulated solar bronze glass with authentic divided lite in sash as shown on drawings.
(5) Sizes: full radius as shown on drawings to match up with casemaster units.
(6) Exterior finish: Polycron finish in white (XL-72).
(7) Interior finish: white acrylic latex prime coat.

7. ERECTION:

a. All items under this section shall be set in their correct locations and shall be level, square, plumb and at proper elevations in alignment with other work.

b. All joints between interior metal and masonry and between interior glass and entrance framing and mullion members shall be tightly caulked and sealed in order to secure a watertight job.

c. All materials: screwed in place using backing, masonry plugs or anchor straps as required.

d. When moldings are joined they shall be accurately cut and fitted to result in a tightly closed joint.

8. CLEANING:

Contractor under this section: responsible for removal of protective, materials and cleaning with plain water or water with soap or household detergent. Contractor: held responsible for damages resulting from the use of cleaning materials.

END OF SECTION

1. GENERAL:
   See referenced note in SECTION: SPECIAL CONDITIONS, paragraph 1.

2. WORK INCLUDED:
   Furnish labor and materials to complete gypsum board wall construction as indicated and specified.

3. RELATED WORK SPECIFIED ELSEWHERE:
   a. Rough Carpentry: SECTION: ROUGH CARPENTRY.

   b. Millwork: SECTION: FINISH CARPENTRY & ARCHITECTURAL WOODWORK.

   c. Architectural Woodwork: SECTION: ARCHITECTURAL WOODWORK.

   d. Painting: SECTION: PAINTING AND FINISHING.

   e. Mechanical Basic Materials and Equipment: DIVISION: MECHANICAL.

   f. Electrical Basic Materials and Equipment: DIVISION: ELECTRICAL.

4. QUALITY ASSURANCE:
   a. Standard of Quality and Performance:
      Methods and materials specified are based on United States Gypsum Company products and procedures, unless otherwise noted. The complete drywall construction system and components, : the products of a single manufacturer. Exceptions are items specifically noted by manufacturers other than USG.

   b. Acceptable Manufacturers:
      United States Gypsum Company (Standard of Quality)
      Gold Bond Building Products, a National Gypsum Company Division
      The Flintkote Company

   c. Code and Insurance Related Requirements; Factory Mutual, Inc., Fire Hazard Classification.

   d. Testing:
      Fire resistance : ASTM E119.

   e. Coordination Among Trades:
      (1) Schedule and coordinate work to allow electrical and mechanical trades to hang wires, place conduit, and install their framing between completion of framing and beginning of gypsum board installation.
      (2) Keep holes in gypsum board application to a minimum with joints in boards tight around penetrations.
      (3) Where braces for fixtures and equipment tie to structure, make sure braces are installed prior to beginning gypsum board application.

5. SUBMITTALS:
   a. Test Reports:

(1) Submit copies of fire test report on fire-rated gypsum board wall assemblies as indicated.
(2) Certified test reports of other acceptable testing agencies which perform testing in accordance with ASTM E119 are acceptable.

6. PRODUCT DELIVERY, STORAGE, AND HANDLING:
   a. Delivery and Handling:
      (1) Deliver materials to the project site with manufacturer's labels intact and legible.
      (2) Handle materials with care to prevent damage.

   b. Storage:
      (1) Store materials inside under cover, stack flat, off floor.
      (2) Stack wallboard so that long lengths are not over short lengths.
      (3) Avoid overloading floor system.
      (4) Store adhesives in dry area, provide protection against freezing at all times.

7. JOB CONDITIONS:
   a. Environmental Conditions:
      (1) Temperature: During cold weather, in areas receiving wallboard installation, maintain temperature range between 55` F to 70` F (13` C to 21` C) for 24 hours before, during and after gypsum wallboard and joint treatment application.
      (2) Ventilation:
         (a) Provide ventilation during and following adhesives and joint treatment applications.
         (b) Use temporary air circulators in enclosed areas lacking natural ventilation.
         (c) Under slow drying conditions, allow additional drying time between coats of joint treatment.
         (d) Protect installed materials from drafts during hot, dry weather.

   b. Protection: Protect adjacent surfaces against damage and stains.

8. MATERIALS:
   a. Gypsum Board:
      (1) Conform to ASTM C36, "Specification for Gypsum Wallboard".
      (2) Tapered edge gypsum board standard 1/2" thick : USG "Sheetrock" or approved equal, as indicated.
      (3) Thickness : 1/2" throughout except where noted.
      (4) Tapered edge fire rated gypsum board : USG "Fire code" sheetrock or approved equal at rated walls and at all ceilings as indicated on plans : 1/2" thick.
      (5) Gypsum board in all damp areas : WATER RESISTANT (W/R) type suitable for this type installation.
      (6) Except as otherwise specified, provide in 48" widths and in as long lengths as possible.

   b. Accessories:
      (1) At all external corners with single layer gypsum board - similar to USG Mp/101 DUR-A-BEAD corner reinforcement, 1" x 1" angles.
      (2) At all exposed edges - similar to USG No. 200-B metal trim.

   c. Fasteners:
      (1) Nails:
      For fastening gypsum board to wood framing, blocking, and studs -

1-3/8 " annular ring nail, similar to GWB-54.

(2) Screws :
  (a) For fastening gypsum board to sheet metal, steel framing, furring, and studs - similar to USG Type "S" Drywall Bungle Head Screws. Length as recommended by Gypsum Board Manufacturer for condition of use.
  (b) For fastening sheet metal to sheet metal - similar to USG Type "S" pan head screws.

d. Adhesives:
Gypsum Board Adhesive: Durabond 200 at minor framing irregularities.

e. Joint Treatment Materials:
(1) Taping, Floating and Laminating Compound:
USG PERF-A-TAPE compound taping, ready mixed or if optional rounded edge gypsum board is used, USG durabond 90 joint compound.
(2) Laminating Adhesive:
USG laminating adhesive.
(3) Joint Reinforcement:
USG PERF-A-TAPE

f. Edge Sealant - USG Sheet rock Brand W/R sealant : used on all edges of W/R sheetrock where cut in field.

g. Sheet Metal Angles, Plates and Braces attached to Drywall Construction : Galvanized Steel, Gauges and Sizes as detailed.

h. Exterior Sheathing Board:
  a. ½" DensGlass Gold Exterior Guard (5/8" thickness required for stud spacing over 16" o.c.).
  b. Manufactured by G-P Gypsum
  c. Sheet Size : 4' x 8', 9', or 10'.
  d. Composition: Gypsum sheathing manufactured in accordance with ASTM C 1177 with glass mats both sides and long edges, water - resistant treated core.
  e. Fire Resistance: Noncombustible when tested in accordance with ASTM E 136. Flame spread 10, smoke developed 0 when tested in accordance with ASTM E 84.
  f. Screws, metal or wood framing:
    a. Type W, 1 1/4" rust-resistant, bugle head, coarse thread, sharp point for wood.
    b. Type S, 1 1/4" rust-resistant, bugle head, fine thread, sharp point, for light-gauge metal framing.

i. Building Wrap:
  a. Dupont Tyvek Commercial Wrap.
  b. Manufactured by : Dupont Weatherization Systems.
  c. Composition: A flash spun bonded olefin, non-woven, non-perforated secondary weather resistant barrier.
  d. Performance Characteristics:
    a. AATCC-127, Water Penetration Resistance, exceeded at 280.
    b. TAPPI T-460, Gurley Hill (sec/100cc) Air infiltration at > 1500 seconds.
    c. ASTM E 96 Method B (g/m2-24 hr.) Water vapor transmission of 200
    d. TAPPI T-41D, Basis weight of 2.7 oz/yd.
    e. ASTM E 96 Method B, Water Vapor Transmission, 28 perms

f. ASTM E 1677, Air Retarder Material Standard Specification, Type I air barrier

e. Sealing Tape / Fasteners:

a. DuPont [tm] Tyvek® Tape, Dupont Weatherization Systems.

b. For steel frame construction: DuPont [tm] Tyvek® Wrap Cap Screws. DuPont Weatherization Systems. 1 5/8" rust resistant screws with 2" diameter plastic cap.

c. For wood frame construction: DuPont [tm] Tyvek® Wrap Caps, DuPont Weatherization Systems. Nails with large heads or plastic washers.

d. Caulks or Sealants: Polyurethane or Elastomeric Sealants:

a. Available Products:

- OSI® Quad Pro-Series®, Solvent release butyl rubber sealant.
- DAP® Dynaflex 230 [tm]
- Other products as approved and recommended by air barrier/weather resistant barrier manufacturer.

9. INSPECTION:

a. Check framing for accurate spacing and alignment.

b. Verify that spacing of installed framing does not exceed maximum allowable for thickness of wallboard to be used.

c. Verify that frames are set for thickness of wallboard to be used.

d. Do not proceed with installation of wallboard until deficiencies are corrected and surfaces to receive wallboard are acceptable.

e. Protrusions of framing, twisted framing members, or unaligned members must be repaired before installation of wallboard is started.

10. APPLICATION:

a. Gypsum Board:

(1) Gypsum wall board : applied with long dimension parallel to framing members.

(2) All abutting ends and edges : occur over supports.

(3) Boards of maximum practical lengths : used to minimize end joint.

(4) End joints : neatly fitted and staggered.

(5) Joints on opposite sides of partition : so arranged as to occur on different studs.

(6) Nailing:

(a) Nails : spaced not to exceed 7" o.c. on ceilings or 8" o.c. on sidewalls.

(b) Nails : a minimum of 3/8" and a maximum of 1/2" from edges and ends of wallboard.

(7) Screw Fasteners:

(a) 1 inch USG Drywall Screw Type "S", : spaced 12" on center at each support in field of board and 8" on center at edges.

(b) Stagger screws at adjacent abutting edges.

(c) Screws : power-driven with an electric screw driver and screw heads : provide a slight depression below surface of wall board.

b Sheathing: Provide exterior sheathing board where shown. Install sheathing in accordance with manufacturer's instructions. Install with gold side out. Use maximum lengths possible to minimize number of joints. Attach sheathing to framing with screws spaced 8" o.c. at perimeter

framing and 8" o.c. along intermediate framing in field. Drive fasteners to bear tight against and flush with surface of sheathing. Do not countersink. Locate fasteners minimum 3/8" from edges and ends of sheathing panels.

c. Building Wrap: Install Air Barrier over exterior side of exterior sheathing board.
   (1) Install Air Barrier after sheathing is installed and before windows and doors are installed. Install lower level barrier prior to upper layers to ensure proper shingling of layers.
   (2) Overlap Air Barrier at corners of building by a minimum of 12 inches.
   (3) Overlap Air Barrier vertical seams by a minimum of 6 inches.
   (4) Ensure barrier is plum and level with foundation, and unroll extending Air Barrier over window and door openings.
   (5) Attach Air Barrier through sheathing board with plastic cap nails every 12" to 18" on vertical stud line with wood stud framing, and screws with washers to metal stud framing.
   (6) Prepare window and door rough openings as follows:
      a. Horizontally cut Air Barrier along bottom of header.
      b. Vertically cut Air Barrier down the center of window openings from the top of the window opening down to 2/3 of the way to the bottom of the window openings.
      c. Diagonally cut Air Barrier from the bottom of the vertical cut to the left and right corners of opening.
      d. Fold side and bottom flaps into window opening and fasten every 6 inches. Trim off excess.
      e. Prepare each rough door opening by cutting a standard “I" pattern in the Air Barrier.
         1. Horizontally cut Air Barrier along bottom of door frame header and along top of sill.
         2. Vertically cut Air Barrier down the center of door openings from the top of the door opening (header) down to the bottom of the door opening (sill).
         3. Fold side flaps inside around door openings and fasten every 6 inches. Trim off excess.
   (7) Tape all horizontal and vertical seam of Air Barrier with DuPont [tm] Tyvek® Tape.
   (8) Seal all tears and cuts in Air Barrier with DuPont [tm] Tyvek® Tape.

11. TAPING AND FLOATING:
   a. Where optional rounded edge gypsum board is used.
      (1) Fill joints with USG Durabond 90 joint compound.
      (2) Joints : filled flush and any excess compound wiped clean leaving a clear tape depression.
      (3) Joint filler : harden before tap application.

   b. Butter joint cement into joints filling them evenly and fully.

   c. Center tape and press down into cement with broad knife and leave sufficient cement under tape for proper bond.

   d. Cover with thin coat of cement to fill recess between tape and board; fill flush with board.

   e. Spot all nail heads with cement.

f. Allow to dry 24 hours. End of process for walls above ceiling height, where wall is smoke or fire stop. All joints with gaps of greater than 1/8" : pre-mudded before tape is applied.

g. Where gypsum board will be sight exposed, apply two additional coats of joint or topping cement to all joints and nail heads and allow to dry 24 hours between coats.

h. Final coat of cement : at least 9 inches on either side of joint with edges feathered.

i. Sand lightly between each coat and leave surfaces completely wiped down and dust-free.

12. CLEANING: Remove all debris and rubbish caused by this work each day and leave broom clean.

END OF SECTION

1. GENERAL:
See referenced note in SECTION: SPECIAL CONDITIONS, paragraph 1.

2. WORK INCLUDED:
Furnish labor and materials to complete acoustical ceiling system as indicated and specified. Provide equipment required to supply and install lay-in units, acoustic panel supports and exposed grid suspension system, including wire hangers, main beams, cross T's and wall angle moding. Provide supplementary framing at structure if required for proper wire support of suspend items.

3. RELATED WORK SPECIFIED ELSEWHERE:
Drywall: SECTION: GYPSUM WALL BOARD CONSTRUCTION.

4. QUALITY ASSURANCE:

a. Qualifications of Installer: Submit written description of material installer, listing name of material manufacturers, qualifications of installation personnel, and years of concurrent contracting experience.

b. Acceptable Manufacturers:

(1) Acoustical Ceiling: Standard of quality and performance: Armstrong World Industries.
Products of following manufacturers meeting quality and specification standards:
(a) USG
(b) Celotex
(c) Conwed

(2) Acoustical ceiling suspension system: standard of quality and performance: National Rolling Mills Series ML. Products of the following meeting quality and specification standards:
(a) Donn Products, Inc.
(b) Eastern Products Corp.
(c) Flange Klamp Corp.
(d) Conwed

c. Coordination:
(1) Coordinate with mechanical and electrical trades in placement of light fixtures, grilles, etc., to conform with ceiling pattern.
(2) Coordinate with metal deck installation and insure proper framing for support of wires.

5. SUBMITTALS:

a. Installers license, certification or written approval as qualified installer of approved manufacturer's products.

b. Shop Drawings:

(1) Shop drawings and submittal data : required in accordance with General and Special Conditions. Reflected ceiling plan : adequate for shop drawings with Manufacturer's data

for details. Furnish manufacturer's recommended installation details and specifications.

(2) Substitute materials must be approved in writing by Architect not less than 10 days prior to bid date. Samples : submitted with substitutions.

6. PRODUCT DELIVERY, STORAGE AND HANDLING:

a. Deliver materials in original, unopened, protective packaging, with manufacturer's labels indicating brand name, pattern, size, thickness and fire rating as applicable, legible and intact.

b. Store materials in original protective packaging to prevent soiling, physical damage or wetting.

c. Store cartons open at each end to stabilize moisture content and temperature.

d. Do not begin installation until sufficient materials to complete room are received.

7. ENVIRONMENTAL REQUIREME NTS:

a. Complete installation of dampening materials before beginning work.

b. Maintain humidity of 65% - 75% in area where acoustical materials are to be installed, 25 hours before, during, and 25 hours after installation.

c. Maintain uniform temperature in range of 55 degrees F (12 degrees C) to 70 degrees F (21 degrees C) prior to and during installation of materials.

8. MATERIALS:

a. Exposed Tee Grid Suspension System: (Non fire rated)
   (1) Series "ML" as manufactured by Nationa l Rolling Mills Co. or an approved equal:
      (a) ASTM C 635-69.
      (b) Structural classification: Intermediate Duty.
      (c) Components of system from one manufacturer.
   (2) Main, cross, and concealed members:
      (a) Web design: Double.
      (b) Cold-rolled steel, minimum thickness of .018 in., electro-zinc coated and factory painted baked white enamel.
      (c) Exposed flange: 15/16 in. width.
   (3) Edge molding, minimum .018 in. steel, channel or angle shaped, with minimum flange width of 15/16 in.
   (4) Hold down clips: type as supplied by suspension system manufacturer.
   (5) Rough suspension:
      (a) Hanger wire: Minimum 12-gauge galvanized, soft-annealed, mild steel wire.
      (b) Wire ties: 18-gauge, galvanized annealed steel wire
      (c) Hanger clips: Prefabricated metal clamps for fastening to steel joists.
      (d) Carrying channels: 16-gauge, 1-1/2 in., cold rolled steel.

b. Acoustical Units:
   (1) (Standard)
      (a) No. 704 "Minatone" as manufactured by Armstrong Co. or an approved equal. Refer to Room Finish Schedule for locations.
      (b) Pattern: Cortega.

(c) Performance:
(1) Sound transmission coefficient : 35-39 (continuous ceiling).
(2) Noise reduction coefficient :.55.
(3) Light reflectance : over .80.
(d) Size (nominal): (24" width x 24" length) and (24" width x 48" length) x 5/8" thickness (As indicated on plans).
(e) Finish: Factory applied white vinyl latex paint.
(f) Edge: straight edge.

(2) (Wet Areas)
(a) Gridstone Vinyl faced Sheetrock by Gold Bond.
(b) Pattern : Stipple
(c) Performance:
(1) Sound transmission coefficient : 35-39 (continuous ceiling).
(2) Noise reduction coefficient :.55.
(3) Light reflectance : over.80.
(d) Size (nominal) : 24" width x 24" length x 1/2" thickness.
(e) Finish: Vinyl faced.
(f) Edge: Straight edge.

9. INSTALLATION:
a. General:
(1) Lay-in acoustical materials : installed under conditions as outlined in current bulletin of Acoustical Materials Associations.
(2) Construct necessary scaffolding, adequate and safe, in accordance with local laws and ordinances. Maintain during this work and remove after completion.
(3) Install entire system in strict accordance with manufacturer's current published specifications.

b. Suspension System:
(1) Tee Splines: Space cross tee spline 24" on center in grid system.
(2) Wall Mold : not support main tees or 4' cross tees 2' and less. Cross tees may be supported by wall angle as required.
(3) Provide additional diagonal hanger wires or supplementary framing as required t o insure proper placement and alignment of grid system. Counter-splay or splay hanger wires symmetrically from joists to counteract and provide stable suspension for all anticipated loads.
(4) Provide additional hanger wires at ends of light fixtures and on closet main tee for grilles and other ceiling mounted items.

c. Acoustical Units:
(1) Field cutting where required : done in neat, inconspicuous manner. Exposed edges of cuts: sharp and unfrayed. Panels with cut edges : touched up with vinyl dope on job after cuts have been made on less than full panels. Cuts and 1/2 pieces : especially handled to preserve level installation.
(2) Install acoustical tile with clips and other accessories necessary to complete installation.
(3) Hold clips : required on each ceiling panel; panels with recessed fixtures or diffusers, and less than full panels : have 2 clips regardless, only last panel in each area may have clips omitted. If less than full panel width, use two clips and install prior to installing adjacent

full panel unit.

10. EXAMINATION AND ADJUSTMENT:
    a. Prior to turning project to Owner, examine and adjust, and water or instrument level entire ceiling installation to be certain that planes and lines are plumb, square and smooth.

11. CLEANING:
    a. Clean soiled or discolor ed unit surfaces after installation.
    b. Touch up scratches, abrasions, voids, and other defects in painted surfaces.
    c. Immediately prior to turning project over to Owner, replace marked, marred or otherwise damaged material. Any piece with marred edge of 1/2 sq. inch : considered marred.

END OF SECTION

1. GENERAL:
   See referenced note in SECTION: SPECIAL CONDITIONS, Paragraph 1.

2. DESCRIPTION OF WORK:
   a. Furnish materials, labor and equipment for resilient floor covering and related work.

   b. Related work specified elsewhere: Finishes for concrete slabs and topping substrates: SECTION: 03300 CONCRETE.

3. QUALITY ASSURANCE:
   a. Acceptable Manufacturers: Select products of one of the following manufacturers:
      Vinyl Composition Tile:
      1. Tarkett
      2. Azrock
      3. Ken Tile
      4. Armstrong

      RubberBase:
      1. Roppe
      2. Flexco

      Sheet Vinyl Flooring:
      1. GAF
      2. Armstrong
      3. Congoleum

   b. Rubber Base and Accessories : from the same manufacturer and in matching colors, unless otherwise specified.

   c. Installer qualifications:
      1. Minimum 3 years experience installing resilient floor covering material.
      2. Demonstrated quality of workmanship:
         a. Minimum number of installations: 4 in past 5 years
         b. Age of Installations:
            1. Maximum: 5 years
            2. Minimum: 1 year
            3. Approved by manufacturer of approved vinyl floor tile.

   d. Fire-rating:
      Class I Interior Floor Finish and Class B Interior Finish per NFPA Life Safety Code.

4. SUBMITTALS:
   a. Samples:
      1. Submit minimum of 3 samples of each type and color or pattern of resilient flooring and base material.
      2. Mark samples with name of Contractor, project identification, and area where materials are to be used.

   b. Certificate of Qualification:
      Within 15 days following contract award, submit certification of installer qualifications, including length of experience, list of recent installations, written approval of manufacturer.

   c. Certificates of Compliance: Submit for:

1. 1/8 inch thick Vinyl Composition Tile.
2. .096" Gauge Sheet Vinyl.

d. Maintenance Data and Instructions:
Up on completion and prior to acceptance of the work, furnish 2 copies of a list of recommended maintenance products and recommended maintenance methods and procedures.

e. Maintenance Materials:
1. Furnish additional floor covering materials for replacement and maintenance.
2. Furnish materials of each size, color, pattern, and type of material included in work.
3. Furnish materials at rate of 1 carton for each 1000 sq.ft.

5. PRODUCT DELIVERY AND STORAGE:
a. Deliver materials to project site in manufacturer's original, unopened containers with labels indicating brand names, colors and patterns, and quality designations legible and intact.

b. Do not open containers or remove markings until materials are inspected and accepted.

c. Store and protect accepted materials in accordance with manufacturer's directions and recommendations.

d. Unless otherwise directed, store materials in original containers at not less than 70 degrees F (21 degrees C) for not less than 48 hours immediately before installation.

6. ENVIRONMENTAL REQUIREMENTS:
a. Maintain temperature in space to receive tile between 72 degrees F (21 degrees C and 90 degrees F (32 degrees C) for not less than 48 hours before, during and 48 hours after installation.

b. Maintain minimum temperature of 55 degrees (13 degrees C) after flooring is installed except as specified in paragraph 6.a.

c. Slabs shall be allowed to cure at least one month prior to starting work under this Section.

7. FLOOR COVERING MATERIAL:
a. Provide tile uniform in thickness and size with edges cut accurately and square, uniform color with variations in variegated patterns kept to a minimum.

b. Vinyl Composition Floor Tile:
1. Type Flooring: Tarkett "Architectural" vinyl composition floor tile.
2. Size: 125" (1/8") gauge, 12" x 12".
3. Pattern: Classics, Structures, and Keystones.
4. Colors: as selected by Architect from all colors included in the two groups specified above. Architect may select up to two colors; one color per room.
5. Physical properties: color chips: extend through full thickness at each tile.
6. Indentation resistance: 50 psi (with floor protectors).
7. Flame spread: ASTM-E84 Flame Spread Test: 75 or less, UL 992 Flame Propagation Index: 4.0 or less. NBS Smoke Chamber test: 450 or less.

c. Luxury Vinyl Flooring:
1. Type Flooring: Armstrong LVT.
2. Thickness: 20 mil wear
3. Colors: as selected by Architect from all colors. Architect may select three colors.

4. Flame spread: ASTM-E648 Critical Radiant Flux - 0.45 watts/cm or more, Class I. ASTM E662 Smoke - 450 or less.

8. BASE MATERIALS:
   a. General:
      1. Uniform in thickness.
      2. As long lengths as practicable to suit conditions of installation, from roll goods.

   b. Rubber Wall Base:
      1. Type: Flexco Standard Rubber wall base.
      2. Size: 4" tall x 1/8" thick.
      3. Color: as selected by architect f rom all colors. Architect may select up to two colors.
      4. Configuration: cove base at all other floor finishes.
      5. Physical properties: Rubber.
      6. Flame spread rating: ASTM-E84 Flame Spread Test: 75 or less; U.L. 992 Flame Propagation Index: 4.0 or less. NBS Smoke Chamber Test: 450 or less.

   c. Factory Formed Internal and External Corners: Match base materials.

9. SPECIALTY FLOOR MATERIALS:
   a. General:
      1. Unless otherwise specified, match thickness of abutting standard flooring material.
      2. Provide uniform thickness.

   b. Reducers:
      1. Standard vinyl or rubber floor reducer.
      2. Thickness to suit abutting floor covering material by 1 inch wide.
      3. Beveled or tapered edge style.

10. APPLICATION MATERIALS:
   a. General: Provide type and brands of adhesive as recommended by manufacturer of covering material for the conditions of the Installation.

   b. Asphalt emulsion adhesive:
      1. FS-MMM-A-115A, Class II.
      2. Provide for installation of vinyl or rubber material.

   c. Brushable adhesive:
      1. Provide waterproof, brushable-type adhesives.
      2. Resinous, latex, or epoxy type for installation of vinyl-composition material.

   d. Contact Cement:
      1. Provide permanent bonding upon contact of the surfaces to be glued.
      2. Provide for installation of rubber base.

   e. Primer: Type and brand recommended by floor covering manufacturer.
   f. Crack filler: Type and brand recommended by floor covering manufacturer.
   g. Wax, cleaner, or other finishing material: as recommended by floor covering manufacturer for the particular type of flooring material.

11. INSPECTION OF SURFACES:
    a. Examine substrate for excessive moisture content and unevenness which would prevent execution and quality of resilient flooring as specified.

    b. Do not proceed with installation of resilient flooring until defects have been corrected except where correction is indicated under PREPARATION in this Section.

12. PREPARATION:
    a. Remove dirt, oil, grease or other foreign matter from surfaces to receive floor covering materials.

    b. Fill cracks less than 1/16" wide and depression less than 1/8" deep with crack filler. Follow manufacturers recommendations to correct low spots and cracks larger than the above.

    c. Prime surfaces other than wood if recommended by floor covering manufacturer.

13. APPLICATION OF ADHESIVES:
    a. Mix and apply adhesives in accordance with manufacturer's instructions.

    b. Provide safety precautions during mixing and applications as recommended by adhesive manufacturer.

    c. Apply uniformly over surfaces.
        1. Cover only that amount of area which can be covered by flooring material within the recommended working time of the adhesive.
        2. Remove any adhesive which dries or films over.
        3. Do not soil walls, bases, or adjacent areas with adhesive.
        4. Promptly remove any spillage.

    d. Apply adhesives with notched trowel or other suitable tool.

    e. Clean trowel and re-work notches as necessary to insure proper application of adhesive.

    f. Install base with contact cement, flush with top of base.

14. INSTALLATION OF TILE MATERIALS:
    a. Lay tile from center of room or space.

    b. Work toward perimeter.

    c. Do not lay tile less than 1/2 the width of a field tile except where accepted by Architect/Engineer for irregularly shaped rooms or spaces.

    d. Cut border tile neatly and accurately to fit within 1/64" (0.4mm) of abutting surfaces.

    e. Fit flooring material neatly and tightly into breaks and recesses, against bases, around pipes and penetrations, under saddles or thresholds, around permanent cabinets and equipment, under plumbing fixtures, under registers and grilles, and under movable partitions.

f. Lay tile parallel to room axis in straight courses, lay tile with grain or pattern alternating between adjacent tile.

15. INSTALLATION OF VINYL SHEET FLOORING:
    a. Cut border neatly and accurately to fit within 1/64" (0.4mm) of abutting surfaces.

    b. Fit flooring material neatly and tightly into breaks and recesses, against bases, around pipes and penetrations, under saddles or thresholds, around permanent cabinets and equipment, under plumbing fixtures, under registers and grilles, and under movable partitions.

    c. Hand roll perimeter of each sheet to assure adhesion

    d. Seam Treatment : Chemical weld seam.

    e. Prepare in accordance with manufacturer's instructions for most inconspicuous appearance.

16. INSTALLATION OF BASE:
    a. General:
        1. Install base around perimeter of room or space and at toe-spaces of casework where indicated.
        2. Unroll base material and cut into accurate lengths as desired or as required for minimum number of joints.
        3. Match edges at all seams or double cut adjoining lengths.
        4. Install with tight butt joints with no joint widths greater than 1/64".
        5. Do not install base behind permanent casework or floor-mounted fixtures.
        6. Use factory formed internal and external corners.

17. INSTALLATION OF SPECIALTY MATERIALS:
    a. General: Cut materials to lengths and sizes as required for installation.

    b. Reducers:
        1. Apply adhesives and bond securely to substrates in straight true lines.
        2. Meet visible and related features of building construction with a maximum deviation of 1/8" in 10' between.
        3. Provide where floor covering terminates exposing the edge of the covering.
        4. Center reducer under door, where floor covering terminates at a door opening.
        5. Fit end edges to door frames and abutting surfaces and other edges to adjoining materials.

    c. After cleaning, rinse well and apply 1 coat of non-slip wax or other finish as recommended by the floor covering and manufacturer and buff to a sheen. Immediately prior to the date of substantial completion, clean and apply 1 additional coat of wax, as specified above.

    d. Protect completed work from traffic and damage until acceptance by the Owner.

END OF SECTION

1. GENERAL:
Referenced note in SECTION: SPECIAL CONDITIONS, paragraph 1.

2. WORK INCLUDED:
   a. Furnish labor and materials to complete painting and finishing work as indicated and specified, including, but not limited to, complete painting, finishing of wood, concrete, plaster, stucco, unfinished metal, galvanized metal, and other surfaces throughout, exterior of building that are in conjunction with or become exposed because of work related to this project.

   b. Painting and finishing mechanical items includes, but is not limited to, all equipment, piping, fittings, covering, etc., installed in mechanical equipment room and these: painted two coats as specified. All equipment finished in prime coat in finished areas: painted by Contractor. Factory prime or coat on equipment does not constitute finish, and: require painting.

   c. Furnish tools, ladders, scaffolding, other equipment necessary for work completion.

   d. Do not paint or finish copper, bronze, chromium plate, nickel, stainless steel, aluminum or concealed piping, monel metal, etc., unless otherwise specified.

3. RELATED WORK SPECIFIED ELSEWHERE:
   a. Carpentry: SECTION: ROUGH CARPENTRY AND FINISH CARPENTRY.

   b. Shop Painting of Structural Metals, Miscellaneous Metals, etc. : DIVISION: METALS.

   c. Caulking and Sealants: SECTION: CAULKING AND SEALANTS.

   d. Job Signs: SECTION: TEMPORARY FACILITIES.

   e. Millwork: SECTION: ARCHITECTURAL WOODWORK.

   f. Drywall: SECTION: GYPSUM WALLBOARD CONSTRUCTION.

   g. Pavement Striping: SECTION: ASPHALT CONCRETE PAVING.

   h. Concrete: SECTION: CONCRETE.

   i. Concrete Block: SECTION: MASONRY WORK.

   j. Epoxy Coating: SECTION: EPOXY COATING.

   k. Identifying Devices: SECTION: IDENTIFYING DEVICES.

4. ACCEPTABLE MANUFACTURERS: (Top lines only will be used!)
   a. Sherwin-Williams (PROMAR 200 ZERO VOC) is the preferred campus paint
   Pratt & Lambert, Inc. (Red Label Only) is specified as standard of quality and performance.
   b. Approved equals: Products of specified quality and style:
   Pratt and Lambert, Inc. (Specified Materials) (Red Label Only)
   Glidden (Color Natural)
   Pittsburgh (Wall Hyde, Sun Proof)

Dan-Tex (Exterior plaster coating only)

5. QUALITY ASSURANCE:

a. Include on label of containers:

Manufacturer's name Type of paint Manufacturer's Stock number
Color Instructions for reducing, where applicable

b. Quality and Performance Standard:
   (1) Pratt and Lambert Inc., products are specified to establish the type, kind, quality and characteristics of paints and finishes required for this project. Only "highest" quality (top line) materials of specified manufacturers are acceptable.
   (2) Wherever the abbreviation "P & L" appears in the following detailed specifications, it: understood to mean Pratt & Lambert, Inc.

c. Field Quality Control:
   (1) Request review of first finished room, space, or item of each color scheme required by Architect/Engineer for color, texture, and workmanship.
   (2) Use first acceptable room, space or item as project standard for each color scheme.
   (3) For spray application, paint surface not smaller than 100 square feet as project standard.

6. MATERIALS:

a. Paint and finish materials: As specified paragraph: Materials and Coating Schedule.

b. Primers, Oils, and Thinners:
   (1) Primers: as specified by manufacturer of finish paint used and as approved by Architect.
   (2) Turpentine: Conform to FS TT-T-801.
   (3) Mineral Spirits: Conform to FS TT-T-291A, Grade1.
   (4) Linseed Oil: Conform to FS TT-L-190 (boiled).
   (5) Shellac: Conform to FS TT-S-300 4 lbs. cut.
   (6) Thinners: used only as recommended by manufacturer of paint material used and as approved by Architect.

c. Colors:
   Match existing like surfaces or finishes.

d. Mixing:
   (1) Deliver paint and enamels ready-mixed to jobsite. Job-mix and tint only when acceptable to Architect/Engineer.
   (2) Mix materials only in such rooms as may be assigned for this purpose and take all necessary precautions to prevent fire. Provide galvanized iron pans of suitable size in which all mixing pails: placed. Do not mix outside of these pans.

7. DELIVERY AND STORAGE:

a. Delivery:
   (1) Materials: delivered to project site in strong, undamaged waterproof containers with manufacturer's labels intact.
   (2) Materials in previously opened or unsealed containers are not acceptable.
   (3) No materials of any manufacturer: allowed on project site at any time during construction except those of manufacturers specified or approved by Architect.
   (4) All soiled or used rags, waste and trash must be removed from the building every night and

every precaution taken to avoid the danger of fire. Latex paints must be stored at above freezing (32degrees F. or 0 degrees C.) temperature.

b. Storage:
   (1) Immediately upon delivery to project site all painter materials: stored and locked in a watertight shed with floor well off of ground. Shed: remain locked at all times except when materials are being prepared or removed for use in project.
   (2) Use of rooms within new building is prohibited for storage.
   (3) Comply with health and fire regulations.

8. JOB CONDITIONS:
   a. Environmental Requirements:
      (1) Comply with specified requirements and manufacturer's recommendation s as to environmental conditions under which coatings and coating systems can be applied.
      (2) Do not apply finish in areas where dust is being generated.
      (3) Perform all work during favorable weather and humidity conditions: 50 degrees F. or above.

   b. Protection:
      (1) Cover or otherwise protect finished work of other trades and surfaces not being painted concurrently or not to be painted.
      (2) Protect work in progress as soon as completed.
      (3) Cover aluminum members with heavy paper and masking tape. Do not allow masking tape to touch finished surfaces.

9. INSPECTION:
   Inspect all surfaces to receive work under this section and notify applicable trades of any surface not in proper condition to be finished before proceeding with this section of work. Starting of painting or finishing work on any surface constitutes acceptance of the surface as suitable to receive painter's finish and full responsibility for quality of results obtained.

10. PREPARATION:
   a. General:
      (1) Surfaces to be painted shall be clean as well as floors and adjacent surfaces.
      (2) Mildew, efflorescence and all foreign material shall be removed from surfaces by appropriate methods.

   b. Finish Hardware:
      (1) Contractor may remove finish hardware prior to finishing doors or mask hardware with heavy paper and tape.
      (2) Tape: not be stuck to hardware, but: used to hold paper in place. Failure to do either will require hardware to be replaced or require hardware to be removed and returned to manufacturer for refinishing at Contractor's expense. If left in place, plated butts: protected as mentioned above.

   c. Back Priming: Backprime all finish trim, cabinets, and millwork against masonry and concrete.

      Backprimer:
      One coat of P & L Interior trim primer.
      One coat of P & L Vitralite enamel undercoater.

d. Natural Finished Wood: Sand smooth to remove all scratches and imperfections. Apply finish as specified under "Finishes" paragraph below.

e. Metal: Clean grease and oil from metal surfaces with turpentine or mineral spirits before applying any materials. Remove rust and scale before painting and treat with rusticide. Touch up welds, cuts, scratches and scuffed marks with metal protective primer. (Primer: match initial coat.) Fill all dents and scratches with spot putty DFL-40 by Ditzler Color Division, and sand level and smooth before painting. Before applying first coat of paint, pretreat all galvanized metal in accordance with proprietary acid bound resinous preparation. Use Pratt and Lambert No. 46 pretreatment and activator.

f. Concrete, and concrete blocks: have all loose material removed by use of fiber brushes and : dusted with burlap bags. Touch up suction spots before applying second coat.

g. Treat galvanized metal surfaces chemically with compound designed for this purpose, as per manufacturer's directions; follow with primer within 8 hours.

h. Drywall: Fill all scratches, nicks and uneven areas with spackling compound and sand flush with the surface.

11. APPLICATION:

a. General:

(1) Number of coats and quality of finish: in accordance with these specifications, requiring the use of materials which will produce first quality finish if properly applied. Application: in strict accordance with manufacturer's current published specifications, except where requirements of these specifications are in excess of manufacturer's requirements. Except as otherwise approved by Architect, first two coats of painter's finish: applied by roller or brush application. Apply under adequate illumination. Doors: tops, bottoms, and edges same as face and back.

(2) Materials: mixed in and applied directly from containers in which they are purchased except when use of other containers is approved by Architect.

(3) Allow exterior paints to dry 72 hours between coats, and interior paints to dry 24 hours between coats. Allow all enamels and varnishes to dry 2 4 hours between coats. If enamel and varnishes are tacky after 24, allow additional time until finish is dry.

(4) Exposed structural and miscellaneous steel: painted immediately after erection.

(5) All materials: spread and smoothly flowed on without run, streaks, sags, brush marks, unfinished patches or other blemishes. Sand lightly between coats where varnish or enamel are used.

b. Workmanship:

(1) Workmanship: very best; spread materials evenly; flow on smoothly without runs, sags, brush marks. Employ skilled mechanics.

(2) Touch up knots, pitch streaks, sappy spots with shellac where finish calls for interior paint or enamel. For exterior surfaces, use sealer.

(3) Do necessary puttying of nailholes, cracks, etc., after first coat with putty of color to match that of finish. Bring putty flush with adjoining surface in neat, workmanlike manner.

c. Repair and Cleaning:

(1) Work damaged as result of prosecution of this contract: repaired at this contractor's expense, or, if in opinion of Architect it cannot be repaired, it: replaced with new work by this Contractor without additional compensation beyond contract amount.
(2) Remove oily rags, waste, etc., from building every night; take precautions to avoid danger of fire.
(3) Remove spilled, splashed, or splattered paint from all surfaces.
(4) Do not mar surface finish of item being cleaned.
(5) Leave storage space clean and in condition required for equivalent spaces in project.
(6) Remove all surplus materials and equipment after work is completed. Leave entire job clean and acceptable to Architect.

12. MATERIAL AND COATING SCHEDULE:

a. General:

(1) The following specification for materials and coatings is not intended to mention every particular item which will receive painter's finish, but it is intended to establish the type and quality of finish which: provided on various materials.
(2) Provide painters finish on all items throughout project excluding only such items and materials which do not normally require painting, exceptions as noted.
(3) Paint sight exposed pipes, ducts, insulation and conduit, in or passing through mechanical room and other rooms or spaces scheduled to be painted, as well as all mechanical and electrical items (grilles, registers, escutcheon plates, access panels, convector covers, cabinets, housing, roof equipment and other equipment) which do not have a factory finish. Factory finished items: touched up by trade furnishing item; this section: apply two coat to color code as specified or match color of background wall or as required by Architect. (HVAC equipment shall be painted if visible from ground level.)

b. Exterior: (Spec. number is given for ease of reference, number and type of coats listed to be strictly followed).

(1) Aluminum : P & L Spec. No. 34.1 Prepare metal for painting as specified above.
1 coat P & L Effecto Rust Inhibiting Primer
2 coats P & L Effecto Enamel
(2) Ferrous Metal : P & L Spec. No. 41.1
1 coat P & L Effecto Rust Inhibiting Primer
2 coats P & L Effecto Enamel
(3) Galvanized Metal : P & L Spec. No.46.1
1 coat P & L Galvanized Metal Latex Primer
2 coats P & L Effecto Enamel
(4) Wood Doors & Trim : P & L Spec. No. 54.1
1 coat P & L Permalize Exterior Primer
2 coats P & L Effecto Enamel
(5) Wood Blocking : Penta Treated.
(6) Plaster: "Dan-Tex" Flex Kote special coating
1 coat Flex-Kote #109, spray-applied at the rate of 30 sq. ft. per gallon.
(7) Exposed Equipment (Factory Finished):
2 coats P & L Effecto Enamel
(8) Exposed Equipment (Not Factory Finished) : P & L Spec. No. 41.1
1 coat P & L Effecto Rust Inhibiting Primer
2 coats P & L Effecto Enamel
(9) Caulking : Not color of adjacent color:
2 coats P & L Vapex Flat Wall Finish

(10) Concrete : P &L Spec. No. 16.1
2 coats P & L Vapex House Paint
(11) Concrete: "Dan-Tex" Flex-Kote Special Coating
(12) Concrete Masonry Units: P&L Spec. No. 26.2
1 coat P & L Primafill 200
2 coats P & L Aqua Royal Latex House & Trim
(13) Brick : P&L Spec. No. 30.1
2 coats P & L Aqua Royal Latex House & Trim

c. Interior:
(1) Drywall : P & L Spec. No. 11 4.5
Texture on drywall : USG Multi-Purpose Texture Finish or approved equal applied by spray in medium-light finish and as approved by Architect from Contractor's samples.
2 coats P & L Aqua-Satin
(2) Aluminum : P & L Spec. No. 122.3
1 coat P & L Interior Trim Primer
1 coat P & L Vitralite Undercoating
1 coat P & L Vitralite Enamel Eggshell
(3) Galvanized Metal : P & L Spec. No. 122.3
1 coat P & L Interior Trim Primer
1 coat P & L Accolade
(4) Ferrous Metal : P & L Spec. No. 12 6.3
1 coat P & L Interior Trim Primer
2 coats P & L Effecto Enamel
(5) Insulated Ducts & Pipes : P & L Spec. No. 133.1
1 coat P & L Vapex Wall Primer
(6) Plaster: P & L Spec. No. 135.3
1 coat P & L Vapex Wall Primer
2 coats P & L Cellu-Tone
(7) Wood Doors, Trim, Cabinets, Shelving : P & L Spec. No. 143.1
1 coat P & L Interior Trim Primer
2 coats P & L Cellu-Tone
(8) Wood Doors, Millwork : P & L Spec. No. 146.3
1 coat P & L Paste Filler
1 coat P & L Tonetic Wood Stain
1 coat P & L Sanding Sealer
1 coat P & L 38 Clear Finish (Satin)
(9) Metal Doors an d Frames : P & L Spec No. 126.3
1 coat P & L Interior Trim Primer
2 coat P & L Effecto Enamel
(10) No painting of pipe or duct in chases.
(11) Color coding of all piping in mechanical and electrical rooms: scheduled at time of color schedule with all pipes having different colors to indicate their function. Color banding will be necessary in some instances. This is to be coordinated with mechanical and electrical contractors and is not to be bid to General Contractor.
(12) Concrete: P & L Spec. No. 106.6
2 coats P & L Accolade
(13) Concrete Masonry Units :P & L Spec. No. 118.4
1 coat P & L Prima Fill 200
2 coats P & L Aqua -Satin.
(14) Concrete Masonry Units : P & L Spec. No. 116.4

1 Coat P&L Vitrashield
1 Coat P&L Epoxy

(15) Dry Wall (Wet Areas): P & L Spec No. 116.4
1 Coat P & L Vitra-Shield wall primer.
1 Coat P & L Polgard Epoxy coating (E ggshell).

13. SUBMITTALS:

a. Conform to requirements of SECTION: SPECIAL CONDITIONS.

b. Colors:
(1) Submit manufacturer's color charts in triplicate to Architect as soon as possible after material approval.
(2) Colors : selected by Architect and : submitted to Contractor in scheduled form. Different colors may be selected in each room.
(3) First coat : white except for varnish and stains.
(4) Upon receipt of Architect's color schedule, submit two sets of all color chips s elected from manufacturer of paint used.

c. Samples:
(1) Submit 12" x 6" samples of specified natural finished wood materials with specified finish applied.
(2) Contractor : obtain Architect's approval of samples in writing before starting such work.

d. Certificates: Upon completion of project, Contractor : provide Owner and Architect a notarized certificate stating in effect that all painting and finishing materials used in project were those specified, or approved in writing by the Architect.

14. WARRANTIES:
Full one year warranty on entire installation and accessories against defects in materials and workmanship.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL AND SUPPLEMENTARY GENERAL CONDITIONS: Shall be made a part of this section. The Contractor shall read all sections of the specifications in order to thoroughly understand the nature of the entire project, the requirements for coordination among the several trades, and items in other sections which apply to the mechanical work.

1.2 SCOPE OF WORK: Furnish all labor, materials, services, equipment and appliances required for the complete furnishing and installation of the mechanical systems.

1.3 RELATED WORK SPECIFIED ELSEWHERE:

A. Finish painting unless specified otherwise in another section: Refer to Section: PAINTING.

B. Electrical Work: Refer to Section: ELECTRICAL.

1.4 PERMITS AND APPROVALS:

A. The Contractor shall obtain all permits, inspections and approvals as required by all authorities having jurisdiction. All fees and costs of any nature whatsoever incidental to these permits, inspections and approvals must be assumed and paid by the Contractor.

1.5 SHOP DRAWINGS:

A. Shop drawings of fully descriptive catalog data shall be submitted by the Contractor for all items of material and equipment furnished and installed under this contract. The Contractor shall submit to the Architect a sufficient number of copies of all such shop drawings or catalog data to provide him with as many reviewed copies as he may need; plus two (2) copies for retention by the Architect and Engineer.

B. Before submitting shop drawings to the Architect for review, the Contractor shall examine them and satisfy himself that they are correctly representative of the material or equipment to which they pertain. The Contractor shall so note on these drawings before submitting them. The Contractor's review of the shop drawings is not intended to take the place of the official review by the Architect, and shop drawings which have not been reviewed by Architect shall not be used in fabricating or installing any work.

C. The review of shop drawings or catalog data by the Architect shall not relieve the Contractor from responsibility for deviations from the plans and specifications unless he has, in writing, specifically called attention to such deviations at the time of submission and has obtained the permission of Architect thereon; nor shall it relieve him from responsibility for error of any kind in shop drawings. When the Contractor does call such deviations to the attention of the Architect, he shall state in his letter whether or not such deviations involve any extra cost. If this is not mentioned, it will be assumed that no extra cost is involved for making the change.

D. Shop drawings will be returned unchecked unless the following information is included:

Reference to all pertinent data in the specifications or on the drawings, size and characteristics of the equipment, name of the project, and a space large enough to accept an approval stamp. The data submitted shall reflect the actual equipment performance under the specified conditions and shall not be a copy of a scheduled data on the drawings.

E. Shop drawings shall be submitted on the following items, but not limited to:

1. Insulating Materials
2. Ductwork Layout
3. Turning Vanes
4. Dampers
5. Grilles and Diffusers

1.6 LOCATION OF OUTLETS:

A. The location of all pipes, outlets, appliances, etc., shown on the drawings are approximate only, and understood to be subject to such revisions as may be found necessary or desirable at the time the work is installed.

B. Generally, all outlets shall be properly centered in rooms, panels, and other finished work and shall not interfere with outlets or equipment or other trades, and shall meet the dimensioned or large scale drawings of the Architect.

C. The Contractors shall coordinate their work with the ceiling and wall finish trades, so that the finished project will be symmetrical. Outlets smaller than the pattern shall be centered on the pattern, while any outlets larger than the pattern or at the intersection of four patterns unless dimensioned otherwise on the plans.

1.7 CUTTING AND PATCHING: Refer to General Conditions. No joists, girders or columns shall be cut without first obtaining written permission from Architect.

1.8 SLEEVES: The Contractor shall provide sleeves for his service lines (including ductwork) passing through walls, floors, ceilings, roof, etc., subject to the approval of the Architect. All pipe sleeves installed in the vertical position shall be constructed of 26-gage galvanized iron. All pipe sleeves in the horizontal position shall be constructed of standard weight steel pipe or extra heavy cast iron pipe. Oversized sleeves shall be provided for insulated lines and ductwork to pass full thickness of insulation. All sleeves shall be installed flush with finished surface.

1.9 DISCREPANCIES AND INCONSISTENCIES: Refer to General Conditions. Wherever there are discrepancies between drawings or between drawings and specifications or conflict within specifications, the Contractor shall base his bid upon the better quality or greater quantity called for and it shall be so furnished and installed unless otherwise ordered.

1.10 WARRANTY: The Contractor shall guarantee all labor and materials furnished by him for a period of one year from the date of acceptance of the completed work. Certain work shall be guaranteed for a longer period when so specified. The warranty shall cover the repair or replacement without additional cost to the Owner of any and all defects (including lost refrigerant) which, in the opinion of the Architect, are a result of defective material or faulty workmanship.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 15010

PART 1 - GENERAL

1.1 CLEANING UP:

A. Each Contractor shall at all times keep the premises free from accumulations of waste materials or rubbish caused by his employees or work, and at the completion of the work shall remove all his rubbish from and about the building and all his tools, scaffolding and surplus materials and shall leave the work "broom clean" or its equivalent unless more exactly specified.

1.2 BALANCING:

A. Testing, adjusting, and balancing (TAB) of the air conditioning system and related ancillary equipment will be provided by the Mechanical Contractor.

PART 2 – PRODUCTS – Not Used

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENT OF TESTS: The following tests shall be made in accordance with all laws and governing authorities.

3.2 DUCTWORK:

A. Ductwork shall be tested and balanced per SMACNA recommendations.

(1) Maximum allowable leakage in low pressure systems is 5%.

(2) Ductwork with sealed joints shall be pressure tested and proven leak free at the maximum pressure the system will develop at no flow conditions.

END OF SECTION 15020

PART 1 - GENERAL

1.1 SCOPE: This section of the specifications includes supply and return, ducts, risers, branches, etc., grilles, dampers, etc., as necessary to make the modification to the system as shown on the drawings.

PART 2- PRODUCTS

2.1 GRILLES, REGISTERS AND DIFFUSERS:

A. All grilles, registers and ceiling diffusers shall be furnished and installed where indicated on the drawings. Supply units shall be designed to provide the throw and spread required with no apparent drafts or excessive air movements within the ventilated or air conditioned spaces. Any air distribution accessories required to effect these conditions shall be furnished and installed as part of the supply unit by the Contractor.

B. The noise spectrum of the supply units shall be NC-35 as defined in the latest issue of ASHRAE Guide. Units causing excessive air movement, drafts, or objectionable noise shall be replaced at no cost to the Owner.

C. The manufacturer's type numbers are listed to establish a type, appearance and construction for grilles and air outlets. Units as manufactured by other approved manufacturers may be submitted for approval. The Contractor is cautioned that each of these manufacturers make approved equipment, but the equipment submitted must be similar and equal to the specific number listed below in performance, air pattern, materials, finish and appearance.

D. Registers: Where registers are noted or required, they shall be grilles of the proper type as hereinafter scheduled with the addition of factory installed key operated opposed blade dampers.

E. Each supply and return duct terminal shall be provided with a grille, register or diffuser as scheduled on the drawings. Units shall be Titus, Krueger, J & J, or Price.

(1) Flanges of all diffusers, registers and grilles shall be gasketed with foam rubber gaskets to prevent leaking and smudging.

(2) All diffusers, registers and grilles shall be furnished with off-white baked enamel.

2.2 DUCTWORK MATERIALS:

A. General: Non-combustible or conforming to requirements for Class 1 air duct materials, or UL 181.

B. Steel Ducts: ASTM A525 or ASTM A527 galvanized steel sheet, lock-forming quality, having zinc coating of 1.25 oz per sq. ft. for each side in conformance with ASTM A90.

C. Sealant: Non-hardening, water resistant, fire resistive, compatible with mating materials; liquid used alone or with tape, or heavy mastic.

D. Hanger Rod: Steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

2.3 DUCTWORK GENERAL:

A. All supply and return ducts shall be erected from galvanized steel in the general locations shown on the drawings, but must conform to all structural and finish conditions of the building. Before fabrication of any ductwork, the Sub-Contractor shall check the physical changes in cross sections, offsets, etc., whether they are specifically indicated or not.

B. All holes in ducts for damper rods and other necessary devices shall be either drilled or machine punched (not pin punched), and shall not be any larger than necessary. All duct openings shall be provided with sheet metal caps if the openings are to be left unconnected for any length of time. All panels of ducts 12" and larger shall be cross broken. Where possible, sheet metal screws shall not be used in duct construction unless the head (not the point) of the screw is in the air stream.

C. Each duct system shall be constructed for the specific duct pressure classifications shown on the Contract Drawings for the project. Where no specific duct pressure class designations are provided by the designer the 1" water gage pressure class is the basis of compliance with these standards, regardless of velocity in the duct.

D. Use crimp joints with or without bead for joining round duct sizes 8 inch and smaller with crimp in direction of air flow.

E. Low pressure flexible ductwork shall be Thermaflex or approved equal Type "M-KE" for low pressure and shall comply with UL181 Class 1 and shall meet NFPA 90A-90B ratings.

F. Ductwork Sealing: All ductwork, plenums, etc., shall be sealed according to SMACNA Table 1-2, seal Class ‘B’.

2.4 LOW PRESSURE ROUND DUCTWORK:

A. Low pressure (less than 3” s.p.) round ducts shall be constructed with a lock type or welded longitudinal seam. Gage for ducts shall be as follows:

Up to 14” in diameter	No. 26 gage
15” to 26”	24
27” to 36”	22
37” to 50”	20

2.5 DUCT SUPPORTS:

A. All horizontal ducts up to and including 40" in their greatest dimension shall be supported by means of No. 18-gage band iron hangers attached to the ducts by means of screws, rivets or clamps, and fastened above to inserts, toggle bolts, beams, clamps or other approved means. Each section of duct shall have at least one pair of supports. Clamps shall be used to fasten hangers to reinforcing on sealed ducts.

2.6 DAMPERS:

A. Furnish and install dampers where shown on drawings and wherever possible, necessary for complete control of the air flow, including all supply and return branches, "divisions" in main supply and return ducts, each individual air supply outlet and fresh air ducts. Where

access to dampers through a suspended ceiling is necessary, the Contractor shall be responsible for the proper location of the access doors.

B. Volume and Control Dampers - Size all dampers for linear flow output. Damper frames shall not be less than 13-gage galvanized steel formed for extra strength with mounting holes for flange and enclosed duct mounting. All damper blades shall be not less than 16-gage galvanized steel roll formed for high velocity performance. Blades on all dampers shall not be over 8" wide. Blade bearings shall be nylon with 1/2" zinc-plated steel shafts. Shafts and blades shall be bolted through to prevent misalignment. All blade linkage hardware shall have corrosion resistant finish and be readily accessible for maintenance after installation. Blade side edges shall seal-off against spring stainless steel seals to obtain minimum leakage. Teflon coated thrust bearings shall be provided at each end of every blade to minimize torque requirements and insure smooth operation. Submit leakage and flow characteristics data for all control dampers. All blade linkage hardware shall be constructed of corrosion-resistant zinc-plated steel and brass. Leakage rating shall be less than 1/2% of flow rate at 2000 FPM at 4" W.G. pressure difference across damper. All dampers shall be parallel type – no opposed blade dampers allowed.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.

B. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

C. All sheet metal ductwork shall be securely hung from the building construction. All ducts shall be hung adjacent to the seam in the duct and shall be secured in a suitable manner to both the duct and the building construction. Sloppy and unworkmanlike installation will not be acceptable.

D. Connect diffusers to low pressure ducts with 5 feet maximum length of flexible duct. Hold in place with strap or clamp.

E. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

F. Install concealed remote damper actuators on all dampers located above gypsum board, plaster, or otherwise inaccessible ceilings.

END OF SECTION 15120

PART 1 - GENERAL

1.1 SCOPE:

A. The Contractor shall furnish and install insulation as hereinafter specified. All work shall be done by experienced applicators and shall be furnished in a neat and workmanlike manner.

B. No insulation shall be applied until the duct systems to which it is applied have been completely tested and approved for the application of insulation materials.

C. All surfaces to be insulated shall be thoroughly cleaned before any insulation is applied. All surfaces shall be dry when insulation is applied.

D. No insulation that contains asbestos is allowed.

E. Acceptable manufacturers shall be Owens-Corning, Armstrong, Knauf, or Schuller.

PART 2 - PRODUCTS

2.1 CONCEALED ROUND SUPPLY AND RETURN AIR DUCTWORK: All return air ductwork shall be externally insulated with 2" thick Owens-Corning flexible fiberglass commercial grade type 150 with .0020 aluminum foil exterior. Joints shall be lapped 6" in both directions and 6" over the lined area and sealed with approved mastic applied over each joint and secured in place. Insulation shall be installed in a vapor tight manner and may be fastened with the use of staples or other fastening material provided the fasteners are covered with mastic.

PART 3 - EXECUTION

3.1 DUCTWORK: Insulation (vapor barrier side out) shall be secured to klips on approximately 12" centers along edges of sections of insulation and various other points as may be required to hold the insulation firmly against the duct. After insulation is in place, all joints, seams and fasteners shall be pointed up smoothly with fiberglass vapor barrier adhesive, reinforced with glassfab membrane fabric.

END OF SECTION 15250

PART 1 - GENERAL

1.1 GUARANTEE: The Contractor shall guarantee all work done under this specification to be free from defects in material and workmanship for a period of one year from date of acceptance of the completed work, and shall repair or replace any defective materials without cost to the Owner.

1.2 INTENT: It is the intention under this specification that the Contractor shall provide a complete installation except as hereinbefore specifically excepted. All accessory construction and apparatus necessary or advantageous in the operation and testing of the work shall be included. The omission of the specific reference to any part of the work necessary for such completion and/or installation shall not be interpreted as relieving the Contractor from furnishing and installing such parts.

1.3 RECORDS FOR OWNER:

A. Each contractor shall accumulate during the job progress the following data in triplicate, prepared in a neat brochure or packet folder, and turn over to the Architect for checking and subsequent delivery to the Owner:

(1) All warranties, guarantees and manufacturer's directions on equipment and materials covered by the Contract.

(2) Copies of approved shop drawings:

(3) Framed set of operating instructions for heating and cooling and other mechanical systems. Operating instructions shall also include recommended maintenance and seasonal change over procedures.

(4) Any and all other data and/or drawings required during construction.

(5) Repair parts list of all major items and equipment including name, address and telephone number of local supplier or agent.

(6) Valve tag charts and diagrams as hereinbefore specified.

B. Each contractor shall obtain at his own expense a complete set of reproducibles on which he shall keep an accurate record of the installation of all materials and systems covered by his contractual agreement. The record shall indicate the location of all equipment and the routing of all systems. All piping buried in concrete slabs, walls, and below grade shall be located by dimension unless a surface mounted device in each space indicates the exact location.

C. All of the above data, with the exception of the record drawings and valve charts, shall be delivered to the Architect before the project completion.

1.4 ROUGHING-IN AND FINAL CONNECTIONS:

A. The Contractor shall have the responsibility of rough-in for and assembly of various equipment to make final connection to equipment furnished by the Owner, or under other

sections of these specifications.

B. Roughing-in and assembling of this equipment shall be determined from the manufacturer's shop drawings or as directed and in no case shall the location be scaled from the Architectural or Mechanical drawings.

C. The Contractor shall be aware that various equipment, valves, strainers, unions, etc., shown on the plans furnished by others shall be coordinated and assembled before installation under this contract.

END OF SECTION 15801

PART 1 - GENERAL

1.1 SPECIAL NOTICE

A. The general conditions of the contract and applicable requirements of the general condition govern this Division.

B. Read all relevant documents, become familiar with the job, the scope of work, type of general construction, architectural, structural, mechanical and electrical drawings and the specifications. Become familiarized with the purpose for which these documents have been prepared and shall become cognizant of all the details involved. Coordinate work with that of others to the end that unnecessary delays be avoided.

1.2 TERMS

A. The term "Contractor" used in this division of the contract documents shall mean the contractor whose work is covered by this section.

B. The term "Architect" used in this division of the contract documents shall mean the Architect of Record.

C. The term "Engineer" used in this division of the contract documents shall mean the consulting electrical engineer.

D. The term "furnish" used in this division of the contract documents shall mean to supply the work described.

E. The term "install" used in this division of the contract documents means to fix in position the work described.

F. The term "provide" used in this division of the contract documents means to furnish the material described for use by others.

1.3 SCOPE OF WORK

A. The work under this section to the specifications shall include all labor and materials noted, required or necessary for the complete electrical installation described herein and/or shown on the drawings. All work shall be completed to the entire satisfaction of the Architect and Engineer.

B. This work includes, but is not limited to the following:

1. Electric and signal services hereinafter specified and/or shown on the drawings including fees, .

2. Complete systems of distribution and utilization for light and power.

3. Empty conduit systems for telephones and other miscellaneous communications systems.

4. Lighting fixtures and lamps.

1.4 CODES, STANDARDS AND PERMITS

A. Obtain all permits, inspections and approvals as required by regulatory authorities. Pay all fees and costs of any nature whatsoever incidental to these permits, inspections and approvals. Pay any pro-rata costs for utilities serving this property.

B. All materials and workmanship shall comply with all applicable codes, specifications, ordinances and utility company regulations.

C. In case of difference between applicable codes, specifications, utility company regulations and the Contract Documents, the most stringent shall govern. Promptly notify the Architect in writing of any such difference. Should any work be performed that does not comply with the requirements of the applicable codes and utility company regulations, the contractor shall bear all costs arising in correcting these deficiencies.

D. In addition to local, county, and state ordinances and the utility company regulations, the following industry standards and codes shall apply as applicable except where the requirements of this specification are more stringent than the following standards, they shall take precedence

1. ASTM - American Society of Testing Material

2. IEEE - Institute of Electrical and Electronics Engineer

3. IES - Illuminating Engineering Society

4. NEC - National Electric Code

5. NEMA - National Electrical Manufacturers' Association

6. NFPA - National Fire Protection Association

7. UL - Underwriters' Laboratories

1.5 SPECIAL CONSIDERATION

A. The manufacturer's published directions shall be followed in the delivery, storage, protection, installation, piping, and wiring of all equipment and material. Promptly notify the Architect in writing of any conflict between the requirements of the Contract Documents and the manufacturers' directions and shall obtain the Architect's instructions before proceeding with the work. Should any work be performed that does not comply with the manufacturers' directions or such instructions from the Architect, the contractor shall bear all costs arising in connection with the deficiencies.

B. Comply with all local customs as to which particular trade shall install any part or parts of any work or equipment specified under the heading of electrical work and

plan and execute work so as not to interfere with other contractors in the building.

1.6 GUARANTEE

A. Furnish the name, address and telephone number of those persons responsible for service on systems and equipment covered by the "Guarantee".

B. All work shall be guaranteed for a period of one year from date of final completion.

C. Upon notice of any electrical malfunction, remedy the malfunction including all materials, equipment, and labor at no cost to the Owner.

D. In addition to the guarantee herein specified, each piece of electrical equipment shall be provided with the standard manufacturer's warranties for the number of years as specifically noted.

1.7 RESPONSIBILITY OF THE CONTRACTOR

A. Each contractor shall be responsible for all work of every description in connection with his contract. He shall specifically and distinctly assume, and does so assume, all risk for damage or injury from whatever cause to property or person used or employed on or in connection with his work and of all damage or injury to any persons or property wherever located, resulting from any action of operation under the contract or in connection with the work, and undertake the promise to defend the Owner against all claims on account of any such damage or injury.

B. Each contractor will be held responsible for the execution of a satisfactory and complete piece of work, in accordance with the true intent of the drawings and specifications and all bulletins and addenda which may be issued during the time of bidding. He shall provide, without extra charge, all incidental items required as a part of his work, even though not particularly specified or indicated, and if he has good reason for objecting to the use of any materials, appliance or method of construction shown or specified, he shall make report of such objections to the Engineer and obtain proper adjustment before the Contract is made, and shall proceed with the work, only with the understanding that a satisfactory job is required.

C. Each contractor shall be responsible for compliance with all national, state, local and county codes, standards, ordinances and regulations.

1.8 SUBMITTAL DATA

A. Within thirty (30) days after award of the Contract, make a submittal of all proposed equipment to be used on the job.

B. Submit through regular channels submittal data as specified in the Architectural Section of the specifications. Upon receipt of this data, the Engineer will check, stamp and sign it, retain one copy, and return the remainder for distribution.

C. Before submission of the submittal data, check each piece of apparatus, equipment and accessory to insure compliance with the requirements of the plans

and specifications, and clearly mark each submittal with his signature to indicate that they are in full compliance. Any submittals received without the contractor's signature may be returned without being checked by the Engineer's office.

D. Point out all deviations between the plans and specifications and materials submitted.

E. Each submittal shall be bound in an individual folder properly indexed and marked to indicate job, contractor, Architect, and Engineer. Data submitted shall show proposed equipment only and shall not be catalogues showing a manufacturer's complete line. Sufficient data shall be included to prove compliance with the specifications as far as use, capacity, efficiencies, physical size, quality of materials, and all other pertinent specified particulars. Data shall include manufacturer's name for each item of equipment being submitted.

1.9 SHOP DRAWINGS

A. Submit shop drawings whenever equipment proposed varies in physical size and arrangement from that shown on the drawings thus causing rearrangement of equipment space where tight spaces require extreme coordination between ductwork, piping and other equipment where called for elsewhere in these specifications, and where specifically requested by the Engineer. Shop drawings shall be made at no additional charge to the Owner or Engineer.

B. All required shop drawings as hereinafter specified, shall be prepared at a scale of not less than 1/4 inch equals one foot by the Contractor. He shall submit prints as hereinbefore described under "Submittal Data."

C. Composite shop drawings shall be prepared as specified. Aid in the coordination of this work so that all systems will fit within spaces allotted. Shop drawings shall be prepared to show physical arrangement and dimensions of all switchboards, distribution panelboards, transformers and similar major equipment and routing of all service and main distribution feeders. Shop drawings for switchboards, distribution panelboard and other motor control centers shall include a one-line diagram indicating bussing arrangement. Shop drawings shall indicate manufacturer's name for each item of equipment being submitted.

1.10 RECORD DRAWINGS

A. Before submission of the submittal data, check each piece of apparatus, equipment and accessory to insure compliance with the requirements of the plans and specifications, and clearly mark each submittal with his signature to indicate that they are in full compliance. Any submittals received without the contractor's signature may be returned without being checked by the Engineer's office.

B. In addition to the above, accumulate during the job progress the following data in duplicate prepared in a neat brochure or packet folder.

1. All warranties and guarantees and manufacturer's directions on equipment and material covered by the Contractor.

2. Copies of reviewed shop drawings.

3. Repair parts list of all major items and equipment including name, address and telephone number of local supplier or agent.

4. Diagrams hereinbefore specified.

1.11 SUPERVISION

A. Before submission of the submittal data, check each piece of apparatus, equipment and accessory to insure compliance with the requirements of the plans and specifications, and clearly mark each submittal with his signature to indicate that they are in full compliance. Any submittals received without the contractor's signature may be returned without being checked by the Engineer's office.

1.12 DRAWINGS AND SPECIFICATIONS

A. The interrelation of the specifications, drawings and schedules shall be as hereinbefore described in the Architectural Sections of the specifications.

B. When the drawings do not give exact details as to the elevations of pipe, conduit and ducts, the contractors shall physically arrange the systems to fit in the space available at the elevations intended with the proper grades for the functioning of the systems involved. Piping, exposed conduit and the duct system are generally intended to be installed true and square to the building construction and located as high as possible against the structure in a neat and workmanlike manner. Work shall be concealed in all finished areas.

C. Different electrical outlets, devices, etc. are indicated by symbols scheduled on the drawings. Approximate locations are shown; however, the Architect or Engineer reserves the right to make reasonable changes in locations without additional cost.

D. Lines indicating branch circuits do not show exact routing but indicate the arrangement and control of circuits. Conceal raceways (unless noted otherwise) and run in most direct manner between cabinets, outlets, etc.

1.13 EXAMINATION OF PREMISES

A. Before submitting proposals for his work, each bidder shall be held to have examined the premises and satisfied himself as to the existing conditions under which he will be obliged to operate, or that will in any manner affect the work under this Contract. No allowance shall be made subsequently in this connection in behalf of the Contractor for any error or negligence on his part

1.14 COST BREAKDOWN

A. At the request of the Architect or Engineer furnish, on an approved form, a breakdown of the cost of labor and materials for stipulated items. The total of these breakdowns shall equal the contract amount. This data must be received by the Architect and/or Engineer prior to the approval of the first estimate for payment on the contract and shall be used to evaluate monthly cost estimates.

1.15 MANUFACTURER'S DIRECTIONS

A. The manufacturer's published directions shall be followed in the delivery, storage, protection, installation, piping and wiring of all equipment and material. Promptly notify the Engineer in writing of any conflict between the requirements of the Contract Documents and the manufacturer's directions, and obtain the Engineer's instructions before proceeding with the work. Should any work be performed before receiving such instructions from the Engineer, the contractor shall bear all costs arising in connection with the deficiencies.

PART 2 - PRODUCTS

2.1 MATERIALS AND MANUFACTURERS

A. Materials furnished shall be new of best quality and grade of standard manufacturer, shall conform to the National Board of Fire Underwriters' requirements, and shall bear the Underwriters' Laboratories seal of approval.

B. Indication on drawings and/or naming in specifications of model numbers of a particular manufacturer shall not be construed as excluding from consideration similar and equivalent items produced by other manufacturers, subject to following provisions

1. Where a manufacturer's name appears in the specifications, it is not to be construed as to mean that equipment by the named manufacturer does not have to fully meet the requirements detailed in the specifications. All similar equipment provided for the project by any one contractor shall be of the same manufacturer whether furnished under the original contract or under a change order, unless specifically specified to the contrary

2. Each item of equipment shall fit plan and space allowed and surrounding conditions and fulfill completely the function for which it is intended as well as item named on drawings or in specifications.

3. Full and complete catalog illustrations, specifications, and descriptive data defining in detail each item shall be submitted to Architect for approval before order in placed for such items.

2.2 SCAFFOLDING

A. Furnish all scaffolding as required for the installation of his work. Either arrange for servicing in connection with any rigging and hoisting required or provide equipment to hoist apparatus to be installed into place. Any equipment too large to permit passage through doorways and access ways is brought to the job and set in place before the spaces are enclosed.

2.3 ACCESS DOORS

A. Furnish and turn over to the General Contractor for installation access doors as required to operate and service all equipment and valves furnished and installed by him. Access doors shall be of the sizes indicated on the drawings or required for proper access to equipment with mounting straps, concealed hinges, screwdriver locks and so designed that they will open 180°. The doors shall be constructed from 16 gauge steel with door and frame finished in prime coat finish.

B. Approved Manufacturers: Josam, Milcor, Zurn, and Wade.

2.4 SERIES RATING

A. The entire electrical distribution system shall be series rated for 100KA symmetrical incoming fault current unless otherwise noted on the plans.

PART 3 - EXECUTION

3.1 CUTTING AND PATCHING

A. Notify the General Contrator sufficiently ahead of the construction of any floors, walls, ceiling, roofs, etc., of the openings that will be required for his work. He shall also see that any and all sleeves that are required for his work are set at proper times so as not to hold up the progress of the job. Any cutting and patching required to be done because of lack of proper coordination shall be done by the General Contractor at the expense of the contractors involved. Do not request the General Contractor to cut any structural members without first having received written permission from the Architect. Cutting of round openings which can be done by the use of a rotary drill may be done by the contractor requiring same.

3.2 COORDINATION WITH OTHER TRADES

A. Check with the General Contractor and other contractors, either under his control or those responsible solely to the Owner for any work being performed under this specification to determine whether there will be any interference with the electrical work. If this Contractor fails to check with the other contractors and this work is later found to interfere with their work, then he shall make necessary changes without additional cost or delay to the Owner to eliminate such interferences.

B. Where lighting fixtures are shown to conflict with locations of structural members, mechanical or other equipment, provide adequate support and wiring to clear same.

3.3 FINAL OBSERVATIONS

A. The purpose of the final observation is to determine whether the contractor has completed the work in a proper and workman-like manner, that he has apparently installed the work in accordance with the intent of the drawings and specifications, and that in the Architect and Engineer's opinion the work is satisfactory for the Owner to accept.

B. It shall be the duty of each contractor to personally make a special inspection trip assuring himself that the work on the subject is ready before calling upon the Architect and Engineer to make a final site observation.

C. Each contractor shall have all necessary bonds, guarantees, receipts, affidavits, etc. called for in the various articles of this specification, prepared and signed in advance, and together with a letter or transmittal, listing each paper included, shall deliver the same to the Architect at or before the time of said final

inspection. The contractor is cautioned to check over each bond, receipt, etc. before preparing same for submission to see that the terms check with the requirements of the specifications.

3.4 CLEANING

A. Thoroughly clean all fixtures, switches, panelboards and other devices and equipment furnished and set in place. All surfaces shall be properly polished and shall be free of paint and other dirt and debris.

B. Touch up or refinish all equipment furnished with factory applied finishes which have been damaged during the construction of the work. Properly protect the fronts of all panelboards, switchboards and other similar equipment to prevent marring and other defacing.

3.5 OPERATION PRIOR TO COMPLETION

A. When each and every piece of electrical and mechanical equipment is ready to operate, if it is to the advantage of the Owner or the project construction to operate this equipment, the Mechanical and Electrical Contractors under this section of the work shall allow their equipment to be operated without obligating the Owner for acceptance.

B. The Owner or General Contractor shall furnish the necessary operating personnel to supervise the overall operation of the machinery, but it shall remain the Contractor's responsibility until final acceptance by the Engineer for the Owner.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Grounding and bonding components.

1.2 REFERENCES

A. NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association; 1999.

B. NFPA 70 - National Electrical Code; National Fire Protection Association; 2002.

1.3 PERFORMANCE REQUIREMENTS

A. Grounding System Resistance: 5 ohms.

1.4 SUBMITTALS

A. See Section 16010 for submittal procedures.

1.5 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.1 CONNECTORS AND ACCESSORIES

A. Wire: Stranded copper.

B. Grounding Electrode Conductor: Size to meet NFPA 70 requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing conditions prior to beginning work.

B. Verify that final backfill and compaction has been completed before driving rod electrodes.

3.2 INSTALLATION

A. Provide bonding to meet requirements described in Quality Assurance.

B. Provide isolated grounding conductor for circuits supplying personal computers.

C. All conduit work, motors, starters, and electrical equipment wired and connected by this contractor shall be effectively and permanently grounded in full accordance with Article 250, N.E.C.

D. Carefully and securely ground all fluorescent fixture bodies to the conduit system.

E. Where motors and other similar devices are connected using rubber cords, the device shall be grounded using a green ground wire properly connected to both the device and the distribution system ground.

3.03 FIELD QUALITY CONTROL

A. Perform inspections and tests listed in NEMA STD ATS, Section 7.13.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Conduit and equipment supports.

B. Anchors and fasteners.

1.02 REFERENCES

A. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association.

B. NFPA 70 - National Electrical Code; National Fire Protection Association.

1.03 SUBMITTALS

A. See Section 16010 for submittal procedures.

B. Product Data: Provide manufacturer’s catalog data for fastening systems.

C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Thomas & Betts Corporation:

B. THREADCO.

C. Threaded Rod Company.

D. B-Line

2.02 MATERIALS

A. Hangers, Supports, Anchors, and Fasteners - General: Corrosion-resistant materials of size and type adequate to carry the loads of equipment and conduit, including weight of wire in conduit.

B. Supports: Fabricated of structural steel or formed steel members; galvanized.

C. Anchors and Fasteners:
   1. Obtain permission from Architect before using powder-actuated anchors.

   2. Concrete Structural Elements: Use precast inserts, expansion anchors, powder-actuated anchors, or preset inserts.

3. Steel Structural Elements: Use beam clamps, steel spring clips, steel ramset fasteners, or welded fasteners.

4. Concrete Surfaces: Use self-drilling anchors or expansion anchors.

5. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts or hollow wall fasteners.

6. Solid Masonry Walls: Use expansion anchors or preset inserts.

7. Sheet Metal: Use sheet metal screws.

8. Wood Elements: Use wood screws.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install hangers and supports as required to adequately and securely support electrical system components, in a neat and workmanlike manner, as specified in NECA 1.

1. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.

2. Obtain permission from Architect before drilling or cutting structural members.

B. Rigidly weld support members or use hexagon-head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.

C. Install surface-mounted cabinets and panelboards with minimum of four anchors.

D. In wet and damp locations use steel channel supports to stand cabinets and panelboards 1 inch (25 mm) off wall.

E. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

F. All horizontal runs of conduit shall be suspended from the structural members above by means of approved hangers.

G. Supports and hangers shall be installed to permit free expansion and contraction in the conduit system as necessary.

H. No conduit shall be self-supporting nor shall it be supported from the equipment connections.

I. Conduits exposed in mechanical spaces and/or equipment rooms and/or buildings without ceilings shall be run in groups, shall be supported on 'U' channel, or galvanized steel angles, rod hung, and neatly ganged together.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nameplates and labels.

B. Wire and cable markers.

C. Conduit markers.

D. Field-painted identification of conduit.

E. Motor rotation tags.

F. Junction box, pull box marking.

1.02 REFERENCES

A. NFPA 70 - National Electrical Code; National Fire Protection Association.

1.03 SUBMITTALS

A. See Section 16010 for submittals procedures.

B. Product Data: Provide catalog data for nameplates, labels, and markers.

C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Quality Assurance. Include instructions for storage, handling, protection, examination, preparation and installation of product.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Brady Corporation.

B. Seton Identification Products: www.seton.com.

C. HellermannTyton.

2.02 NAMEPLATES AND LABELS

A. Nameplates: Engraved three-layer laminated plastic, black letters on white background.

B. Locations:
   1. Each electrical distribution equipment.
   2. Main and branch interrrupting devices.
   3. Switches & Starters.
   4. Transformers.
   5. Communication cabinets.

C. Letter Size:
   1. Use 1/8 inch (3 mm) letters for identifying individual equipment, overcurrent devices and loads.
   2. Use 1/4 inch (6 mm) letters for identifying grouped equipment, panelboards and loads.

D. Provide a series rating label on each panel per NEC 110.22

E. Provide a wire color label on each panel raceway or junction box per NEC 215.12.

2.03 WIRE MARKERS

A. Locations: Each conductor at panelboard gutters, pull boxes, outlet boxes, and junction boxes each load connection.

B. Legend:
   1. Power and Lighting Circuits: Branch circuit or feeder number indicated on drawings.
   2. Control Circuits: Control wire number indicated on schematic and interconnection diagrams on drawings.

2.04 UNDERGROUND WARNING TAPE

A. Description: 4 inch (100 mm) wide plastic tape, colored red with suitable warning legend describing buried electrical lines.

2.05 JUNCTION BOXES AND PULL BOXES

A. Identification shall be with a black permanent marking pen on the top of 4”x4” junction box covers or on the back of an outlet box cover plate identifying the branch circuits and systems within the conduit. Pull boxes shall be provided with a nameplate stating voltage and system served.

2.06 WIRING DEVICE WALL PLATES

A. On the back side of wiring devices wall plates identify with a black permanent marking pen the panelboard and branch circuit number the device is served from.

2.07 ROTATION TAGS

A. Rotation tags shall be brass or aluminum securely attached to equipment.

PART 3 EXECUTION

3.01 PREPARATION

A. Degrease and clean surfaces to receive nameplates and labels.

3.02 INSTALLATION

A. Install nameplates and labels parallel to equipment lines.

B. Secure nameplates to equipment front using screws.

C. Secure nameplates to inside surface of door on panelboard that is recessed in finished locations.

D. Identify underground conduits using underground warning tape. Install one tape per trench at 3 inches (75 mm) below finished grade.

3.03 PANELBOARD DIRECTORIES

A. Complete all identification cards for switches, starters, and other devices in all lighting, appliance and distribution panelboards, switches, motor control centers and similar pieces of equipment, on a typewriter in a neat manner and insert the card in the card holder behind a piece of clear plastic.

B. Where the card size is insufficient for the proper identification of all circuits, the index shall be made on a large sheet of paper of proper proportion, and then photo-reduced to fit the card holder.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wire and cable for 600 volts and less.

B. Wiring connectors and connections.

1.02 RELATED SECTIONS

A. Section 16075 - Electrical Identification.

1.03 REFERENCES

A. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association.

B. NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association.

C. NFPA 70 - National Electrical Code; National Fire Protection Association.

1.04 SUBMITTALS

A. See Section 16010 for submittal procedures.

B. Product Data: Provide for conductor type.

C. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency.

1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

C. Products: Furnish products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 WIRING REQUIREMENTS

A. Use solid conductor for circuits 10 AWG and smaller.

B. Use stranded conductors for circuits 8 AWG and larger.

C. Use conductor not smaller than 12 AWG for power and lighting circuits.

D. Use conductor not smaller than 16 AWG for control circuits.

E. Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet (25 m).

F. Use 10 AWG conductors for 20 ampere, 277 volt branch circuits longer than 200 feet (160 m).

2.02 WIRE MANUFACTURERS

A. Triangle.

B. Rome.

2.03 BUILDING WIRE

A. Description: Single conductor insulated wire.

B. Conductor: Copper for branch circuits, copper or aluminum alloy compact stranded (where allowed by codes and ordinances) for Service, Panelboard, and Transformer feeders.

C. Insulation Voltage Rating: 600 volts.

D. Insulation: NFPA 70, Type THHN/THWN.

3.01 EXAMINATION

A. Verify that interior of building has been protected from weather.

B. Verify that mechanical work likely to damage wire and cable has been completed.

C. Verify that raceway installation is complete and supported.

D. Verify that field measurements are as indicated.

3.02 PREPARATION

A. Completely and thoroughly swab raceway before installing wire.

3.03 INSTALLATION

A. Route wire and cable as required to meet project conditions.
   1. Wire and cable routing indicated is approximate unless dimensioned.

   2. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.

   3. Include wire and cable of lengths required to install connected devices within 10 ft (3000 mm) of location shown.

   4. Installation of conductors shall be made in a neat and workman like manner to meet code requirements and shall be run continuous without weld, splice or joint between boxes.

   5. Do not install wires in conduit unless the entire system of conduit and outlet boxes is permanently in place.

   6. All conductors shall be pulled using a UL approved wire lubricant as required.

B. Install wire and cable in accordance with the NECA "Standard of Installation."

C. All wiring shall be installed in raceways unless noted otherwise.

D. Pull all conductors into raceway at same time.

E. Use suitable wire pulling lubricant for building wire 4 AWG and larger.

F. Neatly train and lace wiring inside boxes, equipment, and panelboards.

G. Clean conductor surfaces before installing lugs and connectors.

H. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.

I. Use split bolt connectors for copper conductor splices and taps, 6 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.

J. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.

K. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 8 AWG and smaller.

L. Identify and color code wire and cable under provisions of Section 16075. Identify each conductor with its circuit number or other designation indicated.

M. Conductor Connections:

1. Where sire sizes larger than catalogue terminal size must be connected to wiring devices, safety switches, or branch circuit breakers as install a short length of the largest size conductor which fits the device terminal and connect to this conductor the branch wiring conductor, with connectors hereinbefore specified. Contact area between the two conductors shall be at least twice the cross section area of the larger conductor. Provide oversized boxes as required for this installation.

2. Contact area between the two conductors shall be at least twice the cross section are of the larger conductor.

3. Provide oversized boxes are required for this installation.

3.04 FIELD QUALITY CONTROL

A. Perform field inspection and testing.

B. Inspect and test in accordance with NETA STD ATS, except Section 4.

C. Perform inspections and tests listed in NETA STD ATS, Section 7.3.2.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Conduit, fittings, accessories and conduit bodies.

1.02 RELATED SECTIONS

A. Section 16060 - Grounding and Bonding.

B. Section 16070 - Hangers and Supports.

C. Section 16075 - Electrical Identification.

D. Section 16138 - Boxes.

1.03 REFERENCES

A. ANSI C80.1 - American National Standard Specification for Rigid Steel Conduit -- Zinc Coated.

B. ANSI C80.3 - American National Standard Specification for Electrical Metallic Tubing -- Zinc Coated.

C. ANSI C80.5 - American National Standard Specification for Rigid Aluminum Conduit.

D. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association.

E. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); National Electrical Contractors Association; 2001.

F. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies; National Electrical Manufacturers Association.

G. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit; National Electrical Manufacturers Association.

H. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing; National Electrical Manufacturers Association.

I. NFPA 70 - National Electrical Code; National Fire Protection Association.

1.04 SUBMITTALS

A. See Section 16010 for submittals procedures.

B. Product Data: Provide for metallic conduit, flexible metal conduit, liquidtight flexible metal conduit, metallic tubing, nonmetallic conduit, flexible nonmetallic conduit, fittings, and conduit bodies.

C. Project Record Documents: Accurately record actual routing of conduits larger than 2 inches (51 mm).

1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Accept conduit on site. Inspect for damage.

B. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

C. Protect PVC conduit from sunlight.

PART 2 PRODUCTS

2.01 CONDUIT REQUIREMENTS

A. Conduit Size: Comply with NFPA 70.
   1. Minimum Size: 1/2 inch (13 mm) unless otherwise specified.

B. Underground Installations:
   1. Use painted or plastic coated rigid steel, or thickwall non-metallic conduit (where allowed by codes).

   2. Concrete encase (minimum 4") non-metallic conduit may used for electrical or signal service entrances as allowed by code.

   3. Minimum Size: 3/4 inch (19 mm).

C. Outdoor Locations Above Grade: Use rigid steel conduit, rigid aluminum conduit, or intermediate metal conduit.

D. In Slab Above Grade:
   1. Use rigid steel conduit or intermediate metal conduit.

   2. Maximum 1" size conduit in slab.

E. Wet and Damp Locations: Use rigid steel conduit, rigid aluminum conduit, or intermediate metal conduit.

F. Dry Locations: Use rigid steel conduit, rigid aluminum conduit, intermediate metal conduit or Electrical Metallic Tubing. Flexible metal conduit may be used for branch circuits where allowed by codes and ordinances.

G. Exposed below 6'-0" AFF: Use rigid steel or intermediate metal conduit.

2.02 METAL CONDUIT

A. Manufacturers:
   1. Allied Tube & Conduit.

2. Beck Manufacturing, Inc.

3. Wheatland Tube Company.

B. Rigid Steel Conduit: ANSI C80.1.

C. Rigid Aluminum Conduit: ANSI C80.5.

D. Intermediate Metal Conduit (IMC): Rigid steel.

E. Fittings and Conduit Bodies: NEMA FB 1; material to match conduit, threaded fittings.

2.03 PVC COATED METAL CONDUIT

A. Manufacturers:
1. Allied Tube & Conduit.

2. OCAL Inc.

3. Robroy Industries.

B. Description: NEMA RN 1; rigid steel conduit with external PVC coating, 20 mil (0.05 mm) thick.

C. Fittings and Conduit Bodies: NEMA FB 1; steel fittings with external PVC coating to match conduit.

2.04 FLEXIBLE METAL CONDUIT

A. Manufacturers:
1. AFC Cable Systems, Inc.

2. Electri-Flex Company.

3. Greenfield.

B. Description: Interlocked steel construction.

C. Fittings: NEMA FB 1, malleable iron.

2.05 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

A. Manufacturers:
1. AFC Cable Systems, Inc: www.afcweb.com.

2. Electri-Flex Company.

3. International Metal Hose.

B. Description: Interlocked steel construction with PVC jacket.

C. Fittings: NEMA FB 1.

2.06 ELECTRICAL METALLIC TUBING (EMT)

A. Manufacturers:
   1. Allied Tube & Conduit.
   2. Beck Manufacturing, Inc.
   3. Wheatland Tube Company.

2.07 NONMETALLIC CONDUIT

A. Manufacturers:
   1. AFC Cable Systems, Inc.
   2. Electri-Flex Company.
   3. International Metal Hose.
B. Description: NEMA TC 2; Schedule 40 PVC.
C. Fittings and Conduit Bodies: NEMA TC 3.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as shown on drawings.
B. Verify routing and termination locations of conduit prior to rough-in.
C. Conduit routing is shown on drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

3.02 INSTALLATION

A. Install conduit securely, in a neat and workmanlike manner, as specified in NECA 1.
B. Install steel conduit as specified in NECA 101.
C. Install nonmetallic conduit in accordance with manufacturer's instructions.
D. Arrange supports to prevent misalignment during wiring installation.
E. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
F. Group related conduits; support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional conduits.
G. Fasten conduit supports to building structure and surfaces under provisions of Section 16070.
H. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.
I. Do not attach conduit to ceiling support wires.

J. Arrange conduit to maintain headroom and present neat appearance.

K. Route exposed conduit parallel and perpendicular to walls.

L. Route conduit installed above accessible ceilings parallel and perpendicular to walls.

M. Route conduit in and under slab from point-to-point.

N. Maintain adequate clearance between conduit and piping.

O. Maintain 12 inch (300 mm) clearance between conduit and surfaces with temperatures exceeding 104 degrees F (40 degrees C).

P. Cut conduit square using saw or pipe cutter; de-burr cut ends.

Q. Bring conduit to shoulder of fittings; fasten securely.

R. Use conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations.

S. Install no more than equivalent of three 90 degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use hydraulic one shot bender to fabricate bends in metal conduit larger than 2 inch (50 mm) size.

T. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.

U. Provide suitable fittings to accommodate expansion and deflection where conduit crosses expansion joints. Install exterior bonding jumpers for each conduit crossing.

V. Provide suitable pull string in each empty conduit except sleeves and nipples.

W. Use suitable caps to protect installed conduit against entrance of dirt and moisture.

X. All motors, other rotating equipment and transformers shall be connected to the conduit system by the use of a section of flexible conduit not less than 12" nor more than 24" in length. This flexible connection shall be furnished for both power and control wire.

Y. All recessed light fixtures shall be connected to the rigid conduit system with flexible conduit not less than 48" or more than 72".

Z. All rigid metallic conduits shall be equipped with double lock nuts and molded plastic insulated bushings where such conduits enter sheet metal construction such as panelboards, wireways, cabinets, pullboxes, junction boxes and other race-ways. Install grounded type insulated bushings where specified. All rigid metallic conduits terminating into pressed steel boxes shall be installed with insulated throat.

AA. In each finished space, furnish a chromium plated sectional escutcheon on each conduit or hanger rod penetrating a wall, floor or ceiling. Escutcheons shall be size to fit snugly to all lines. Where required, these plates shall be provided with set screws so that they shall fit snugly against the finished surface.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall and ceiling outlet boxes.

B. Floor boxes.

C. Pull and junction boxes.

1.02 RELATED SECTIONS

A. Section 07840 - Firestopping.

B. Section 16139 - Cabinets and Enclosures.

C. Section 16140 - Wiring Devices: Wall plates in finished areas.

1.03 REFERENCES

A. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association.

B. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies; National Electrical Manufacturers Association.

C. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; National Electrical Manufacturers Association.

D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); National Electrical Manufacturers Association.

E. NFPA 70 - National Electrical Code; National Fire Protection Association.

1.04 SUBMITTALS

A. See Section 16010 for submittal procedures.

1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Products: Provide products listed and classified by Underwriters Laboratories, Inc., as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Appleton Electric.

B. Arc-Co./Division of Arcade Technology.

C. Unity Manufacturing.

D. Hubbell.

E. Steel City.

F. Walker.

2.02 OUTLET BOXES

A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
   1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 1/2 inch (13 mm) male fixture studs where required.

   2. Concrete Ceiling Boxes: Concrete type.

B. Cast Boxes: NEMA FB 1, Type FD, cast feralloy. Provide gasketed cover by box manufacturer. Provide threaded hubs.

C. Wall Plates for Finished Areas: As specified in Section 16140.

2.03 PULL AND JUNCTION BOXES

A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

B. Hinged Enclosures: As specified in Section 16139.

C. Surface Mounted Cast Metal Box: NEMA 250; flat-flanged, surface mounted junction box:
   1. Material: Galvanized cast iron.

   2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.

D. In-Ground Cast Metal Box: NEMA 250, Type 6, outside flanged, recessed cover box for flush mounting:
   1. Material: Galvanized cast iron.

   2. Cover: Smooth cover with neoprene gasket and stainless steel cover screws.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify locations of floor boxes and outlets in offices and work areas prior to rough-in.

B. Refer to "Wiring Devices" for mounting height of specific type outlets.

3.02 INSTALLATION

A. Install boxes securely, in a neat and workmanlike manner, as specified in NECA 1.

B. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and as required by NFPA 70.

C. Coordinate installation of outlet boxes for equipment being connected.

D. Electrical boxes are shown on Drawings in approximate locations unless dimensioned.
   1. Adjust box locations up to 10 feet (3 m) if required to accommodate intended

purpose.

E. Orient boxes to accommodate wiring devices oriented as specified in Section 16140.

F. Maintain headroom and present neat mechanical appearance.

G. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.

H. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches (150 mm) from ceiling access panel or from removable recessed luminaire.

I. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07840.

J. Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes.

K. Locate outlet boxes to allow luminaires positioned as shown on reflected ceiling plan.

L. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

M. Use flush mounting outlet box in finished areas.

N. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

O. Do not install flush mounting box back-to-back in walls; provide minimum 6 inches (150 mm) separation. Provide minimum 24 inches (600 mm) separation in acoustic rated walls.

P. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.

Q. Use stamped steel bridges to fasten flush mounting outlet box between studs.

R. Use adjustable steel channel fasteners for hung ceiling outlet box.

S. Do not fasten boxes to ceiling support wires.

T. Support boxes independently of conduit.

U. Use gang box where more than one device is mounted together. Do not use sectional box.

V. Use cast outlet box in exterior locations exposed to the weather and wet locations.

W. Use cast floor boxes for installations in slab on grade; formed steel boxes are acceptable for other installations.

X. Set floor boxes level.

3.03 ADJUSTING

A. Adjust floor boxes flush with finish flooring material.

B. Adjust flush-mounting outlets to make front flush with finished wall material.

C. Install knockout closures in unused box openings.

3.04 CLEANING

A. Clean interior of boxes to remove dust, debris, and other material.

B. Clean exposed surfaces and restore finish.

END OF SECTION

SECTION 16140 - WIRING DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall switches.

B. Receptacles.

C. Device plates and decorative box covers.

D. Floor box service fittings.

E. Photo Electric Control.

F. Electric Time Switch.

1.02 RELATED SECTIONS

A. Section 16138 - Boxes.

1.03 REFERENCES

A. NECA 1 - Standard Practices for Good Workmanship in Electrical Contracting; National Electrical Contractors Association.

B. NEMA WD 1 - General Requirements for Wiring Devices; National Electrical Manufacturers Association.

C. NEMA WD 6 - Wiring Device -- Dimensional Requirements; National Electrical Manufacturers Association.

D. NFPA 70 - National Electrical Code; National Fire Protection Association.

1.04 SUBMITTALS

A. See Section 16010 for submittal procedures.

B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

C. Manufacturer's Installation Instructions.

1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Products: Provide products listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 WALL SWITCHES

A. MANUFACTURERS
   1. Arrow Hart
   2. GE Wiring Devices
   3. Leviton
   4. Hubbell
   5. Pass & Seymore

B. Wall Switches: Heavy Duty, AC only general-use snap switch, complying with NEMA WD 6 and WD 1.
   1. Body and Handle: plastic (color as selected by architect) with rocker handle.
   2. Indicator Light: Lighted handle type switch; red handle.
   3. Ratings:
      a. Voltage: 120 - 277 volts, AC.
      b. Current: 20 amperes.
   4. Similar to Pass & Seymore:
      a. Single Pole - Series CS12
      b. Two Pole - Series CS22
      c. Three Way - Series CS32
      d. Four Way - Series CS42
      e. Pilot Light - 20AC-RP
      f. Momentary - 1250
      g. Manual Thermal - 20 AC2-H
      h. Occupancy sensor - Watt Stopper #WA-100

2.02 RECEPTACLES

A. MANUFACTURERS
   1. Arrow Hart
   2. GE Wiring Devices
   3. Leviton
   4. Hubbell

5. Pass & Seymore

B. Receptacles: Heavy duty, complying with NEMA WD 6 and WD 1.
   1. Device Body: plastic (color as selected by architect).
   2. Configuration: NEMA WD 6, type as specified and indicated.

C. Convenience Receptacles: Type 5 - 20.

D. GFCI Receptacles: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements.

E. Similar to Pass & Seymore:
   1. Single - 5351
   2. Duplex - 5352
   3. Clock - S371
   4. GFCI - 2091
   5. IG - IG6300
   6. Tamper Resistant - TR62

2.03 WALL PLATES

A. Device Cover Plates: smooth plastic (color as selected by architect).

B. Weatherproof Cover Plates: Die-cast weatherproof covers spring loaded to automatically close when plug cap is removed, heavy neoprene gasket, and four screw "FS" box mounting listed for damp and wet locations. Shall be similar to Leviton weather resistant covers for switch, receptacle, and special outlets. For wet locations, i.e., rooftops or exterior noncovered receptacles, provide weatherproof covers with self-closing lid that remains raintight when cord is inserted per UL 410-57(b). Shall be GFCI opening, Leviton 5990 series.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install securely, in a neat and workmanlike manner, as specified in NECA 1.

B. Install devices plumb and level.

C. Install switches with OFF position down.

D. Install receptacles with grounding pole on top.

E. Connect wiring device grounding terminal to outlet box with bonding jumper.

F. Connect wiring devices by wrapping conductor around screw terminal.

G. Unless noted to the contrary on drawings or directed other-wise during the progress of the work, all wiring devices shall be mounted at the height to center of device listed as follows:

1. Switches 48" above finished floor

2. Receptacles 18" above finished floor

3. Wall telephone outlets 18" above finished floor

4. Where noted (AC) 6" above countertops or lavatories

5. Light switches shall be installed on the strike side of doors as actually hung; advise Architect where drawings contradict

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Luminaires and accessories.

B. Emergency lighting units.

C. Exit signs.

D. Ballasts.

E. Fluorescent dimming ballasts and controls.

F. Fluorescent lamp emergency power supply.

G. Lamps.

H. Luminaire accessories.

1.02 REFERENCES

A. ANSI C78.379 - American National Standard for Electric Lamps -- Reflector Lamps -- Classification of Beam Patterns.

B. ANSI C82.1 - American National Standard Specifications for Fluorescent Lamp Ballasts.

C. ANSI C82.4 - American National Standard for Ballasts for High-Intensity-Discharge and Low Pressure Sodium Lamps (Multiple-Supply Type).

D. NECA/IESNA 500 - Recommended Practice for Installing Indoor Commercial Lighting Systems; National Electrical Contractors Association; 1998.

E. NECA/IESNA 502 - Recommended Practice for Installing Industrial Lighting Systems; National Electrical Contractors Association; 1999.

F. NEMA WD 6 - Wiring Devices - Dimensional Requirements; National Electrical Manufacturers Association.

G. NFPA 70 - National Electrical Code; National Fire Protection Association.

H. NFPA 101 - Code for Safety to Life from Fire in Buildings and Structures; National Fire Protection Association.

1.03 SUBMITTALS

A. See Section 16010 for submittal procedures.

B. Shop Drawings: Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.

C. Product Data: Provide dimensions, ratings, and performance data.

D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Quality

Assurance. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

E. Operation and Maintenance Data: Instructions for each product.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70 and NFPA 101.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

1.05 EXTRA MATERIALS

A. See Section 01600 - Product Requirements, for additional provisions.

B. Furnish two of each plastic lens type.

C. Furnish one replacement lamps for each lamp type.

D. Furnish two of each ballast type.

PART 2 PRODUCTS

2.01 LUMINAIRES

A. Furnish products as indicated in Schedule included on the Drawings.

B. The light fixture schedule on the drawings describes the fixtures to be used, and lists the manufacturer and catalog number. Comparable items by other manufacturers will be considered if complete information including photometric data is submitted.

C. All lighting fixtures for recessed installation shall be furnished with proper thermal cutouts as required by the National Electric Code and shall bear applicable UL labels indicating suitability for a recessed installation as required for each individual application.

2.02 BALLASTS AND CONTROL UNITS

A. HID Ballasts:
   1. Ballasts for high intensity discharge lamps, unless otherwise scheduled, shall be high power factor and manufactured in accordance with CBM Standards, ETL certified, and UL approved.

   2. Built-in thermal protection shall be provided of sizes and types in which this feature is available.

B. Fluorescent Ballasts:
   1. Ballasts for fluorescent lamps, unless otherwise scheduled, shall be integrated circuit design electronic type and manufactured in accordance with CBM Standards, ETL certified, and UL listed Class P.

2. Ballasts shall be instant start type for paralled lamp operation with an input current total harmonic distortion not to exceed 20%.

C. Fluorescent Lamp Emergency Power Supply: Emergency battery power supply suitable for installation in ballast compartment of fluorescent luminaire.
1. Lamp Ratings: One F40CW lamp providing 600 lumens, minimum.

2. Battery: Sealed lead calcium type, rated for 10 year life.

3. Include TEST switch and AC ON indicator light, installed to be operable and visible from the outside of an assembled luminaire.

D. Approved Manufacturers:
1. Universal

2. Valmont

3. Magnetek

4. Motorola

5. Advance

2.03 LAMPS

A. Lamp Types: As specified for each luminaire.

B. All lamps used on this project shall be new, shall be delivered to the job site in the original packing cases and sleeves, and shall be of the same manufacturer.

C. Fluorescent lamp color shall be standard 3500°K unless otherwise noted on plans and shall be energy efficient type compatable with ballast.

D. Incandescent lamps shall be 130 volt inside frost unless noted.

E. High intensity discharge lamps shall be as recommended by the fixture manufacturer.

F. Approved Manufacturers:
1. General Electric

2. Oshram Sylvania

PART 3 EXECUTION

3.01 INSTALLATION

A. Install fixtures securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting).

B. Install suspended luminaires and exit signs using pendants supported from swivel hangers. Provide pendant length required to suspend luminaire at indicated height.

C. Support luminaires independent of ceiling framing.

D. Locate recessed ceiling luminaires as indicated on reflected ceiling plan.

E. Install surface mounted luminaires and exit signs plumb and adjust to align with building lines and with each other. Secure to prevent movement.

F. Exposed Grid Ceilings: Support surface mounted luminaires in grid ceiling directly from building structure.

G. Install recessed luminaires to permit removal from below.

H. Install recessed luminaires using accessories and firestopping materials to meet regulatory requirements for fire rating.

I. Install clips to secure recessed grid-supported luminaires in place.

J. Install wall mounted luminaires, emergency lighting units, and exit signs at height as indicated on Drawings.

K. Install accessories furnished with each luminaire.

L. Connect luminaires and exit signs to branch circuit outlets provided using flexible conduit.

M. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.

N. Bond products and metal accessories to branch circuit equipment grounding conductor.

O. Install specified lamps in each emergency lighting unit, exit sign, and luminaire.

P. Interface with air handling accessories furnished and installed under Division 15000.

Q. Electrical drawings show approximate locations of fixtures; however, the Architect shall have final authority as to exact location. Changes in location by the Architect (if prior to rough-in) shall not be subject to extra payment.

R. It shall be the contractor's responsibility to check the architectural finishes and, regardless of the catalog number prefixes and suffixes shown, furnish fixtures with the proper trim, frames, supports and hangers, and other miscellaneous appurtenances, to properly coordinate with said finishes.

S. Where ceiling construction requires reinforcing to support the weight of the fixtures, it shall be furnished by this contractor.

T. Exit lights shall be positioned so as to be continuously visible along the entire egress path as required by code.

3.02 FIELD QUALITY CONTROL

A. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

3.03 ADJUSTING

A. Aim and adjust luminaires as indicated.

B. Position exit sign directional arrows as indicated.

3.04 CLEANING

A. Clean electrical parts to remove conductive and deleterious materials.

B. Remove dirt and debris from enclosures.

C. Clean photometric control surfaces as recommended by manufacturer.

D. Clean finishes and touch up damage.

3.05 PROTECTION

A. Relamp luminaires that have failed lamps at Substantial Completion.

END OF SECTION